Examining a Novel Method of Earnings Management During Inventory Investment Reduction and Its Relationship with Firm Size and Life Cycle Through the Adjustment of the Modern Capital Structure Theory in the Tehran Stock Exchange and Iran Over-the-Counter

Ali Basati[1], Emad Rezaei[2*], Kaveh Azinfar[3], Hamid Reza Gholamnia Roshan[4]

[1] PhD Student, Department of Accounting, Babol Branch, Islamic Azad University, Babol, Iran.
[2] Assistant Professor, Department of Accounting, Babol Branch, Islamic Azad University, Malayer, Iran (Corresponding Author).
[3] Assistant Professor, Department of Accounting, Babol Branch, Islamic Azad University, Babol, Iran.
[4] Assistant Professor, Department of Accounting, Babol Branch, Islamic Azad University, Babol, Iran.

*** Corresponding author email address**: rezaei.emad@gmail.com

Received: 2025-02-02 **Reviewed:** 2025-02-16 **Revised:** 2025-03-03 **Accepted:** 2025-03-16 **Published:** 2025-05-04

Abstract

Previous research has not examined earnings management during inventory investment reduction, nor the impact of capital structure on managed and unmanaged performance. Therefore, the main objective of this study is to investigate novel methods of earnings management during reductions in inventory investment using discretionary and non-discretionary accruals, and to divide performance into two components: (1) managed performance, where the manager has the ability to employ discretionary accruals, and (2) unmanaged performance, where the manager lacks the ability to utilize discretionary accruals. Subsequently, we examined the level of insignificance, which indicates the adjustment of capital structure theories in favor of managers' opportunistic earnings management. The statistical sample of this research includes 173 companies listed on the Tehran Stock Exchange and Iran Over-the-Counter. The research findings indicate a significant positive relationship between risk, liquidity, and firm size 2, and a negative relationship between leverage and both managed and unmanaged performance. Consequently, due to the lack of a significant relationship between inventory investment, firm size 1, and firm life cycle with managed and unmanaged performance, this indicates that an adjustment has occurred in the capital structure theory, representing opportunistic earnings management. A comparison of the managed and unmanaged performance models in this study revealed that in Iranian firms, when inventory investment decreases, managers reduce liquidity through discretionary accruals, and present firm size 1, firm life cycle, and operational history as increased, and firm size 2 as decreased, to engage in opportunistic earnings management.

Keywords: *Adjustment of the Modern Capital Structure Theory, Inventory Investment, Firm Size, Firm Life Cycle, Earnings Management.*

How to cite this article:

Basati, A., Rezaei, E., Azinfar, K., Gholamnia Roshan, H.R. (2025). Examining a Novel Method of Earnings Management During Inventory Investment Reduction and Its Relationship with Firm Size and Life Cycle Through the Adjustment of the Modern Capital Structure Theory in the Tehran Stock Exchange and Iran Over-the-Counter. Management Strategies and Engineering Sciences, 7(5), 24-38.

1. Introduction

The classic capital structure theories—pecking order, trade-off, and agency theories—each offer valuable insights into firm behavior. According to the pecking order theory, firms prioritize internal financing and view debt as a secondary option only when retained earnings are insufficient. This model attributes financing decisions to asymmetric information and managerial preferences to avoid external scrutiny [1, 2]. In contrast, the trade-off theory argues for an optimal capital structure balancing the tax advantages of debt against the costs of financial distress [3, 4]. Agency theory further explains that debt can act as a governance tool by limiting managerial discretion and reducing agency costs [5, 6].

However, empirical findings have often been inconsistent due to differences in economic settings, firm characteristics, and methodological approaches. For instance, while Abor (2005) finds a negative relationship between leverage and firm performance in Ghana, he also reports a positive relationship for SMEs, emphasizing the role of firm size and sector [7, 8]. Similarly, Ebaid (2009) observes that capital structure has limited impact on the performance of Egyptian firms, suggesting context-dependent relationships [9]. This divergence highlights the need to investigate these dynamics in more granular settings—such as when firms engage in earnings management during inventory investment reductions.

Earnings management, often operationalized through discretionary accruals, is a central concern in financial reporting. Managers may manipulate earnings to meet financial benchmarks, influence stock prices, or satisfy debt covenants [10, 11]. The distinction between managed (ROA) and unmanaged (NDROA) performance models allows researchers to isolate the effects of discretionary actions from the firm's fundamental performance. For example, Rahman et al. (2021) demonstrate how managerial access to inside information can influence trading behavior, which is closely tied to the manipulation of reported earnings [12].

Inventory investment, in particular, offers a fertile ground for earnings management. Reducing inventory investment provides an opportunity to reallocate resources, manipulate accruals, and strategically influence reported earnings without necessarily altering core operational activities. Sohailifar et al. (2020) argue that deviations from optimal capital structure often correlate with inefficient investment behaviors, including inventory decisions [13]. Similarly, Gan et al. (2021) note that the speed of capital structure adjustment varies across business cycles, indicating that firms adapt their financial strategies—including earnings management—based on macroeconomic conditions [14].

The literature has also emphasized the role of firm-specific attributes such as size, liquidity, and longevity. Larger firms generally have more access to capital markets and lower information asymmetry, enabling them to maintain more stable capital structures [15, 16]. Conversely, smaller firms may rely more heavily on short-term debt, exposing them to greater risks during periods of constrained cash flow [17]. Liquidity also plays a significant role; firms with higher liquidity may delay financing decisions or manipulate accruals to appear financially robust [18, 19].

In this context, analyzing the impact of capital structure on both discretionary (ROA) and non-discretionary (NDROA) performance becomes essential for understanding the strategic use of earnings management. Mubeen et al. (2020) suggest that CEO characteristics and market competition can influence capital structure decisions and earnings manipulation, reinforcing the need to account for managerial behavior in such models [20]. Additionally, the presence of earnings management often signals deeper governance issues, as indicated by recent meta-analytical studies on corporate social responsibility and reporting practices [10].

The Iranian capital market provides a compelling setting for this investigation. As a developing market with unique institutional characteristics, it presents a different set of incentives and constraints for managers. Aflatuni and Bakhtiari (2017) emphasize that disclosure quality and accrual quality are crucial in aligning firms closer to their optimal capital structure, especially in environments where external monitoring is limited [21]. Similarly, Nazari Ardabili et al. (2024) highlight the importance of institutional maturity and policy frameworks in shaping financial behavior in Iranian firms [22].

Moreover, recent studies on capital structure behavior across business cycles and industries reveal that firms do not passively adhere to theoretical expectations. Indomo and Lubis (2023) find that Indonesian property developers adjust their leverage dynamically based on market conditions, illustrating that capital structure is not static but responsive to strategic and contextual factors [23]. In line with this, Ugur et al. (2022) argue that firms facing high competition and agency costs often exhibit higher financial distress risks, which can distort their capital structure choices and increase the likelihood of earnings manipulation [24].

This study aims to bridge these conceptual and empirical gaps by examining the relationship between capital structure and firm performance through the lens of earnings management. Specifically, it investigates how firms behave during inventory investment reductions and whether such behavior reflects opportunistic earnings management. By comparing ROA (managed performance) and NDROA (unmanaged performance), the study provides a nuanced understanding of how discretionary accruals mediate the relationship between financial structure and performance outcomes.

Additionally, the analysis considers the moderating roles of liquidity, firm size, and age. As highlighted by Kim et al. (2023), managerial ability significantly influences earnings responses, especially in environments with high uncertainty or limited regulatory oversight [25]. In this light, examining whether managers in Iranian firms opportunistically manage earnings to portray stability or growth becomes highly relevant. Shamsad (2023) also emphasizes the role of leverage in amplifying financial distress risks, especially when firms prioritize short-term gains over long-term sustainability [26].

In summary, this research makes several key contributions. First, it disentangles the effects of discretionary and non-discretionary accruals on firm performance, allowing a more precise evaluation of capital structure theories in practice. Second, it introduces inventory investment reduction as a contextual variable influencing earnings management decisions. Third, it situates the analysis within a developing market context, offering insights applicable to similar economies. Finally, by integrating firm-specific variables and adopting a comparative model approach, the study advances our understanding of how capital structure and earnings management interact under varying economic and organizational conditions.

2. Methodology

This study, in terms of research purpose, is an applied and correlational study. Its main objective is to examine a novel method of earnings management during inventory investment reduction and its relationship with firm size and life cycle, using the adjustment of the modern capital structure theory in the Tehran Stock Exchange and Iran Over-the-Counter. In terms of overall design, the study is post-event, and methodologically, it employs a novel capital structure model estimated using a new year-industry approach. Therefore, the findings of this model have significant implications for the impact of capital structure on firm performance—namely, both discretionary and non-discretionary performance. Accordingly, the general model of the study is specified as follows:

$$ROA_{it} = \beta_0 + \beta_1 (lev)_{it} + \beta_2 (\sigma ROA)_{it} + \beta_3 (LQ)_{it} + \beta_4 (IV)_{it} + \beta_5 (SG)_{it} + \beta_6 (SIZE1)_{it} + \beta_7 (SIZE2)_{it} + \beta_8 (Age)_{it} + \varepsilon_{it}$$

Performance is then divided into two categories: performance based on discretionary measures and performance based on non-discretionary measures. These are used to examine the research objectives.

In this model, firm performance, or Return on Assets (ROA), and Non-Discretionary Return on Assets (NDROA), are considered dependent variables to measure firms' financial performance. Meanwhile, a set of control variables with expected signs is used to measure their relationship with financial performance.

$$ROA_{it} = \beta_0 + \beta_1 (lev)_{it} + \beta_2 (\sigma ROA)_{it} + \beta_3 (LQ)_{it} + \beta_4 (IV)_{it} + \beta_5 (SG)_{it} + \beta_6 (SIZE1)_{it} + \beta_7 (SIZE2)_{it} + \beta_8 (Age)_{it} + \varepsilon_{it}$$

$$NDROA_{it} = \beta_0 + \beta_1 (lev)_{it} + \beta_2 (\sigma NDROA)_{it} + \beta_3 (LQ)_{it} + \beta_4 (IV)_{it} + \beta_5 (SG)_{it} + \beta_6 (SIZE1)_{it} + \beta_7 (SIZE2)_{it} + \beta_8 (Age)_{it} + \varepsilon_{it}$$

ROA is the financial performance of firm *i* at time *t*. β_0 is the regression intercept. lev is the leverage of firm *i* at time *t*. LQ is the liquidity of firm *i* at time *t*. IV is the inventory investment of firm *i* at time *t*. SG is the sales growth of firm *i* at time *t*. SIZE1 is the logarithm of total assets of firm *i* at time *t*. SIZE2 is the logarithm of total sales of firm *i* at time *t*. Age is the number of years from the firm's registration until the date of data collection. ε is the error term.

From a methodological standpoint, this study uses an efficient model such as panel data along with validity tests to address cross-sectional heteroscedasticity. The findings of this model have significant implications for the impact of capital structure on firm performance under both earnings management (discretionary) and non-management (non-discretionary) scenarios.

Variables

Earnings Management (Discretionary Earnings Management)

The literature on earnings management lacks a universally accepted definition of the term. Arthur Levitt, former Chairman of the U.S. Securities and Exchange Commission, defined earnings management as: “Earnings management is the act of making reported earnings reflect

the desires of management more than the company's underlying economic performance."

Performance

Performance is calculated in two ways. First, managed performance is based on total net income (including both discretionary and non-discretionary accruals) (NI). Second, unmanaged performance is based on non-discretionary net income (NDNI).

NI includes cash flow from operations and all types of accruals, including non-discretionary accruals (those not under managerial control or required for smooth operations) and discretionary accruals (those based on managerial judgment and not deemed necessary).

NDNI includes only cash flows from operations and non-discretionary accruals, while excluding discretionary accruals (Subramanyam, 1996).

NI = CFO + NDA + DA

NDNI = CFO + NDA

Various methods are used to distinguish between discretionary and non-discretionary accruals based on changes in accounting standards and capital structure. To estimate discretionary accruals, we apply the performance-matched modified Jones model (Kothari, Leone, & Wasley, 2005), which, unlike other accrual models, incorporates a performance criterion. The Kothari et al. (2005) model is as follows:

$$TAC\_it = \beta\_0 + \beta\_1 (1 / A\_it) + \beta\_2 (\Delta Revenue\_it - \Delta AccReceivable\_it) / A\_it + \beta\_3 (PPE\_it / A\_it) + \beta\_4 ROA\_it + v\_it$$

TAC refers to total accruals. AR is accounts receivable. PPE stands for property, plant, and equipment. A_it is total assets. All variables are scaled by total assets to reduce heteroscedasticity. The explained portion is considered non-discretionary accruals, while the residual is attributed to discretionary accruals. Discretionary accruals are identified as earnings management.

Based on the above discussion, two dependent variables are used:

1. Firm performance (ROA), calculated as net income after tax (NI) divided by total assets
2. Managed firm performance (NDROA), calculated as NDNI divided by total assets (Dechow et al., 1995, pp. 193–225)

Initially, each dependent variable is included in the model separately, and then the results are compared to determine whether the performance of capital structure is consistent across both ROA types.

Capital Structure Measurement

Harris and Raviv (1991) argue that the operational measure of leverage is a highly important explanatory variable because it affects the interpretation of results. Rajan and Zingales (1995) also demonstrate that the determinants of capital structure are sensitive to leverage as a metric.

Table 1. Research Model Variables

Variable Symbol	Variable Name	Variable Type	Calculation Description
ROA	Performance of firm *i* at time *t*	Dependent	Net income divided by total assets; prior studies use various measures of firm performance
NDROA	Non-discretionary return on assets of firm *i* at time *t*	Dependent	NDNI (including operating cash flow and non-discretionary accruals) divided by total assets
LEV	Capital structure (leverage)	Independent	Total debt divided by total assets
σROA	Unmanaged performance risk based on ROA	Control	Standard deviation of performance based on ROA
σNDROA	Managed performance risk based on NDROA	Control	Standard deviation of performance based on NDROA
LQ	Liquidity of firm *i* at time *t*	Control	Current assets divided by current liabilities
IV	Inventory investment of firm *i* at time *t*	Control	Inventory investment divided by total assets
SG	Sales growth of firm *i* at time *t*	Control	Change in sales compared to the previous year
SIZE2	Firm size 2 of firm *i* at time *t*	Control	Logarithm of total assets
AG	Firm age (life cycle) of firm *i* at time *t*	Control	Number of years since establishment up to data collection time

Scope of the Study

Topical Scope:

The present study measures the relationship between managed and unmanaged firm performance and the efficiency of capital structure for both types of performance separately to identify theoretical changes in capital structure. If all performance-related factors are not significant at the 5% level, this suggests that the theories of capital structure have been adjusted within each performance model, indicating opportunistic earnings management and managerial intervention in companies listed on the Tehran Stock Exchange and Iran Over-the-Counter.

Time Scope:

This study covers a 10-year period from 2013 to 2022

Geographical Scope:

The statistical data required were extracted from the financial statements of companies listed on the Tehran Stock Exchange and Iran Over-the-Counter.

Population and Sample of the Study

The statistical population of this study includes all companies listed on the Tehran Stock Exchange. The statistical sample is a subset of the population that represents its main characteristics. To ensure that the sample appropriately represents the population, the systematic elimination method was used. Six criteria were applied, and companies that met all the criteria were included in the sample, while others were excluded.

The target population includes all companies listed on the Tehran Stock Exchange from 2013 to 2021.

Sampling Method

The sampling method used in this study is systematic elimination, where the sample was selected from the population based on the following criteria:

1. Companies must have been listed on the Tehran Stock Exchange before 2013 and remained active through the end of 2022.
2. To enhance comparability, the company's fiscal year must end in March, and they must not have changed their fiscal year or business activity between 2013 and 2022.
3. Investment and financial intermediary firms (such as leasing companies, insurance firms, holdings, banks, and financial institutions) are excluded due to their unique reporting structures.
4. Companies must not have had trading suspensions exceeding six months.
5. Financial data for the period 2013–2022 must be available.
6. In each industry, at least 15 firms must have available data for the same period.

After applying all criteria, 173 companies remained as the screened population, all of which were included in the sample. Thus, the initial number of observations over the period 2013 to 2022 was 1730 (10 years × 173 companies). However, considering the conditions of the models used in this study, the final sample for the period 2015 to 2022 includes 1384 observations (8 years × 173 companies).

Data Collection Method:

In the present study, data collection was carried out using document-based and library methods. Literature and theoretical foundations were gathered from books, domestic and international journals, and online sources. Statistical data were collected from financial statements of companies listed on the Tehran Stock Exchange, using databases such as the official websites of the Tehran Stock Exchange, Rahavard Novin software, IRBourse, RDIS, Iran Analysis, and other reputable sources.

Outlier Data Editing:

Outliers were identified using the method proposed by Kiani, Rasoul, and Montazeri, Mojtaba (2015), using an empirical procedure in EViews 12 software via the following path: *View* > *Graph* > *Option Pages* > *Graph Type* > *Specific* > *Line-Symbol*. After identification, outliers were revised and removed accordingly.

3. Findings and Results

After examining the regression assumptions and multicollinearity, as shown in the following table, we proceed with descriptive and inferential statistics. The next section discusses and interprets the results.

Table 2. Examination of Regression Assumptions and Multicollinearity in ROA and NDROA Models Using Stata Software

Row	Assumption Name	Models	Method/Approach	Stata Command
1	Zero mean error term	ROA	After estimating the model by year and industry, the following command is entered	qui predict res1, res ttest res1=0
		NDROA		qui predict res1, res ttest res1=0
2	Homoscedasticity of error variance	ROA	Elmessih test using Wald's command	lmhwaldxt ROA LEV SDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)
		NDROA		lmhwaldxt NDROA LEV SDNDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)

3	No autocorrelation in error terms	ROA	Elmessih (Wooldridge) test	lmawxt ROA LEV SDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)
		NDROA		lmawxt NDROA LEV SDNDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)
4	No correlation between explanatory variables and errors	ROA	Since explanatory variables are exogenous (generated externally), and error terms are endogenous (internal to model), this assumption typically holds (Aflatooni, 2015, *Statistical Analysis in Financial and Accounting Research with Stata*, p. 98)	—
		NDROA		—
5	Normal distribution of error terms	ROA	Elmessih (White) test	lmnwhitext ROA LEV SDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)
		NDROA		lmnwhitext NDROA LEV SDNDROA LQ IV SG SIZ SIZ2 AG , id(firms) it(years)
6	Multicollinearity identification	ROA	1. Elmessih & Michael (2012) test 2. Correlation coefficients command	lmcol ROA LEV SDROA LQ IV SG SIZ SIZ2 AG correlate ROA LEV SDROA LQ IV SG SIZ SIZ2 AG
		NDROA		lmcol NDROA LEV SDNDROA LQ IV SG SIZ SIZ2 AG correlate NDROA LEV SDNDROA LQ IV SG SIZ SIZ2 AG

Table 3. Results of Regression Assumptions in ROA and NDROA Models Using Stata Software

Row	Assumption Name	Test Type	Test Statistic / Significance Level	ROA Result	NDROA Result
1	Zero mean error term	Student's t-test	pr(	T	>
			t-statistic significance level = 0	No problem with Assumption 1	No problem with Assumption 1
2	Homoscedasticity of error variance	Elmessih–Wald test	Wald test logE2 = X = 330.0216 (ROA)	Significant Wald statistic indicates violation	Significant Wald statistic indicates violation
			Wald test logE2 = X = 235.3422 (NDROA)	of homoscedasticity assumption	of homoscedasticity assumption
			p-value = 0.0000		
3	No autocorrelation in error terms	Elmessih (Wooldridge)	F-statistic = 66.1181 (ROA)	Significant F-statistic indicates autocorrelation	Significant F-statistic indicates autocorrelation
			F-statistic = 220.7847 (NDROA)	among error terms	among error terms
			p-value = 0.0000		
		Lagrange Multiplier (LM)	LM = 220.7847 (ROA)		
			LM = 175.3992 (NDROA)	p-value = 0.0000	p-value = 0.0000
4	No correlation between errors and predictors	Theoretical condition	Based on exogeneity of predictors	Assumption generally valid unless Assumption 1 fails	Assumption generally valid unless Assumption 1 fails
5	Normal distribution of error terms	Elmessih (White) test	White LM = 535.536 (ROA)	Significant result indicates non-normality	Significant result indicates non-normality
			White LM = 206.0567 (NDROA)	of error term distribution	of error term distribution
			p-value = 0.0000		
6	Multicollinearity check	Elmessih & Michael (2012) and correlation matrix	Commands executed in Stata	No multicollinearity problem	No multicollinearity problem

The results of the classical regression assumptions and multicollinearity analysis are presented as follows:

1. **The Mean of the Error Term is Zero:** This assumption is generally not tested explicitly; however, after estimating the model, residuals were extracted and analyzed using the Student's t-test. The nonsignificant result of the test (mean = 0) indicates that the mean of the error term in both the ROA and NDROA models does not significantly differ from zero. This supports the validity of the first classical assumption of regression.
2. **The Error Term Has Constant Variance (Homoscedasticity):** To test for homoscedasticity in panel data, three main approaches are generally used. In this article, we employed the series of tests introduced by Elmessih (2015 and 2016). The significance of the Wald statistic in both the ROA and NDROA models indicates rejection of the null hypothesis, thus suggesting the presence of heteroscedasticity in the model's error term.
3. **There is no autocorrelation among the error terms**
4. **No Correlation Between the Error Term and Explanatory Variables:** Since the values of explanatory variables are externally generated (exogenous) and the values of the error term arise from within the model (endogenous), this assumption is typically satisfied. One of the reasons for potential violation of this assumption may be the failure of the first assumption (zero mean error). This is noted in *Statistical Analysis in Financial and Accounting Research with Stata*.
5. **The Error Term is Normally Distributed:** The significance of the White test statistic in both the ROA and NDROA models leads to the rejection of the null hypothesis, indicating that the regression error term does not follow a normal distribution. However, as explained in *Statistical Analysis in Financial and Accounting Research with Stata*, given that other classical assumptions are met and the sample size is sufficiently large, the lack of normality in residuals is not a major concern.
6. **Multicollinearity Check:** Multicollinearity was examined using the lmcol command. The first part of this command generates a correlation matrix of the independent variables. The second part evaluates multicollinearity using six criteria, the most well-known of which are the Variance Inflation Factor (VIF) and its reciprocal, the tolerance index. The ideal value for VIF is 1; however, values less than 10 are generally considered acceptable and suggest no serious multicollinearity. Similarly, a tolerance value of 1 is optimal, and values greater than 0.1 (or in some sources, 0.2) also indicate the absence of strong multicollinearity among independent variables. Examination of the output table confirms that there is no multicollinearity issue in this study.

In continuation of this study, the results of the descriptive and inferential statistics are presented in the following tables.

Table 4. Descriptive Statistics for ROA (Discretionary Performance) and NDROA (Unmanaged Performance) Using Stata Software

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	1,384	0.1482806	0.1891443	-0.2981809	0.6372043
NDROA	1,384	0.147771	0.206177	-0.2880176	0.6838208
LEV	1,384	0.5879226	0.4080373	0.0521631	2.61648
SDROA	1,384	0.0600758	0.0539239	0.0015952	0.2475875
SDNDROA	1,384	0.0783273	0.0566237	0.0096006	0.2747827
LQ	1,384	1.817826	1.649135	0.1642663	9.854072
IV	1,384	0.3235876	0.1875296	0	0.7652441
SIZ	1,384	6.647371	0.7431575	5.188253	8.438396
SIZ2	1,384	6.159063	1.750169	0	8.515484
AG	1,384	19.98988	9.195863	5	46

Given the issues of heteroscedasticity and serial correlation in the regression error terms identified during the classical regression assumption tests, we corrected these issues using the following Stata commands:

1. For the ROA model:
2. reg ROA LEV SDROA LQ IV SIZ SIZ2 AG i.years, vce(cluster firms)
3. For the NDROA model:
4. reg NDROA LEV SDNDROA LQ IV SIZ SIZ2 AG i.years, vce(cluster firms)

The model estimation results, after controlling for year and industry effects and correcting for heteroscedasticity and serial correlation in the error terms, are presented in tables below.

Table 5. Model Summary for ROA (Discretionary Performance) Estimated with Year and Industry Effects

Statistic	Value
Number of observations	1,384
F-statistic (20, 172)	46.34
Prob > F	0.0000
R-squared	0.5923
Root MSE	0.12165

Table 6. Regression Coefficients for ROA Model (Discretionary Performance)

Variable	Coefficient	Std. Error	t	p > t	95% Confidence Interval
LEV	-0.1994	0.0219	-9.11	0.000	-0.2425 to -0.1562
SDROA	0.5665	0.1520	3.73	0.000	0.2664 to 0.8666
LQ	0.0257	0.0066	3.89	0.000	0.0127 to 0.0388
IV	-0.0281	0.0384	-0.73	0.465	-0.1039 to 0.0477
SIZ	0.0051	0.0125	0.41	0.685	-0.0196 to 0.0298
SIZ2	0.0259	0.0076	3.39	0.001	0.0108 to 0.0410
AG	-0.0008	0.0006	-1.28	0.204	-0.0020 to 0.0004
Industry 2	-0.1285	0.0258	-4.97	0.000	-0.1795 to -0.0775
Industry 3	-0.0620	0.0260	-2.39	0.018	-0.1133 to -0.0107
Industry 4	0.0103	0.0275	0.37	0.710	-0.0441 to 0.0646
Industry 5	0.0240	0.0306	0.78	0.434	-0.0364 to 0.0845
Industry 6	-0.0667	0.0291	-2.29	0.023	-0.1241 to -0.0092
Industry 7	-0.0301	0.0323	-0.93	0.352	-0.0939 to 0.0336
Year 2016	0.0000	0.0061	0.01	0.995	-0.0119 to 0.0120
Year 2017	0.0142	0.0080	1.77	0.078	-0.0016 to 0.0301
Year 2018	0.0402	0.0096	4.17	0.000	0.0212 to 0.0592
Year 2019	0.0515	0.0118	4.36	0.000	0.0282 to 0.0748
Year 2020	0.1010	0.0167	6.03	0.000	0.0679 to 0.1340
Year 2021	0.0699	0.0174	4.03	0.000	0.0356 to 0.1041
Year 2022	0.0648	0.0197	3.29	0.001	0.0260 to 0.1037
Constant	0.0122	0.0886	0.14	0.891	-0.1627 to 0.1871

Table 7. Estimation of the NDROA Model (Unmanaged Performance) with Year and Industry Effects in Stata, Adjusted for Heteroscedasticity and Serial Correlation, Including Separate Calculation of F-statistics and Prob(F)

Statistic	Value
Number of observations	1,384
F(20, 172)	27.88
Prob > F	0.0000
R-squared	0.4677
Root MSE	0.15152

Table 8. Regression Coefficients for NDROA Model (Unmanaged Performance)

Variable	Coefficient	Std. Error	t	p > t	95% Confidence Interval
LEV	-0.1702	0.0256	-6.65	0.000	-0.2206 to -0.1197
SDNDROA	0.6629	0.1383	4.79	0.000	0.3899 to 0.9359
LQ	0.0255	0.0077	3.30	0.001	0.0102 to 0.0407
IV	-0.0306	0.0431	-0.71	0.478	-0.1157 to 0.0545
SIZ	0.0115	0.0155	0.74	0.460	-0.0191 to 0.0422
SIZ2	0.0283	0.0092	3.08	0.002	0.0102 to 0.0464
AG	-0.0009	0.0009	-1.03	0.304	-0.0026 to 0.0008
Industry 2	-0.1262	0.0331	-3.82	0.000	-0.1916 to -0.0609
Industry 3	-0.0564	0.0333	-1.70	0.092	-0.1220 to 0.0092

Industry 4	0.0155	0.0351	0.44	0.659	-0.0537 to 0.0847
Industry 5	0.0432	0.0374	1.15	0.250	-0.0306 to 0.1170
Industry 6	-0.0553	0.0361	-1.53	0.127	-0.1265 to 0.0159
Industry 7	-0.0176	0.0406	-0.43	0.665	-0.0977 to 0.0625
Year 2016	0.0048	0.0094	0.51	0.611	-0.0138 to 0.0234
Year 2017	0.0195	0.0109	1.80	0.074	-0.0019 to 0.0409
Year 2018	0.0433	0.0127	3.41	0.001	0.0183 to 0.0684
Year 2019	0.0546	0.0152	3.60	0.000	0.0247 to 0.0845
Year 2020	0.0993	0.0196	5.07	0.000	0.0606 to 0.1380
Year 2021	0.0670	0.0197	3.40	0.001	0.0282 to 0.1059
Year 2022	0.0621	0.0231	2.69	0.008	0.0166 to 0.1076
Constant	-0.0853	0.1040	-0.82	0.413	-0.2905 to 0.1199

1. If the *Prob* > *F* values for both the ROA and NDROA models are within the 1% to 5% range, this indicates alignment and the absence of earnings management.
2. If the *Prob* > *F* value for one or both of the ROA and NDROA models falls outside the 1% to 5% range, this indicates misalignment and the presence of opportunistic earnings management behavior.

The ROA model (discretionary performance) is defined as:

$$ROA\_it = \beta\_0 + \beta\_1 (LEV)\_it + \beta\_2 (\sigma ROA)\_it + \beta\_3 (LQ)\_it + \beta\_4 (IV)\_it + \beta\_5 (SG)\_it + \beta\_6 (SIZE1)\_it + \beta\_7 (SIZE2)\_it + \beta\_8 (AGE)\_it + \varepsilon\_it$$

According to the sub-hypotheses related to ROA and based on the estimation results of the ROA model after controlling for year and industry effects and correcting heteroscedasticity and serial correlation in the error terms, the hypothesis testing results are presented in the following table:

Table 9. Results of Sub-Hypotheses for the ROA Model (Discretionary Performance)

No.	Variable Symbol	Variable Name	Coefficient	t-value	Significance	Sign	Initial Theory	Accepted at 5%	Theory Adjusted	Final Accepted Theory
1	LEV	Capital Structure (Leverage)	-0.1994	-9.11	0.000	-	Trade-off & Pecking Order	Accepted	No	Trade-off & Pecking Order
2	σROA	Risk of Discretionary Performance	0.5665	3.73	0.000	+	Agency Theory	Accepted	No	Agency Theory
3	LQ	Liquidity	0.0257	3.89	0.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off Theory
4	IV	Inventory Investment	-0.0281	-0.73	0.465	-	Trade-off & Pecking Order	Rejected	Yes	Agency Theory
5	Size1	Firm Size 1 (Log Total Assets)	0.0051	0.41	0.685	+	Trade-off & Pecking Order	Rejected	Yes	Agency Theory
6	Size2	Firm Size 2 (Log Total Sales)	0.0259	3.39	0.001	+	Trade-off & Pecking Order	Accepted	No	Trade-off & Pecking Order
7	AG	Firm Age (Years Active)	-0.0008	-1.28	0.204	-	Agency Theory	Rejected	Yes	Trade-off & Pecking Order

The NDROA model (unmanaged performance) is defined as:

$$NDROA\_it = \beta\_0 + \beta\_1 (LEV)\_it + \beta\_2 (\sigma NDROA)\_it + \beta\_3 (LQ)\_it + \beta\_4 (IV)\_it + \beta\_5 (SG)\_it + \beta\_6 (SIZE1)\_it + \beta\_7 (SIZE2)\_it + \beta\_8 (AGE)\_it + \varepsilon\_it$$

According to the sub-hypotheses related to NDROA and based on the estimation results after controlling for year and industry effects and correcting heteroscedasticity and serial correlation, the results are shown below:

Table 10. Results of Sub-Hypotheses for the NDROA Model (Unmanaged Performance)

No.	Variable Symbol	Variable Name	Coefficient	t-value	Significance	Sign	Initial Theory	Accepted at 5%	Theory Adjusted	Final Accepted Theory
1	LEV	Capital Structure (Leverage)	-0.1702	-6.65	0.000	-	Trade-off & Pecking Order	Accepted	No	Trade-off & Pecking Order
2	σNDROA	Risk of Unmanaged Performance	0.6629	4.79	0.000	+	Agency Theory	Accepted	No	Agency Theory
3	LQ	Liquidity	0.0255	3.30	0.001	+	Trade-off & Pecking Order	Accepted	No	Trade-off Theory
4	IV	Inventory Investment	-0.0306	-0.71	0.478	-	Trade-off & Pecking Order	Rejected	Yes	Agency Theory
5	Size1	Firm Size 1 (Log Total Assets)	0.0115	0.74	0.460	+	Trade-off & Pecking Order	Rejected	Yes	Agency Theory
6	Size2	Firm Size 2 (Log Total Sales)	0.0283	3.08	0.002	+	Trade-off & Pecking Order	Accepted	No	Trade-off & Pecking Order
7	AG	Firm Age (Years Active)	-0.0009	-1.03	0.304	-	Agency Theory	Rejected	Yes	Trade-off & Pecking Order

Table 11. Main Hypotheses Comparison: ROA (Discretionary) vs NDROA (Unmanaged)

No.	Variable Symbol	Variable Name	NDROA Significance	NDROA Sign	NDROA Theory	ROA Significance	ROA Sign	ROA Theory	Alignment	Earnings Management
1	LEV	Capital Structure (Leverage)	0.000	-	Trade-off Theory	0.000	-	Trade-off Theory	Aligned	No
2	σROA / σNDROA	Performance Risk	0.000	+	Agency Theory	0.000	+	Agency Theory	Aligned	No
3	LQ	Liquidity	0.001	+	Trade-off Theory	0.000	+	Trade-off Theory	Aligned	No
4	IV	Inventory Investment	0.478	-	Agency Theory	0.465	-	Agency Theory	Misaligned	Yes
5	Size1	Firm Size 1 (Assets)	0.460	+	Agency Theory	0.685	+	Trade-off Theory	Misaligned	Yes
6	Size2	Firm Size 2 (Sales)	0.002	+	Trade-off Theory	0.001	+	Trade-off Theory	Aligned	No
7	AG	Firm Age	0.304	-	Trade-off Theory	0.204	-	Trade-off Theory	Misaligned	Yes

Given that we have stated that the capital structure of firms listed on the Tehran Stock Exchange affects performance, the hypotheses of each model—ROA and NDROA—were tested separately using regression models with the inclusion of control variables. Ultimately, both hypotheses (ROA and NDROA models) were compared to determine whether the two models are aligned, whether theory adjustment has occurred, and whether management has employed discretionary accruals to engage in earnings management.

Analysis and Interpretation of Hypotheses in the ROA Model (Discretionary Performance)

1. Based on modern capital structure theories, the relationship between financial leverage and discretionary performance is significant. In the estimation of the ROA model (discretionary performance), the t-statistic for the capital structure variable (LEV) is -9.11, with a p-value of 0.000. Since the p-value is below 5%, capital structure has a significant negative effect on ROA (discretionary performance).

In the same model, the t-statistic for the risk of discretionary performance (σROA) is 3.73, with a p-value of

0.000. Since the p-value is below 5%, risk has a significant positive effect on ROA (discretionary performance).

2. Based on modern capital structure theories, the relationship between corporate liquidity and discretionary performance is significant. In the estimation of the ROA model (discretionary performance), the t-statistic for corporate liquidity (LQ) is 3.89, with a p-value of 0.000. Since the p-value is below 5%, liquidity has a significant positive effect on ROA (discretionary performance).
3. According to adjustments in modern capital structure theories, a non-aligned or non-significant difference between inventory investment and discretionary vs. unmanaged performance indicates opportunistic earnings management. In the estimation of the ROA model (discretionary performance), the t-statistic for inventory investment (IV) is -0.73, with a p-value of 0.465. Since the p-value is above 5%, inventory investment does not have a significant negative effect on ROA.

In the same model, the t-statistic for firm size 1 (siz1, log of total assets) is 0.41, with a p-value of 0.685. Since the p-value exceeds 5%, firm size 1 does not have a significant positive effect on ROA.

In contrast, the t-statistic for firm size 2 (siz2, log of total sales) is 3.39, with a p-value of 0.001. Since the p-value is below 5%, firm size 2 has a significant positive effect on ROA.

4. According to trade-off, pecking order, and agency theories, the relationship between firm age (years active) and discretionary performance should be significant. In the ROA model (discretionary performance), the t-statistic for firm age (AG) is -1.95, with a p-value of 0.204. Since the p-value is above 5%, firm age does not have a significant negative effect on ROA.

Analysis and Interpretation of Hypotheses for the NDROA Model (Unmanaged Performance)

1. According to the trade-off, pecking order, and agency theories, the relationship between capital structure and unmanaged performance is significant. In the estimation of the NDROA model (unmanaged performance), the t-statistic for the capital structure variable (LEV) is -6.65, with a p-value of 0.000. Since the p-value is below 5%, capital structure has a significant negative impact on NDROA.
2. According to modern capital structure theories, the relationship between financial leverage and unmanaged performance is significant. In the estimation of the NDROA model, the t-statistic for the risk of unmanaged performance (σNDROA) is 4.79, with a p-value of 0.000. Since the p-value is below 5%, the risk of unmanaged performance has a significant positive effect on NDROA.
3. According to modern capital structure theories, the relationship between corporate liquidity and unmanaged performance is significant. In the NDROA model, the t-statistic for liquidity (LQ) is 3.30, with a p-value of 0.001. As the p-value is below 5%, liquidity significantly and positively affects NDROA.
4. According to modern capital structure theories, the relationship between inventory investment and unmanaged performance is significant. In the NDROA model, the t-statistic for inventory investment (IV) is -0.71, with a p-value of 0.478. Since the p-value exceeds 5%, inventory investment does not have a significant negative effect on NDROA.

The t-statistic for firm size 1 (siz1) is 0.74 with a p-value of 0.460. Since the p-value is above 5%, firm size 1 does not have a significant positive impact on NDROA.

The t-statistic for firm size 2 (siz2) is 3.08, with a p-value of 0.002. Since the p-value is below 5%, firm size 2 has a significant positive effect on NDROA.

5. According to modern capital structure theories, the relationship between firm age and unmanaged performance should be significant. In the NDROA model, the t-statistic for firm age (Ag) is -1.03, with a p-value of 0.304. As the p-value is above 5%, firm age does not significantly affect NDROA.

Comparative Analysis of the Models (ROA vs. NDROA)

1. According to adjustments in modern capital structure theory, a discrepancy in the effect of financial leverage on discretionary versus unmanaged performance may indicate opportunistic earnings management. Both models show a p-value below 5% for the capital structure variable (LEV), with negative coefficients in both ROA and NDROA. This indicates a consistent and significant negative relationship between capital

structure and both types of performance in Iranian firms.

2. Both ROA and NDROA models show p-values below 5% and positive coefficients for performance risk, indicating a significant and positive relationship. This suggests that Iranian firms do not use performance risk as a means of engaging in opportunistic earnings management.
3. The liquidity variable in both models has a p-value below 5% and a positive coefficient, indicating a significant positive effect on performance. This means liquidity is aligned in ROA and NDROA, and firms tend to reduce liquidity in the context of earnings management.
4. The inventory investment variable (IV) in both models has a p-value above 5% and negative coefficients, suggesting that there is no significant relationship between inventory investment and either ROA or NDROA. However, due to misalignment in the direction and significance, this variable indicates the use of opportunistic earnings management.
5. The variable firm size 1 (siz1) has a p-value above 5% in both models and a positive coefficient, implying that managers in Iranian firms may increase reported firm size to engage in earnings management when inventory investment declines.
6. The variable firm size 2 (siz2) shows a p-value below 5% and a positive coefficient in both models. This indicates alignment and confirms that Iranian firms use firm size 2 consistently in earnings reporting, without opportunistic manipulation.
7. The firm age variable (Ag) has a negative coefficient and a p-value above 5% in both models. This indicates misalignment and suggests that older Iranian firms may be more likely to engage in opportunistic earnings management.

Summary Points on Opportunistic Earnings Management in Iranian Firms:

5. Managers in Iranian firms, when reducing inventory investment, tend to report lower liquidity as a form of opportunistic earnings management. The t-statistic signs for the liquidity variable are positive in both models, with p-values of 0.001 (NDROA) and 0.000 (ROA), showing that liquidity is reported as lower when managers use discretionary performance tools.
6. When reducing inventory investment, managers tend to report higher firm size. The t-statistic coefficients for firm size are positive in both models, with p-values of 0.460 (NDROA) and 0.685 (ROA), indicating an increase in reported firm size under discretionary performance.
7. Managers also tend to report increased firm longevity when reducing inventory investment. The t-statistic coefficients for firm age are negative in both models, with p-values moving from -0.304 (NDROA) to -0.204 (ROA), indicating an increase in reported operational history as part of earnings management.

4. Discussion and Conclusion

This study investigated the effect of capital structure on firm performance by distinguishing between managed (ROA) and unmanaged (NDROA) performance in companies listed on the Tehran Stock Exchange and the Iranian over-the-counter market, focusing on the role of inventory investment reduction. The findings indicate that certain financial variables significantly influence both types of performance, while others diverge in their effects, revealing opportunistic earnings management behaviors among managers under specific conditions. By incorporating discretionary and non-discretionary accruals into the model, the analysis provides insights into how capital structure components interact with performance outcomes, ultimately contributing to the refinement of existing capital structure theories.

In both ROA and NDROA models, financial leverage (LEV) showed a significant and negative relationship with firm performance. The coefficient for LEV was negative and statistically significant ($p < 0.01$) in both models, indicating that an increase in debt leads to a decline in performance, whether managed or unmanaged. This aligns with the trade-off theory and pecking order theory, which posit that excessive reliance on debt increases financial risk and interest obligations, thereby negatively impacting firm performance [3, 7, 17]. This finding is also consistent with studies conducted in other emerging markets, such as Ghana and Egypt, which found a detrimental effect of leverage on firm profitability [8, 9]. The consistency across both models suggests that Iranian firms, regardless of whether earnings are managed, are similarly vulnerable to the burdens of high leverage.

The risk of firm performance, as captured by the standard deviation of ROA and NDROA, was positively and significantly related to both types of performance. The coefficients were positive in both models ($p < 0.01$), supporting the view that higher volatility in performance, often tied to risk-taking behavior or market dynamics, corresponds with elevated returns. This reinforces the agency theory perspective that managers are incentivized to undertake risky projects to boost performance metrics [5, 26]. Such results are also consistent with the findings of de Jong et al., who highlight the dual role of risk in enhancing short-term gains while posing long-term threats [6]. The similarity in results across ROA and NDROA implies that the observed risk-return relationship holds regardless of the presence of earnings management, potentially reflecting structural characteristics of firms in the Iranian capital market.

Liquidity (LQ) showed a positive and significant impact on both ROA and NDROA ($p < 0.01$), underscoring the importance of short-term asset availability in supporting firm performance. This aligns with the pecking order theory, which holds that firms prefer internal financing sources such as liquid assets before seeking external debt [1, 2]. Moreover, the result is consistent with findings by [14] that demonstrate the importance of liquidity buffers in shielding firms from adverse shocks. Interestingly, in the context of opportunistic earnings management, the positive impact of liquidity suggests that managers may strategically leverage cash availability to manipulate performance figures when inventory investment decreases—a finding corroborated by [11], who found a link between liquidity and the use of discretionary accruals.

Conversely, inventory investment (IV) did not significantly affect either ROA or NDROA ($p > 0.05$). This insignificance, especially during inventory reduction periods, suggests that managers do not rely directly on changes in inventory investment to drive performance. However, the divergence in the sign of the coefficient and its non-significance is indicative of potential earnings management behavior, where managers may obscure the effect of inventory decisions through discretionary accruals. This observation aligns with the findings of [13], who showed that inefficiencies in capital allocation and investment decisions can drive deviations from optimal capital structure and prompt manipulation of reported outcomes.

Regarding firm size, the study distinguished between two measures: total assets (Size1) and total sales (Size2). Size1 had an insignificant effect on both ROA and NDROA ($p > 0.05$), while Size2 showed a positive and significant relationship with both ($p < 0.01$). The divergence between the two size proxies suggests that sales volume, rather than asset base, is a more reliable indicator of operational performance. These results are partially supported by [15], who found mixed effects of firm size depending on the measure used. Moreover, the significant role of Size2 supports the argument by [18] that firms with higher sales figures are better positioned to absorb debt and generate stable earnings, potentially reducing the need for opportunistic earnings management.

Firm age (AG) was negatively associated with both ROA and NDROA, but the relationship was not statistically significant ($p > 0.05$). This suggests that older firms do not necessarily exhibit superior or inferior performance compared to younger firms. However, when comparing the magnitude of the coefficients between the two models, the difference could imply that older firms may strategically alter their performance presentation in managed performance contexts. These results are consistent with the view that firm maturity is not a definitive driver of profitability and may vary by sector and institutional context [4, 25].

A comparison of the ROA and NDROA models provides evidence for the existence of earnings management, particularly in terms of opportunistic behavior during inventory investment reduction. In the ROA model, certain variables—like liquidity and sales-based size—had slightly higher coefficients compared to the NDROA model, suggesting that managers may exploit these elements when using discretionary accruals. This is supported by [10], who found that socially responsible firms also engage in earnings management through accrual-based mechanisms. Furthermore, the observation that both models yield consistent results in terms of significance but diverge in coefficient magnitude supports the idea that while managed and unmanaged earnings respond similarly to structural variables, the scale of influence differs under managerial discretion.

These findings provide substantial empirical support for refining capital structure theories in emerging markets. While the trade-off and pecking order theories remain generally valid, the evidence points to nuanced applications in practice. For instance, the capital structure-performance link remains strong under both earnings management scenarios, but discretionary elements (such as accruals) mediate how performance is ultimately presented. This

resonates with the argument by [24] that agency costs and capital structure interact dynamically, particularly in the presence of financial distress or competition. In addition, the evidence of consistent performance manipulation during inventory decline periods supports the contention by [20] that managerial discretion intensifies when firms face operational constraints or declining sales.

This study is limited by its geographic scope, focusing solely on Iranian firms listed on the Tehran Stock Exchange and the over-the-counter market. This specificity may limit the generalizability of findings to other emerging markets with different institutional, legal, and economic structures. Additionally, the study relies on accrual-based metrics to identify managed and unmanaged performance, which, while widely used, may not fully capture the breadth of real earnings management. Moreover, potential endogeneity issues inherent in capital structure-performance models could not be fully resolved despite controlling for industry and year effects.

Future research should aim to replicate this model in other emerging markets with distinct economic frameworks to test the robustness of the findings across regions. Incorporating real earnings management proxies—such as production costs, discretionary expenses, or abnormal cash flows—can provide a more comprehensive view of how managers manipulate performance. Additionally, longitudinal studies that track firms across economic cycles could offer insights into how macroeconomic fluctuations influence the relationship between capital structure and performance. Researchers may also explore the moderating effects of governance quality or managerial ownership on the capital structure-performance nexus.

Policymakers and regulators should consider enhancing transparency requirements for inventory disclosures and accrual reporting to curb opportunistic earnings management. Firms should strengthen internal controls and audit mechanisms to ensure that capital structure decisions are aligned with long-term value creation rather than short-term performance manipulation. Managers are encouraged to adopt more conservative financing strategies and avoid excessive leverage, particularly in periods of declining inventory investment, to maintain sustainable performance. Investors should also consider both accrual-based and real performance indicators to assess firm quality and avoid being misled by managed earnings.

Authors' Contributions

Authors equally contributed to this article.

Acknowledgments

Authors thank all participants who participate in this study.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

References

[1] M. Z. Frank and V. K. Goyal, "Testing the pecking order theory of capital structure," *Journal of Financial Economics*, vol. 67, no. 2, pp. 217-248, 2003, doi: https://doi.org/10.1016/S0304-405X(02)00252-0.

[2] M. T. Leary and M. R. Roberts, "Do firms rebalance their capital structures?," *The Journal of Finance*, vol. 60, no. 6, pp. 2575-2619, 2005, doi: https://doi.org/10.1111/j.1540-6261.2005.00811.x.

[3] A. N. Berger and E. B. Di Patti, "Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry," *Journal of Banking & Finance*, vol. 30, no. 4, pp. 1065-1102, 2006, doi: https://doi.org/10.1016/j.jbankfin.2005.05.015.

[4] R. Deesomsak, K. Paudyal, and G. Pescetto, "The determinants of capital structure: Evidence from the Asia Pacific region," *Journal of Multinational Financial Management*, vol. 14, no. 4, pp. 387-405, 2004, doi: https://doi.org/10.1016/j.mulfin.2004.03.001.

[5] A. N. Berger and E. B. d. Patti, "Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry," 2002, doi: https://doi.org/10.17016/feds.2002.54.

[6] I. A. Strebulaev, "Do tests of capital structure theory mean what they say?," *The Journal of Finance*, vol. 62, no. 4, pp. 1747-1787, 2007, doi: https://doi.org/10.1111/j.1540-6261.2007.01256.x.

[7] J. Abor, "The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana," *The Journal of Risk Finance*, vol. 6, no. 5, pp. 438-445, 2005, doi: https://doi.org/10.1108/15265940510633505.

[8] J. Abor, "Debt policy and performance of SMEs: Evidence from Ghanaian and South African firms," *The Journal of Risk Finance Incorporating Balance Sheet*, vol. 8, no. 4, pp. 364-379, 2007, doi: https://doi.org/10.1108/15265940710777315.

[9] I. E. S. Ebaid, "The impact of capital-structure choice on firm performance: Empirical evidence from Egypt," *The Journal of Risk Finance*, vol. 10, no. 5, pp. 477-487, 2009, doi: https://doi.org/10.1108/15265940911001385.

[10] H. Shi, H. Liu, and Y. Wu, "Are socially responsible firms responsible to accounting? A meta-analysis of the relationship between corporate social responsibility and earnings management," *Journal of Financial Reporting and Accounting*, vol. 22, no. 3, pp. 311-332, 2024, doi: 10.1108/JFRA-06-2021-0171.
[11] M. S. Nuhu, Z. Ahmad, and L. Y. Zhee, "Nexus Among Disclosure Quality, Discretionary Accruals and Real Earnings Management Practices: An Empirical Analysis of Malaysian Public Firms," *Journal of Corporate Accounting & Finance*, vol. 35, no. 4, pp. 121-138, 2024, doi: 10.1002/jcaf.22720.
[12] D. Rahman, M. Kabir, and B. Oliver, "Does exposure to product market competition influence insider trading profitability?," *Journal of Corporate Finance*, vol. 66, p. 101792, 2021, doi: https://doi.org/10.1016/j.jcorpfin.2020.101792.
[13] F. Sohailifar, M. R. Ahmadi, A. Jorjorzadeh, and S. Nasiri, "Deviation from the optimal capital structure and inefficiency of business unit investments," *Accounting Knowledge*, vol. 11, no. 2, pp. 107-137, 2020.
[14] L. Gan, W. Lv, and Y. Chen, "Capital structure adjustment speed over the business cycle," *Finance Research Letters*, vol. 39, p. 101574, 2021, doi: https://doi.org/10.1016/j.frl.2021.101574.
[15] B. Jonsson, "Does the size matter? The relationship between size and profitability of Icelandic firms," *Bifröst Journal of Social Science*, vol. 1, 2008.
[16] K. Li, J. Niskanen, and M. Niskanen, "Capital Structure and Firm Performance in European SMEs: Does Credit Risk Make a Difference?," *Managerial Finance*, vol. 45, no. 5, pp. 582-601, 2019, doi: https://doi.org/10.1108/MF-01-2017-0018.
[17] A. Saeedi and I. Mahmoodi, "Capital structure and firm performance: Evidence from Iranian companies," *International Research Journal of Finance and Economics*, vol. 70, pp. 20-29, 2011.
[18] A. Aflatuni, "The impact of deviation from the target capital structure on firm value," *Financial Management Outlook*, vol. 9, no. 2, pp. 9-31, 2019.
[19] U. M. Tanko, "Financial attributes and corporate tax planning of listed manufacturing firms in Nigeria: moderating role of real earnings management," *Journal of Financial Reporting and Accounting*, 2023, doi: https://doi.org/10.1108/JFRA-05-2022-0198.
[20] R. Mubeen, D. Han, J. Abbas, and I. Hussain, "The effects of market competition, capital structure, and CEO duality on firm performance: A mediation analysis by incorporating the GMM model technique," *Sustainability*, vol. 12, no. 3840, pp. 1-18, 2020, doi: https://doi.org/10.3390/su12083480.
[21] A. Aflatuni and M. Amin Amir Bakhtiari, "The role of disclosure quality and the quality of accruals in reducing deviations from the optimal capital structure," *Asset Management and Financial Supply*, vol. 19, no. 3, pp. 167-180, 2017.
[22] S. Z. Nazari Ardabili, P. Benisi, and H. Vatankhah, "Designing the Maturity Management Model of Educational Technology in Iranian Schools," *Sociology of Education*, vol. 10, no. 1, pp. 314-326, 2024, doi: 10.22034/ijes.2024.2022649.1536.
[23] I. L. Indomo and A. W. Lubis, "Capital structure behaviour among Indonesian property developers during different business cycles," *Journal of Financial Management of Property and Construction*, vol. 28, no. 1, pp. 91-106, 2023.
[24] M. Ugur, E. Solomon, and A. Zeynalov, "Leverage, competition and financial distress hazard: Implications for capital structure in the presence of agency costs," *Economic Modelling*, vol. 108, p. 105740, 2022, doi: https://doi.org/10.1016/j.econmod.2021.105740.
[25] Y. Kim, S. Choi, and B.-J. Kim, "How Does a Firm's Earnings Response Coefficient Vary with Managerial Ability? Evidence from Korea," *Emerging Markets Finance and Trade*, vol. 59, no. 4, pp. 1104-1114, 2023/03/16 2023, doi: 10.1080/1540496X.2022.2128750.
[26] A. Shamsad, "The impact of financial leverage and product competition on financial distress risk: Consequences of capital structure in the presence of agency costs," *Journal of Financial Studies*, vol. 1, no. 1, pp. 56-68, 2023.