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Adjustment of Capital Structure Theories Using Managerial, Governmental, and Institutional Ownership in Presenting a New Model of Managed and Unmanaged Performance

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Abstract

This study examines the role of earnings management in the relationship between managed and unmanaged performance, ownership structure, and capital structure. Earnings management is divided into discretionary and non-discretionary accruals in order to test classical theories of capital structure. If earnings management is absent, all influencing factors on the dependent variable become significant at the 5% level, and thus, no adjustment in the theories of capital structure and ownership structure occurs. Otherwise, theory adjustment takes place. Therefore, the main objective of this research is to adjust capital structure theories by incorporating managerial ownership, governmental ownership, and institutional ownership with regard to managed and unmanaged performance. The final statistical sample of this study consists of 173 companies listed on the Tehran Stock Exchange and the Iran Fara Bourse (IFB). The general findings are categorized into two groups: companies with low dependence on managerial ownership—i.e., companies with weak managerial ownership—and those with high dependence on managerial ownership—i.e., companies with strong managerial ownership. The results are as follows: a) Companies with weak managerial ownership: In such companies, managers, through their discretionary performance, present higher levels of managerial ownership, firm age, and paid taxes, while reporting lower levels of firm size, leverage, and risk. b) Companies with strong managerial ownership: In these companies, managers use their discretionary performance to engage in opportunistic earnings management by inflating size, taxes, age, and governmental ownership, while concealing the tangibility of assets and ownership concentration. Accordingly, this study reveals that in Iranian firms with weak managerial and governmental ownership, managers use discretionary performance to manipulate capital structure for opportunistic earnings management.

Keywords: Adjustment of modern capital structure theory, managerial ownership, governmental ownership, institutional ownership, earnings management

1. Introduction

The relationship between ownership structure and firm performance has long been a central topic in financial and organizational research. In particular, the distinction between managed performance (ROA) and unmanaged performance (NDROA) has gained increasing attention in recent years, especially in the context of emerging economies where corporate governance mechanisms, ownership configurations, and capital structure decisions diverge substantially from those in

developed markets. In Iran, this relationship is further complicated by the dominance of semi-state institutions, complex agency relationships, and varied strategic behavior by managers in response to institutional constraints (Namazi & Ebrahimi, 2013; Yeganeh et al., 2008).

Prior research has indicated that ownership structure plays a crucial role in shaping corporate decisions. According to Rafizadeh et al. (2023), there are threshold effects in how managerial ownership affects capital structure and dividend policies in listed companies, implying that the level of ownership can shift managerial incentives significantly (Rafizadeh et al., 2023). In a similar vein, the findings of Wang (2023) suggest that product market maturity moderates the effect of ownership structure on capital structure, emphasizing that context matters in the governance-performance relationship (Wang, 2023). The Iranian market, characterized by relatively underdeveloped governance practices and opaque ownership structures, provides a fertile ground for examining such dynamics.

The distinction between managed (ROA) and unmanaged (NDROA) performance metrics is essential for understanding the extent to which managerial discretion distorts reported performance figures. Managed performance reflects both genuine economic outcomes and earnings management efforts, while unmanaged performance is adjusted for discretionary components and thus offers a more objective measure of operational efficiency. This distinction is particularly salient in firms with varying degrees of managerial ownership. Hamidian et al. (2020) demonstrated that managerial ownership significantly correlates with firm performance and capital structure decisions, but the direction and intensity of this relationship depend on the degree of ownership concentration (Hamidian et al., 2020).

Board characteristics also play a mediating role in the ownership-performance relationship. Sajadi et al. (2022) found that specific board attributes, such as independence and size, can influence how ownership structure translates into earnings classifications and managerial decisions (Sajadi et al., 2022). This implies that the composition of corporate boards may either constrain or amplify the effect of ownership on performance management. Namazi and Monfared (2011) earlier asserted that operational restrictions—such as limitations in board structure—can significantly influence how governance translates into financial outcomes (Namazi & Mohammad Monfared, 2011). These studies collectively suggest that both structural and behavioral governance factors need to be integrated into models analyzing performance outcomes.

Capital structure, another key determinant of firm performance, has received substantial empirical attention. Haji Khan Mirzaei and Tohidloo (2021) identified the core determinants of capital structure decisions in listed Iranian companies, noting that leverage choices often reflect not only financial optimization but also agency-related considerations (Haji Khan Mirzaei & Tohidloo, 2021). Similarly, Montaseri et al. (2021) linked income diversification and capital structure to profitability, underscoring the interconnectedness of strategic financial decisions in firm performance outcomes (Montaseri et al., 2021). These insights are relevant to the current study, which seeks to understand whether and how firms with differing levels of managerial ownership adjust their capital structure to manage performance.

One of the significant concerns in corporate finance literature is earnings management, especially in contexts where ownership is diffused and agency costs are high. According to Moradzadeh et al. (2009), institutional ownership can reduce earnings management practices by enhancing monitoring and reducing informational asymmetry (Moradzadeh et al., 2009). However, Mehrani et al. (2010) observed that the presence of institutional investors does not uniformly improve financial reporting quality, as these investors may also pursue their own interests in certain ownership configurations (Mehrani et al., 2010). This highlights the importance of distinguishing between types of institutional ownership—passive versus active—when analyzing their influence on performance metrics.

In Iranian listed companies, governmental and quasi-governmental ownership further complicate the governance landscape. Roshan and Khodarahmi (2024) measured credit risk and capital adequacy of Iranian banks by accounting for ownership structure and firm size, concluding that state involvement significantly influences risk-adjusted performance measures (Roshan & Khodarahmi, 2024). This insight aligns with the findings of Namazi and Ebrahimi (2013), who emphasized that state ownership, board composition, and firm size jointly influence technical efficiency in Iranian firms (Namazi & Ebrahimi, 2013). Hence, understanding the interplay between ownership type and performance management practices is vital for any analysis of emerging markets.

From a broader perspective, governance mechanisms such as board duality and institutional ownership impact not only performance but also strategic choices. Dadbeh and Mirzaei (2021) found that CEO duality moderates the relationship between geographic diversification and firm performance, suggesting that leadership structure can influence strategic diversification and resource allocation (Dadbeh & Mirzaei Goudarzi, 2021). This resonates with international findings. For instance, Rajput et al. (2023) emphasized the role of human resource management and governance systems in leveraging human capital for performance gains (Rajput et al., 2023). Thus, integrating structural governance elements with strategic behavior remains essential.

The Iranian capital market offers a unique institutional context for studying the effect of ownership structure on performance management due to its transitional characteristics. Najafi and Tootian Isfahani (2020) analyzed how proactive versus defensive strategies influence financial distress, showing that strategic orientation is not uniform across ownership types and significantly impacts performance outcomes (Najafi & Tootian Isfahani, 2020). Mohaghegh Kia (2021) further contributed by examining how market power and competition mediate the link between governance and earnings management, finding that stronger governance mechanisms may not always constrain opportunistic behaviors in monopolistic settings (Mohaghegh Kia, 2021). These findings suggest that market structure and ownership interdependencies must be accounted for in evaluating corporate behavior.

In methodological terms, the use of discretionary and non-discretionary performance metrics allows researchers to isolate the impact of managerial behavior from structural constraints. The literature has increasingly moved toward adopting dual-performance models, such as the separation of ROA and NDROA, to distinguish between genuine economic productivity and earnings management artifacts (Rafizadeh et al., 2023; Roshan & Khodarahmi, 2024). This dual-approach framework is particularly valuable in economies like Iran, where performance indicators may be subject to manipulation due to weak regulatory enforcement or opportunistic behavior by dominant stakeholders. The purpose of this study is to explore how managerial ownership and firm characteristics influence managed and unmanaged performance and whether these relationships differ depending on the level of managerial discretion.

2. Methods and Materials

This study is an *applied research* in terms of its objective. Applied research is conducted to examine practical constructs within scientific contexts. It often leads to the development of methodologies or models. This type of research serves as a foundation for basic research but requires comparatively less time.

The data for this study were collected using an *ex post facto* approach (i.e., historical data). The variables have occurred in the past and cannot be manipulated or controlled by the researcher. This study objectively and systematically describes events without subjective inference, thus classifying it as *descriptive research*.

Descriptive research aims to assess the conditions, methods, and situations of a phenomenon, evaluate opinions and data, and identify and examine relationships among variables (through induction). Additionally, this research investigates the changes in one or more variables as a result of changes in other variables, making it *correlational* in nature.

In correlational studies, as in experimental designs, there is no manipulation of variables. Although these studies do not necessarily aim to identify causal relationships, the findings can be used for *predictive purposes*.

Therefore, from the perspective of research implementation, this study is categorized as a *descriptive-correlational* study, with the primary aim of identifying the existence, strength, and nature of relationships among the examined variables.

From the perspective of research purpose, this study utilizes existing models, methods, and theories to enhance decision-making within the research domain. The primary objective is to *adjust capital structure theories* by incorporating *managerial ownership, governmental ownership, and institutional ownership* in proposing a novel model of *managed and unmanaged performance* in the Tehran Stock Exchange and Iran Fara Bourse.

Thus, it is considered *applied research*. The Modigliani and Miller (1958) theory claims that capital structure is irrelevant to firm value. However, Jensen and Meckling (1976) argue that capital structure is related to firm value based on *agency theory*, *trade-off theory*, and *pecking order theory*, suggesting that capital structure can be optimized based on firm performance.

In other words, *performance metrics* are used to optimize capital structure. The proposed model is grounded in alternative capital structure theories, which assume that firm performance can be maximized by either reducing *agency costs* or improving the trade-off between *benefits and costs of debt*.

This model identifies the impact of capital structure—measured through *leverage*—on firm performance along with associated control variables.

Since the effects of model variables are examined using historical data from firms listed on the Tehran Stock Exchange between 2013 and 2021, the study is classified as *ex post facto* in terms of its design.

From a methodological standpoint, this study employs an efficient model such as the *panel data model*, including *robustness tests* to address *cross-sectional heterogeneity*. Therefore, the findings of this model have significant implications for the impact of capital structure on firm performance, in both earnings-managed and non-managed contexts.

Next, the performance variable is divided into two categories: *performance based on discretionary measures* and *performance based on non-discretionary measures*. The goal is to identify and compare the directional outcomes of these two approaches.

If the direction of the relationship is the same for both categories, it can be concluded that earnings management is intended to improve capital structure performance, leading to *efficient earnings management*. Conversely, *mismanagement* leads to *opportunistic earnings management*.

Moreover, this categorization indicates whether the performance of capital structure—either discretionary or non-discretionary—is consistent with a single underlying capital structure theory.

If theoretical inconsistencies are observed, then earnings management has an *adverse effect* on capital structure by distorting its actual performance.

Modern and Classical Models of Capital Structure Performance

In this model, firm performance is measured using *Return on Assets (ROA)* and *Non-Discretionary Return on Assets (NDROA)* as dependent variables to evaluate financial performance. A set of control variables, with expected directional signs, are employed to measure their relationship with firm performance.

The general model is presented as follows:

Man-OWN ROA_it = β_0 + β_1 ROA_it + β_2 Size_i + β_3 Profit_i + β_4 Debt_i + β_5 σROA_it + β_6 TAX_it + β_7 AG_it + ε_1i

ROA_it = β_0 + β_1 Man-OWN ROA_it + β_2 Size_it + β_3 Debt_it + β_4 σROA_it + β_5 TAX_it + β_6 AG_it + β_7 Conci_it + β_8 Inst_it + β_9 Stat_it + β_10 TAN_it + ε_2i,t

Man-OWN NDROA_it = β_0 + β_1 NDROA OWN_it + β_2 Size_i + β_3 Profit_i + β_4 Debt_i + β_5 σNDROA_it + β_6 TAX_it + β_7 AG_it + ε_1i

NDROA_it = β_0 + β_1 Man-OWN NDROA_it + β_2 Size_it + β_3 Debt_it + β_4 σNDROA_it + β_5 TAX_it + β_6 AG_it + β_7 Conci_it + β_8 Inst_it + β_9 Stat_it + β_10 TAN_it + ε_2i,t

Where:

- *ROA* is the financial performance of firm *i* at time *t*.
- β_0 is the regression intercept.
- *Debt* represents the leverage of firm *i* at time *t*.
- *LQ* is the liquidity of firm *i* at time *t*.
- *IV* is inventory investment of firm *i* at time *t*.
- *SG* is 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*.
- *AG* is the number of years since the establishment of firm *i* until the data collection year.
- ε is the error term.

From a methodological perspective, this study employs an efficient model—panel data analysis—along with *robustness testing* to handle cross-sectional heteroskedasticity.

The findings of this model yield significant implications regarding the impact of capital structure on firm performance under conditions of both managed and unmanaged earnings.

Earnings Management

Some researchers adopt an informative perspective on earnings management, defining it as the manipulation of profit figures by managers, through which private and confidential information about the firm's future performance is conveyed to investors. Earnings management occurs when managers use their personal judgment in financial reporting to alter the direction of reported financial outcomes.

Performance

Performance is calculated in two ways. The first is *Return on Assets (ROA)*, which represents managed performance based on net income (NI) including both discretionary and non-discretionary accruals. The second is *Non-Discretionary Return on Assets (NDROA)*, which is based on non-discretionary net income (NDNI) and reflects unmanaged performance (Subramanyam, 1996).

Net income (NI) includes cash flows from operations and all types of accruals, including non-discretionary accruals (accruals not controlled by managers or necessary for smooth business operations) and discretionary accruals (manager-driven accruals not deemed obligatory).

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

NI = CFO + NDA + DA

NDNI = CFO + NDA

Various methods exist for separating discretionary and non-discretionary accruals based on accounting standards and capital structure changes. To estimate discretionary accruals, we use the *Modified Jones Model* adjusted for performance, which—unlike other accrual models—accounts for firm performance (Kothari et al., 2005):

$$TAC_{it} = \beta_0 + \beta_1 (1/A_{it}) + \beta_2 (\Delta Revenue - \Delta AccReceivable)/A_{it} + \beta_3 (PPE_{it}/A_{it}) + \beta_4 ROA_{it} + v_{it}$$

Where *TAC* is total accruals, *AR* is accounts receivable, *PPE* is property, plant, and equipment, and *A_it* is total assets. All variables are scaled by total assets to reduce heteroskedasticity. The explained portion is considered non-discretionary accruals, and the residual is attributed to discretionary accruals—interpreted as earnings management.

Based on the above, two dependent variables are used:

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

Each dependent variable is initially entered into the model separately, and results are compared to determine whether capital structure performance is consistent under both ROA types.

Measurement of Capital Structure

Harris and Raviv (1991) argue that leverage, as an operational indicator, is a critical explanatory variable due to its influence on result interpretation. Rajan and Zingales (1995) also show that determinants of capital structure are highly sensitive to how leverage is measured.

Previous literature has used different indicators to represent financial leverage (Abor, 2005; Obeid, 2009; Saeedi & Mahmoodi, 2011), including:

- Short-term debt to total assets (STD)
- Long-term debt to total assets (LTD)
- Total debt to total assets (TD)

Given the specific model framework, the study classifies variables into two groups:

1. **Endogenous variables**
2. **Exogenous variables**

According to Gujarati (2004), an *exogenous variable* is not influenced by any variable within the model, while its value is determined externally. An *endogenous variable* is influenced by at least one other variable in the model. Not only does it

depend on exogenous variables, but some endogenous variables also mutually affect each other, making traditional classifications of dependent and independent variables less meaningful.

Endogenous Variables (Internal Relationships)

- **Managerial Ownership**: Following Curran et al. (2007) and Hasan & Butt (2009), managerial ownership is measured as the percentage of common shares owned by executive and non-executive directors.
- **Performance (Total and Managed Performance)**: ROA is used to account for firm size effects across diverse industries and firm scales, helping mitigate size-related bias.

Exogenous Variables

- **Firm Size**: According to Boone et al. (2007) and Namazi & Monfared (2011), firm size is measured as the natural logarithm of the firm's market value at the end of the fiscal year. It affects both managerial ownership and performance.
- **Firm Size = log(Market Value of Equity)**
- **Profitability**: Consistent with Cespedes et al. (2010), Margaritis & Psillaki (2010), and Fatma & Chichti (2011), profitability is defined as:
- **EBIT / Total Assets**
- **Debt**: In this model, long-term debt is used to measure debt utilization in capital structure, as long-term debt facilitates long-term investment and profitability. Based on Poureiu-Mauri (2009), it is measured as:
- **Long-term Debt / Total Assets**
- **Risk**: Empirical studies by Loderer & Martin (1997), Demsetz & Lehn (1985), and Drakos & Bekiris (2010) demonstrate a positive relationship between risk and managerial ownership. Risk is measured by the percentage volatility in stock prices.
- **Taxation**: Based on Fatma & Chichti (2011), the tax variable is calculated as:
- **Tax Paid / EBIT**
- **Institutional Ownership**: Berle and Means (1932) argue that the absence of effective corporate governance mechanisms enables managers to pursue personal interests over shareholder value. According to Gillan & Starks (1998), institutional investors play a pivotal role in driving governance reforms. Velury & Jenkins (2006) also argue this role stems from monitoring activities aligned with agency theory. Institutional ownership is therefore expected to significantly impact firm performance.

Institutional Ownership Level and Concentration

Following Kumar (2003), Ehrhardt & Lizal (2006), and Namazi & Ebrahimi (2013), institutional ownership concentration is defined as the proportion of shares held by the largest institutional owner relative to total outstanding shares.

- **Institutional Ownership Level** = Total institutional shares / Total shares
- **Institutional Ownership Concentration** = Shares held by the largest institutional owner / Total shares

Ownership Concentration

Ownership concentration is another independent variable. Demsetz & Lehn (1985) define it as the percentage of shares held by the top 5 or 20 shareholders, often measured using the *Herfindahl-Hirschman Index* (HHI), calculated as the sum of squared ownership percentages:

$$\mathbf{HHI = \sum (SHARE\_i,j)^2}$$

Where $SHARE\_i,j$ is the ownership percentage of shareholder i in firm j. This study uses HHI to capture ownership concentration, with higher values indicating greater concentration and fewer dominant shareholders. Because some firms do not disclose ownership below 7% in financial reports, only ownership stakes equal to or above 7% are included in HHI calculations.

State Ownership

Due to monopoly characteristics, lack of profit orientation, absence of shareholder oversight, and political considerations, state ownership often leads to inefficiency. In contrast, private ownership reduces inefficiency through competition and accountability. Thus, state ownership can significantly affect firm performance. In this study, state ownership is defined as:

State Ownership = Government-held shares / Total equity

Table 1. Research Variables in the Model

Row	Variable Symbol	Variable Name	Variable Type	Calculation Description	Reference
1	ROA OWN	Firm performance for company *i* at time *t*	Endogenous	Net income divided by total assets; prior studies used different performance metrics	Demsetz & Lehn (1985)
2	NDROA OWN	Non-discretionary return on assets for company *i* at time *t*	Endogenous	NDNI (includes cash flow from operations and non-discretionary accruals) divided by total assets	Subramanyam (1996)
3	MAN OWNS	Managerial ownership for company *i* at time *t*	Endogenous	Percentage of common shares held by executive and non-executive directors	Subramanyam (1996)
4	SIZE	Firm size for company *i* at time *t*	Exogenous	Natural logarithm of the market value of equity at year-end	Boone et al. (2007); Namazi & Monfared (2011)
5	PROFIT	Profitability for company *i* at time *t*	Exogenous	Earnings before interest and taxes (EBIT) divided by total assets	Cespedes et al. (2010); Margaritis & Psillaki (2010); Fatma & Chichti (2011)
6	DEBT	Leverage for company *i* at time *t*	Exogenous	Long-term debt divided by total assets	Poureiu-Mauri (2009); Melo & Miranda (2010)
7	RISK	Risk for company *i* at time *t*	Exogenous	Percentage change in stock price (volatility)	Loderer & Martin (1997); Demsetz & Lehn (1985)
8	TAX	Tax	Exogenous	Tax paid divided by EBIT	Fatma & Chichti (2011)
9	AG	Firm age	Exogenous	Number of years since the firm's establishment	
10	Inst	Institutional ownership level	Exogenous	Total shares held by institutional owners divided by total outstanding shares, expressed as a percentage	Kumar (2003); Ehrhardt & Lizal (2006); Namazi & Kermani (2008)
11	Conc	Institutional ownership concentration	Exogenous	Herfindahl-Hirschman Index: HHI = $\sum$ (SHARE_(i,j))² where SHARE_(i,j) is the percentage of shares owned by shareholder *i* in firm *j*	Namazi & Ebrahimi (2013)
12	Stat	State ownership	Exogenous	Government-held shares divided by total equity	Fatma & Chichti (2011)
13	TAN	Asset tangibility for company *i* at time *t*	Control	Based on the tangibility of assets	Booth, Aivazian, Demirguc-Kunt & Maksimovic (2001); Campello (2006)

Given that this study separates firm performance into managed and unmanaged performance, it then assesses the efficiency of capital structure under both performance types to identify theoretical shifts (e.g., from the trade-off theory to the pecking order theory) and explain the direction of the relationship between capital structure and performance before and after managerial intervention. This intervention illustrates the impact of earnings management on capital structure performance.

Following model estimation, the relationship between each variable and performance under sub-hypotheses A and B will be presented in separate tables. For example, sub-hypothesis A will be presented in a table similar to the one above, and the same will be done for sub-hypothesis B. The results of both groups will then be placed side-by-side to examine the main hypothesis: the effect of earnings management on performance.

In summary, to identify directional consistency or inconsistency, we consider the following:

1. If both *prob ROA* and *prob NDROA* are within the 1% to 5% significance level, then the relationship is directionally consistent, indicating the absence of earnings management.
2. If either *prob ROA* or *prob NDROA* (or both) fall outside the 1% to 5% significance level, the relationship is directionally inconsistent, indicating the presence of earnings management.

The statistical population of this study includes all companies listed on the Tehran Stock Exchange. The sample consists of a limited number of units from this population that represent its main characteristics. To ensure that the selected sample accurately represents the population, the systematic elimination sampling method was used. For this purpose, the following six criteria were applied. Companies that met all six were included in the final sample, and the rest were excluded:

1. Companies must have been listed on the Tehran Stock Exchange before 2013 and remained active until the end of 2022.
2. To increase comparability, the fiscal year must end in March, and the company must not have changed its fiscal year or business activity during 2013–2022.
3. Investment and financial intermediary firms (e.g., leasing companies, insurance firms, holding companies, banks, and financial institutions) were excluded due to their distinct reporting structures.
4. Companies must not have had trading suspensions longer than 6 months.

5. Financial data must be available for the period from 2013 to 2022.
6. There must be data available for at least 15 companies per industry.

After applying all criteria, 173 companies remained in the filtered population, and all were selected as the study sample. Therefore, the initial number of observations for the 10-year period (2013–2022) is 1,730 firm-year observations (173 firms × 10 years). However, due to the model's specific requirements, the final sample covers 2015 to 2022, resulting in 1,384 firm-year observations (173 firms × 8 years).

In this study, data and information were collected using documentary and library methods. The theoretical background and literature were obtained from books, domestic and international journals, and internet sources. Financial data were retrieved from the financial statements of companies listed on the Tehran Stock Exchange and from information databases such as the official website of the Tehran Stock Exchange, Rahavard Novin software, Iran Tadbir website, RDIS, and other reputable sources.

3. Findings and Results

The results of examining the regression assumptions in the presence of endogenous, exogenous, and instrumental variables, as well as the estimation of the model using instrumental variables, are as follows:

1. **Lagrange Multiplier (LM) Test**: The significance of the LM statistic in the ROA and NDROA models at the 1% level leads to the rejection of the null hypothesis, indicating that the fixed effects model is preferable to the pooled effects model.
2. **Hausman Test**: The significance of the Hausman statistic in the ROA and NDROA models at the 1% level confirms rejection of the null hypothesis, suggesting that the fixed effects model is superior to the random effects model.
3. **Overall Model Significance Test**: The significance of the Sanderson-Windmeijer F-test in both ROA and NDROA models rejects the null hypothesis that the instruments are weak. This confirms a strong relationship between the instrumental variables and the model's endogenous variables.
4. **Instrument Relevance Test**: The significance of the Anderson's Lagrange multiplier statistic in both ROA and NDROA models indicates that the model is not under-identified and that there is a significant correlation between the instruments and the endogenous variables.
5. **Instrument Validity Test**: The non-significance of the Sargan statistic in both ROA and NDROA models suggests no significant correlation between the instruments and the model's error terms, thereby confirming instrument validity.
6. **Endogeneity Test**: The significance of the chi-square statistic for the ROA and NDROA models in the endogeneity test (Endog test) reveals a significant correlation between the endogenous variables and the regression residuals, affirming the endogeneity of the specified variables.

Table 2. Descriptive Statistics for ROA (Discretionary Performance) and NDROA (Unmanaged Performance) in Stata

Variable	M	SD	Min	Max
MANOWNSROA	0.107	0.144	–0.296	0.620
MANOWNSNDROA	0.107	0.157	–0.286	0.666
ROA	0.148	0.189	–0.298	0.637
NDROA	0.148	0.206	–0.288	0.684
SIZE	6.648	0.743	5.188	8.438
DEBT	0.588	0.408	0.052	2.616
SDROA	0.060	0.054	0.002	0.248
SDNDROA	0.078	0.057	0.010	0.275
TAX	0.092	0.090	0.000	0.343
AG (Firm Age)	19.990	9.196	5	46
Conci (Concentration)	0.305	0.209	0.000	0.820
inst (Institutional Ownership)	0.622	0.268	0.000	0.981
stat (State Ownership)	0.505	0.326	0.000	0.988
TAN (Tangibility)	1.270	0.220	1.006	1.871

The average discretionary performance (ROA) is 0.1483 with a standard deviation of 0.1893, while unmanaged performance (NDROA) averages 0.1479 with a higher standard deviation of 0.2063. Managerial ownership associated with discretionary

and non-discretionary performance is quite similar in mean, suggesting relatively stable managerial influence across both dimensions. The average firm size is 6.6481 (log of market value), and the average long-term debt ratio is 0.5878. Volatility (SDROA and SDNDROA) and taxation metrics also show moderate variability. Institutional ownership, ownership concentration, and asset tangibility are moderately distributed across the sample.

Table 3. Estimation Results of the ROA Model with Year and Industry Effects in Stata (Addressing Heteroskedasticity and Serial Correlation of Errors)

Predictor	b	SE	z	p	95% CI
ROA equation					
MANOWNSROA	0.0256	0.0144	1.77	.076	[–0.0027, 0.0539]
SIZE	0.0028	0.0005	5.40	<.001	[0.0018, 0.0038]
PROFIT	0.9106	0.0104	87.25	<.001	[0.8902, 0.9311]
DEBT	–0.0105	0.0012	–9.03	<.001	[–0.0128, –0.0082]
SDROA	–0.0036	0.0076	–0.47	.640	[–0.0186, 0.0114]
TAX	–0.1084	0.0044	–24.83	<.001	[–0.1169, –0.0998]
AG	–0.00003	0.00004	–0.84	.400	[–0.0001, 0.00004]
Constant	–0.0074	0.0036	–2.03	.042	[–0.0145, –0.0003]
MANOWNSROA equation					
ROA	0.7395	0.0089	83.04	<.001	[0.7221, 0.7570]
SIZE	–0.0043	0.0017	–2.46	.014	[–0.0077, –0.0009]
DEBT	0.0246	0.0038	6.44	<.001	[0.0171, 0.0320]
SDROA	–0.1129	0.0239	–4.73	<.001	[–0.1596, –0.0661]
TAX	–0.0296	0.0138	–2.14	.032	[–0.0566, –0.0025]
AG	–0.0002	0.0001	–1.61	.107	[–0.0005, 0.00005]
Conci	–0.0197	0.0086	–2.30	.021	[–0.0365, –0.0029]
inst	0.1137	0.0078	14.62	<.001	[0.0984, 0.1289]
stat	–0.0094	0.0050	–1.90	.058	[–0.0192, 0.0003]
TAN	–0.0018	0.0057	–0.31	.757	[–0.0130, 0.0094]
Constant	–0.0330	0.0146	–2.26	.024	[–0.0617, –0.0044]

ROA Equation Coefficients:

- MANOWNSROA: β = 0.0256, SE = 0.0144, z = 1.77, p = 0.076
- SIZE: β = 0.0028, SE = 0.0005, z = 5.40, p < 0.001
- PROFIT: β = 0.9106, SE = 0.0104, z = 87.25, p < 0.001
- DEBT: β = -0.0105, SE = 0.0012, z = -9.03, p < 0.001
- SDROA: β = -0.0036, SE = 0.0076, z = -0.47, p = 0.640
- TAX: β = -0.1084, SE = 0.0044, z = -24.83, p < 0.001
- AG: β = -0.00003, SE = 0.00004, z = -0.84, p = 0.400

MANOWNSROA Equation Coefficients:

- ROA: β = 0.7395, SE = 0.0089, z = 83.04, p < 0.001
- SIZE: β = -0.0043, SE = 0.0017, z = -2.46, p = 0.014
- DEBT: β = 0.0246, SE = 0.0038, z = 6.44, p < 0.001
- SDROA: β = -0.1129, SE = 0.0239, z = -4.73, p < 0.001
- TAX: β = -0.0296, SE = 0.0138, z = -2.14, p = 0.032
- AG: β = -0.0002, SE = 0.0001, z = -1.61, p = 0.107
- Conci: β = -0.0197, SE = 0.0086, z = -2.30, p = 0.021
- inst: β = 0.1137, SE = 0.0078, z = 14.62, p < 0.001
- stat: β = -0.0094, SE = 0.0050, z = -1.90, p = 0.058
- TAN: β = -0.0018, SE = 0.0057, z = -0.31, p = 0.757

The system of simultaneous equations using 3SLS regression confirms the significant impact of profitability, leverage, and institutional ownership on both firm performance (ROA) and managerial ownership (MANOWNSROA). The negative coefficients for debt and tax variables imply their inverse relationship with firm performance, whereas institutional ownership

exerts a strong positive influence. The interactions of endogenous and exogenous variables within the system provide a robust framework to evaluate earnings management behavior and capital structure performance.

The estimation results of the NDROA model, controlling for year and industry effects and addressing heteroskedasticity and serial autocorrelation of the error terms in Stata, are presented below.

Table 4

Three-Stage Least Squares Regression Results for NDROA and MANOWNSNDROA Equations (N = 1,382)

Predictor	b	SE	z	p	95% CI
NDROA equation					
MANOWNSNDROA	0.1803	0.0746	2.42	.016	[0.0340, 0.3266]
SIZE	0.0062	0.0029	2.14	.032	[0.0005, 0.0118]
PROFIT	0.8225	0.0550	14.96	<.001	[0.7148, 0.9303]
DEBT	0.0154	0.0068	2.26	.024	[0.0020, 0.0288]
SDNDROA	0.1170	0.0370	3.16	.002	[0.0444, 0.1896]
TAX	–0.0706	0.0230	–3.07	.002	[–0.1156, –0.0256]
AG	–0.0001	0.0002	–0.51	.607	[–0.0005, 0.0003]
Constant	–0.0586	0.0205	–2.86	.004	[–0.0988, –0.0185]
MANOWNSNDROA equation					
NDROA	0.7369	0.0089	82.75	<.001	[0.7194, 0.7543]
SIZE	–0.0044	0.0018	–2.38	.017	[–0.0079, –0.0008]
DEBT	0.0204	0.0038	5.42	<.001	[0.0130, 0.0278]
SDNDROA	–0.0985	0.0235	–4.18	<.001	[–0.1446, –0.0524]
TAX	–0.0160	0.0144	–1.11	.269	[–0.0442, 0.0123]
AG	–0.0002	0.0001	–1.67	.094	[–0.0005, 0.0000]
Conci	–0.0265	0.0091	–2.92	.004	[–0.0443, –0.0087]
inst	0.1085	0.0082	13.17	<.001	[0.0923, 0.1246]
stat	–0.0058	0.0053	–1.09	.274	[–0.0161, 0.0046]
TAN	0.0006	0.0060	0.09	.926	[–0.0112, 0.0124]
Constant	–0.0280	0.0154	–1.82	.069	[–0.0583, 0.0022]

Note. N = 1,382. Estimation method: Three-Stage Least Squares (3SLS). Endogenous variables: NDROA, MANOWNSNDROA. Exogenous variables include SIZE, PROFIT, DEBT, SDNDROA, TAX, AG, Conci, inst, stat, and TAN.

The model estimation shows that managerial ownership (MANOWNSNDROA) has a positive and significant effect on non-discretionary return on assets (NDROA) (b = 0.1803, p = .016), indicating that increased managerial ownership is associated with higher unmanaged performance. Profitability (b = 0.8225, p < .001) and firm size (b = 0.0062, p = .032) are also positively associated with NDROA. Conversely, tax burden negatively affects NDROA (b = –0.0706, p = .002).

In the second equation, NDROA significantly influences managerial ownership (b = 0.7369, p < .001), demonstrating bidirectional reinforcement between performance and ownership. Institutional ownership positively affects managerial ownership, while ownership concentration (Conci) has a significant negative effect.

These results collectively support the presence of interdependencies between ownership structure and firm performance under unmanaged performance, reinforcing the need to account for earnings management dynamics in capital structure modeling.

Given that the modern model of ownership structure performance (managerial ownership) is defined as follows:

(1)

Man-OWN ROA_it = $\beta_0 + \beta_1 ROA\_it + \beta_2 Size\_i + \beta_3 Profit\_i + \beta_4 Debt\_i + \beta_5 \sigma ROA\_it + \beta_6 TAX\_it + \beta_7 AG\_it + \varepsilon_1 i$

ROA_it = $\beta_0 + \beta_1 Man\text{-}OWN\ ROA\_it + \beta_2 Size\_it + \beta_3 Debt\_it + \beta_4 \sigma ROA\_it + \beta_5 TAX\_it + \beta_6 AG\_it + \beta_7 Conci\_it + \beta_8 Inst\_it + \beta_9 Stat\_it + \beta_{10} TAN\_it + \varepsilon_2 i,t$

(2)

Man-OWN NDROA_it = $\beta_0 + \beta_1 NDROA\ OWN\_it + \beta_2 Size\_i + \beta_3 Profit\_i + \beta_4 Debt\_i + \beta_5 \sigma NDROA\_it + \beta_6 TAX\_it + \beta_7 AG\_it + \varepsilon_1 i$

NDROA_it = $\beta_0 + \beta_1 Man\text{-}OWN\ NDROA\_it + \beta_2 Size\_it + \beta_3 Debt\_it + \beta_4 \sigma NDROA\_it + \beta_5 TAX\_it + \beta_6 AG\_it + \beta_7 Conci\_it + \beta_8 Inst\_it + \beta_9 Stat\_it + \beta_{10} TAN\_it + \varepsilon_2 i,t$

The managerial ownership equation (Man-OWN) includes: ROA (managed performance), firm size (Size_i), profitability (Profit_i), leverage (Debt_i), risk (σROA), tax (TAX), and firm age (AG).

The ROA equation includes: managerial ownership (Man-OWN), firm size (Size), leverage (Debt), risk (σROA), tax (TAX), age (AG), ownership concentration (Conci), institutional ownership level (Inst), state ownership (Stat), and asset tangibility (TAN).

Accordingly, the results of the hypothesis estimations for the ROA (managed performance) section of the model are presented in the following table:

Table 5. Hypothesis Estimation Results – ROA (Managed Performance)

Equation	No.	Variable	Variable Name	Coef.	Z	p	Sign	Theory	Theory Accepted (5%)	Theory Adjusted	Final Theory
Performance Eq.	1	MAN-OWN	Managerial Ownership	0.2559	1.77	.076	+	Trade-off & Pecking Order	Rejected	Yes	Agency
	2	SIZE	Firm Size	0.0028	5.40	.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	3	PROFIT	Profitability	0.9106	87.25	.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	4	DEBT	Leverage	–0.0105	–9.03	.000	–	Trade-off & Pecking Order	Accepted	No	Trade-off
	5	SDROA	Risk	–0.0036	–0.47	.640	–	Trade-off & Pecking Order	Rejected	Yes	Agency
	6	TAX	Tax	–0.1084	–24.83	.000	–	Trade-off & Pecking Order	Accepted	No	Trade-off
	7	AG	Age	–0.00003	–0.84	.400	–	Trade-off & Pecking Order	Accepted	No	Trade-off
Ownership Eq.	1	ROA	Discretionary Performance	0.7395	83.04	.000	+				
	2	SIZE	Firm Size	–0.0043	–2.46	.014	–				
	3	DEBT	Leverage	0.0246	6.44	.000	+				
	4	SDROA	Risk	–0.1129	–4.73	.000	–				
	5	TAX	Tax	–0.0296	–2.14	.032	–				
	6	AG	Age	–0.0002	–1.61	.107	–				
	7	Conci	Ownership Concentration	–0.0197	–2.30	.021	–	Agency	Accepted	No	Agency
	8	Inst	Institutional Ownership	0.1137	14.62	.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	9	Stat	State Ownership	–0.0094	–1.90	.058	–	Trade-off & Pecking Order	Rejected	Yes	Trade-off
	10	TAN	Tangibility	–0.0018	–0.31	.757	–	Trade-off & Pecking Order	Rejected	Yes	Trade-off

1. The Z statistic for managerial ownership (MAN-OWN) is 1.77 with a p-value of 0.076. Since the p-value exceeds 0.05, the effect of managerial ownership on ROA (managed performance) is not statistically significant.
2. The Z statistic for firm size (SIZE) is 5.40 with a p-value of 0.000. Since the p-value is below 0.05, the effect of firm size on ROA is positive and statistically significant.

Table 6. Hypothesis Estimation Results – NDROA (Unmanaged Performance)

Equation	No.	Variable	Variable Name	Coef.	Z	p	Sign	Theory	Theory Accepted (5%)	Theory Adjusted	Final Theory
Performance Eq.	1	MAN-OWN NDROA	Managerial Ownership	0.1803	2.42	.016	+	Trade-off & Pecking Order	Accepted	No	Trade-off

	2	SIZE	Firm Size	0.0062	2.14	.032	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	3	PROFIT	Profitability	0.8225	14.96	.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	4	DEBT	Leverage	0.0154	2.26	.024	+	Agency	Accepted	No	Agency
	5	SDNDROA	Risk	0.1170	3.16	.002	+	Agency	Accepted	No	Agency
	6	TAX	Tax	–0.0706	–3.07	.002	–	Trade-off & Pecking Order	Accepted	No	Trade-off
	7	AG	Age	–0.0001	–0.51	.607	–	Trade-off & Pecking Order	Rejected	Yes	Agency
Ownership Eq.	1	NDROA	Non-Discretionary Perf.	0.7370	82.75	.000	+				
	2	SIZE	Firm Size	–0.0044	–2.38	.017	–				
	3	DEBT	Leverage	0.0204	5.42	.000	+				
	4	SDNDROA	Risk	–0.0985	–4.18	.000	–				
	5	TAX	Tax	–0.0160	–1.11	.269	–				
	6	AG	Age	–0.0002	–1.67	.094	–				
	7	Conci	Ownership Concentration	–0.0265	–2.92	.004	–	Agency	Accepted	No	Agency
	8	Inst	Institutional Ownership	0.1085	13.17	.000	+	Trade-off & Pecking Order	Accepted	No	Trade-off
	9	Stat	State Ownership	–0.0058	–1.09	.274	–	Trade-off & Pecking Order	Rejected	Yes	Agency
	10	TAN	Tangibility	0.0006	0.09	.927	+	Trade-off & Pecking Order	Rejected	Yes	Agency

1. The Z-statistic for the variable *managerial ownership (MAN-OWN)* is 2.42, and the p-value is 0.016. Since the p-value is below 5%, managerial ownership (MAN-OWN) has a statistically significant positive effect on *NDROA* (unmanaged performance).
2. The Z-statistic for the variable *firm size (SIZE)* is 2.14, and the p-value is 0.032. Since the p-value is below 5%, *firm size* has a statistically significant positive effect on *NDROA* (unmanaged performance).

Table 7. Main Hypotheses of Model 3: Comparison of ROA (Managed Performance) and NDROA (Unmanaged Performance)

No.	Variable	NDROA (Unmanaged Performance)				ROA (Managed Performance)				Comparison	
		p-value	Sign	Theory Accepted	Final Theory	*p-value*	Sign	Theory Accepted	Final Theory	Alignment	Earnings Management
1	MAN-OWN	0.016	+	Yes	Trade-off & Pecking	0.076	+	No	Agency	No	Yes (Earnings Managed)
2	SIZE	0.032	+	Yes	Trade-off & Pecking	0.000	+	Yes	Trade-off & Pecking	Yes	No
3	PROFIT	0.000	+	Yes	Trade-off & Pecking	0.000	+	Yes	Trade-off & Pecking	Yes	No
4	DEBT	0.024	+	Yes	Agency	0.000	–	Yes	Trade-off & Pecking	No	Yes (Earnings Managed)
5	SDNDROA	0.002	+	Yes	Agency	0.640	–	No	Agency	No	Yes (Earnings Managed)

6	TAX	0.002	–	Yes	Trade-off & Pecking	0.000	–	Yes	Trade-off & Pecking	Yes	No
7	AG	0.607	–	No	Agency	0.040	–	Yes	Trade-off & Pecking	No	Yes (Earnings Managed)
8	Conci	0.004	–	Yes	Agency	0.021	–	Yes	Agency	Yes	No
9	Inst	0.000	+	Yes	Trade-off & Pecking	0.000	+	Yes	Trade-off & Pecking	Yes	No
10	Stat	0.274	–	No	Agency	0.058	–	No	Trade-off & Pecking	No	Yes (Earnings Managed)
11	TAN	0.0926	+	No	Agency	0.757	–	No	Trade-off & Pecking	No	Yes (Earnings Managed)

3- Analysis and Interpretation of the Comparative Hypotheses of the Model (Comparison Between ROA [Managed Performance] and NDROA [Unmanaged Performance])

1. The Z-statistic for the variable "Managerial Ownership" (MAN-OWN) in the ROA model is 1.77, and the p-value is 0.076. Since the p-value is above 5%, managerial ownership does not have a statistically significant positive effect on ROA (managed performance). However, in the estimation of Model 3 under NDROA, the Z-statistic for MAN-OWN is 2.42, with a p-value of 0.016, indicating a statistically significant positive effect on ROA (unmanaged performance). Therefore, as reflected in the above table, managerial ownership exhibits divergent effects in managed and unmanaged performance models. In the managed performance model, a theory adjustment occurs, suggesting that managers, by leveraging their discretionary performance, attempt to reduce the visibility of managerial ownership to facilitate earnings management.
2. The Z-statistic for the variable "Firm Size" (SIZ) in the ROA model is 5.40, with a p-value of 0.000. Since the p-value is below 5%, firm size has a significant positive effect on ROA (managed performance). Similarly, in Model 3 under NDROA, the Z-statistic is 2.14, and the p-value is 0.032, again confirming a significant positive effect. Thus, as stated in the table, firm size has a consistent directional effect in both models, and no theoretical adjustment occurs. However, it appears that managers attempt to understate firm size when utilizing discretionary performance to opportunistically manage earnings.
3. The Z-statistic for the variable "Profitability" (PROFIT) in the ROA model is 87.25 with a p-value of 0.000, confirming a statistically significant positive impact on managed performance. In Model 3 under NDROA, the Z-statistic is 14.96, and the p-value is also 0.000, indicating a consistent significant positive effect. Thus, profitability demonstrates aligned directionality in both models, and no theory adjustment occurs. Managers do not appear to alter the firm's reported profitability via discretionary actions for opportunistic earnings management.
4. The Z-statistic for "Capital Structure" (DEBT) is -9.03 with a p-value of 0.000, indicating a statistically significant negative effect on ROA (managed performance). In contrast, under NDROA, the Z-statistic is 2.26 with a p-value of 0.024, confirming a statistically significant positive effect. Although capital structure is statistically significant in both cases, the direction of the regression coefficient differs. This suggests that managers, through discretionary actions, tend to understate capital structure to facilitate opportunistic earnings management, despite no theoretical adjustment occurring.
5. The Z-statistic for "Risk in Managed Performance" (SDROA) is -0.47 with a p-value of 0.000, indicating a significant negative impact on ROA (managed performance). However, in NDROA, the Z-statistic for "Risk in Unmanaged Performance" (SD NDROA) is 3.16 with a p-value of 0.002, suggesting a significant positive effect. These opposing directions indicate a lack of alignment, implying a theory adjustment in the managed model where managers intentionally understate firm risk for opportunistic earnings management.
6. The Z-statistic for "Tax" (TAX) in the managed model is -24.83 with a p-value of 0.000, suggesting a significant negative effect. Similarly, in the unmanaged model, the Z-statistic is -3.07 with a p-value of 0.002, again indicating a significant negative effect. This shows directional consistency across both models, with no theory adjustment observed. Managers appear to modestly increase reported tax to moderate the perception of earnings management.

7. The Z-statistic for "Firm Age" (AG) in the managed model is -0.84 with a p-value of 0.400, which is not statistically significant. In the unmanaged model, the Z-statistic is -0.51 with a p-value of 0.607, again showing no statistical significance. Despite both effects being non-significant, the directionality is inconsistent, and a theoretical adjustment is indicated. Managers may attempt to overstate firm age through discretionary performance to support opportunistic earnings management. In essence, firms with more years of experience are more likely to engage in such behavior.
8. The Z-statistic for "Institutional Ownership Concentration" (conci) in the managed model is -2.30 with a p-value of 0.021, indicating a statistically significant negative effect. In the unmanaged model, the Z-statistic is -2.92 with a p-value of 0.004, again indicating a negative effect. The consistent directionality suggests no theory adjustment occurs. However, managers may attempt to understate ownership concentration through discretionary performance for opportunistic earnings management.
9. The Z-statistic for "Institutional Ownership Level" (inst) in the managed model is -14.62 with a p-value of 0.000, indicating a significant negative effect. In the unmanaged model, the Z-statistic is 13.17 with a p-value of 0.000, again confirming a statistically significant effect. The directionality is aligned across both models, and no theory adjustment occurs. Managers do not appear to manipulate institutional ownership levels through discretionary performance.
10. The Z-statistic for "State Ownership" (stat) in the managed model is -1.90 with a p-value of 0.058, which is not statistically significant. In the unmanaged model, the Z-statistic is -1.09 with a p-value of 0.274, also not significant. The lack of alignment between these results suggests a theory adjustment occurs. Managers may overstate state ownership to facilitate opportunistic earnings management.
11. The Z-statistic for "Asset Tangibility" (TAN) in the managed model is -0.31 with a p-value of 0.757, indicating no significant effect. In the unmanaged model, the Z-statistic is 0.09 with a p-value of 0.0926, also not significant. Again, the directions differ, and a theory adjustment occurs. Managers may attempt to exaggerate asset tangibility in support of opportunistic earnings management.

Table 8: General Summary of the Comparative Hypothesis Estimation Results Including Coefficients and Significance Levels for Each Variable

Variable Name	Coefficient and Significance (Unmanaged Performance) NDROA	Coefficient and Significance (Managed Performance) ROA	Managerial Action (Increase/Decrease)	Manager's Directional Indication
Managerial Ownership	0.016	0.076	No Change	—
Firm Size	0.032	0.000	Decrease	▼
Profitability	0.000	0.000	No Change	—
Debt (Leverage)	0.024	Significant at 0.000, Negative	Decrease	▼
Firm Risk	0.002	Not significant (p = 0.640)	No Change	—
Tax	Significant at 0.002, Negative	Significant at 0.000, Negative	Increase	▲
Firm Age	Not significant (p = 0.607)	Significant at 0.0400, Negative	Increase	▲
Unmanaged Performance	0.000	0.000	—	—
Firm Size (Repeated)	0.017, Negative	0.014, Negative	Increase	▲
Debt (Repeated)	0.000	0.000	No Change	—
Firm Risk (Repeated)	0.000	Significant at 0.000, Negative	No Change	—
Tax (Repeated)	0.269, Negative	0.032, Negative	Increase	▲
Firm Age (Repeated)	0.094, Negative	0.107, Negative	Increase	▲
Ownership Concentration	0.004, Negative	0.021, Negative	Decrease	▼
Ownership Level	0.000	0.000	No Change	—
State Ownership	0.274, Negative	0.058, Negative	Increase	▲
Asset Tangibility	0.0926	0.757, Negative	Decrease	▼

- All p-values are interpreted based on the 5% significance level.
- Arrows (▲▼) indicate the direction of the variable's manipulation by management under discretionary (managed) performance.
- Where the variable is marked "No Change," there is no substantial difference in its behavior across NDROA and ROA models.
- When "Negative" or "Significant" is noted in description cells, it refers to the direction or statistical result of the regression coefficient.
- All statistical outputs reflect regression estimations aligned with comparative modeling under the NDROA vs. ROA framework.

A) Results Obtained from the Status of Iranian Firms Under Weak Managerial Ownership Conditions

1. Regression analysis results indicate that managers increased managerial ownership from 0.016 to 0.076 using discretionary performance.
2. Regression analysis results indicate that managers reduced firm size from 0.000 to 0.032 using discretionary performance.
3. Regression analysis results show that managers did not change profitability, which remained at 0.000, using discretionary performance.
4. Regression analysis results demonstrate that managers reduced firm debt from 0.024 to a significance level of 0.000 and a negative coefficient using discretionary performance.
5. Regression analysis results reveal that managers decreased firm risk from 0.002 to -0.640 using discretionary performance.
6. Regression analysis results indicate that managers increased corporate tax from -0.002 to 0.000 using discretionary performance.
7. Regression analysis results show that managers increased firm age from -0.607 to -0.0400 using discretionary performance.

B) Results Obtained from the Status of Iranian Firms with High Dependence on or Strong Managerial Ownership

1. Regression analysis results indicate that managers increased firm size from -0.017 to -0.014 using discretionary performance.
2. Regression analysis results show that managers maintained debt at 0.000 using discretionary performance.
3. Regression analysis results indicate that managers decreased firm risk, maintaining it at 0.000 using discretionary performance.
4. Regression analysis results reveal that managers reduced tax from -0.269 to -0.032 using discretionary performance.
5. Regression analysis results demonstrate that managers reduced firm age from -0.094 to -0.107 using discretionary performance.
6. Regression analysis results indicate that managers decreased ownership concentration from -0.004 to -0.021 using discretionary performance.
7. Regression analysis results show that managers maintained institutional ownership at 0.000 using discretionary performance.
8. Regression analysis results indicate that managers reduced state ownership from -0.274 to -0.058 using discretionary performance.
9. Regression analysis results reveal that managers decreased the growth in asset tangibility from 0.0926 to -0.757 using discretionary performance.

General Results of the Study

The general findings of this study are categorized into two groups of firms:

(1) Firms with low dependence on managerial ownership, i.e., weak managerial ownership; and

(2) Firms with high dependence on managerial ownership, i.e., strong managerial ownership.

A) Firms with Weak Managerial Ownership:

In such firms, the percentage of managerial ownership, firm age, and tax payments are lower, while firm size, leverage (debt), and risk are higher. Managers, through discretionary performance, attempt to portray higher managerial ownership, firm age, and tax payments, while presenting lower size, leverage, and risk.

B) Firms with Strong Managerial Ownership:

These firms typically exhibit lower size, tax, firm age, and state ownership but higher ownership concentration and greater asset tangibility. In these cases, managers, through discretionary performance and for the purpose of opportunistic earnings management, seek to overstate firm size, tax, age, and state ownership while concealing asset tangibility and ownership concentration.

Therefore, this study demonstrates that by leveraging both discretionary and non-discretionary performance measures, Iranian firms with weaker managerial and state ownership levels strategically alter their capital structure to enable opportunistic earnings management.

4. Discussion and Conclusion

The findings of this study offer significant insights into how ownership structure—particularly managerial ownership—affects both managed (ROA) and unmanaged (NDROA) performance in Iranian listed companies. The dual-model estimation confirms that managerial discretion plays a critical role in shaping reported performance, and this effect varies based on whether the ownership is weak or strong. More specifically, the results show that in firms with weak managerial ownership, discretionary performance is used to enhance indicators such as managerial ownership ratio, company age, and tax payments, while diminishing metrics such as firm size, leverage, and risk. Conversely, in companies with strong managerial ownership, managers tend to increase firm size, taxes, and government ownership in reported figures while downplaying ownership concentration and asset tangibility.

These results echo the theoretical predictions of both agency theory and stewardship theory. According to agency theory, when managerial ownership is low, managers lack sufficient alignment with shareholder interests and may engage in opportunistic earnings management to signal control or influence over firm outcomes (Mehrani et al., 2010; Namazi & Ebrahimi, 2013). Our findings align with this view: in low ownership environments, managers artificially inflate certain performance indicators through discretionary means, possibly to justify their strategic decisions or boost compensation-linked metrics. These behaviors are consistent with the evidence presented by Moradzadeh et al. (2009), who documented widespread earnings manipulation in Iranian firms with low institutional oversight (Moradzadeh et al., 2009).

In contrast, firms with strong managerial ownership showed a tendency to manipulate performance to mask asset tangibility and ownership concentration, possibly to deflect regulatory scrutiny or reduce investor intervention. This finding resonates with the observations made by Rafizadeh et al. (2023), who noted that managerial ownership exerts nonlinear effects on capital structure and dividend policy, with thresholds beyond which managerial entrenchment begins to distort decision-making (Rafizadeh et al., 2023). This implies that excessive managerial ownership does not necessarily lead to better alignment with shareholder goals but can instead promote opportunistic behavior, especially in markets where governance mechanisms are weak.

Our results regarding capital structure provide additional layers of understanding. For example, in both managerial ownership groups, discretionary manipulation was evident in variables related to debt and risk. Managers reduced perceived risk and leverage through discretionary performance indicators—suggesting an intentional strategy to present a more favorable financial profile. These findings support the earlier work by Hamidian et al. (2020), who demonstrated that managerial ownership can significantly impact capital structure decisions, often in ways that obscure the true financial standing of the firm (Hamidian et al., 2020). Likewise, the patterns observed are in line with the capital structure determinants identified by Haji Khan Mirzaei and Tohidloo (2021), where managerial motivations, rather than market-driven forces, often determine leverage strategies in listed Iranian firms (Haji Khan Mirzaei & Tohidloo, 2021).

Another significant insight from the study concerns taxation. In firms with weak ownership structures, managers increased the appearance of tax payments through discretionary performance, possibly to signal compliance and reduce regulatory risk. In strong ownership firms, managers reported increased taxes while manipulating other governance indicators. This finding aligns with the results of Najafi and Tootian Isfahani (2020), who found that strategic reporting choices are used by distressed firms to improve their appearance and manage stakeholder perceptions (Najafi & Tootian Isfahani, 2020). It also supports the findings of Roshan and Khodarahmi (2024), who highlighted that firms alter reported capital adequacy and risk indicators based on ownership and regulatory pressures (Roshan & Khodarahmi, 2024).

Board structure and corporate governance mechanisms also appear to mediate these relationships. In this study, the effects of discretionary performance manipulation were significantly shaped by variables such as government ownership, institutional ownership, and ownership concentration. Firms with stronger board control, often linked to higher institutional ownership, showed lower degrees of performance manipulation. This observation supports the findings of Sajadi et al. (2022), who noted

that robust board characteristics can mitigate the distortive effects of ownership structure on earnings classification (Sajadi et al., 2022). Furthermore, the results are consistent with Namazi and Monfared's (2011) arguments regarding how operational constraints in board structure influence firm transparency and managerial accountability (Namazi & Mohammad Monfared, 2011).

Interestingly, companies with high levels of state ownership showed increased tendencies for performance manipulation, possibly due to lower scrutiny and accountability. This supports earlier empirical observations by Namazi and Ebrahimi (2013), who found that state ownership negatively correlates with technical efficiency due to political interference and weak monitoring (Namazi & Ebrahimi, 2013). The present findings also reinforce the conclusions drawn by Yeganeh et al. (2008), who showed that institutional investors positively affect firm value only when they operate independently from state-affiliated entities (Yeganeh et al., 2008).

At a broader level, these results reflect the hybrid nature of Iranian capital markets, where firms are subject to both market-driven incentives and state-imposed constraints. The mixed motivations of managers—ranging from profit maximization to regulatory compliance—create an environment conducive to performance manipulation. Rajput et al. (2023) emphasized the need for integrative governance frameworks that bridge human resource management and financial performance, which seems particularly relevant in transitional economies like Iran (Rajput et al., 2023). Wang's (2023) model also supports the idea that ownership-performance linkages are moderated by contextual factors such as market maturity and regulatory effectiveness (Wang, 2023).

Finally, the dual-model (ROA vs. NDROA) approach adopted in this research underscores the methodological necessity of distinguishing between genuine and discretionary components of firm performance. As highlighted in Montaseri et al. (2021), performance is not a unidimensional concept and must be decomposed into its constituent elements to understand the underlying drivers (Montaseri et al., 2021). Our findings validate this methodological approach by showing that discretionary components vary systematically with ownership structure and other governance indicators.

This study, despite its robust analytical framework and dual-model estimation, is not without limitations. First, the sample is restricted to listed companies in the Tehran Stock Exchange, which may limit the generalizability of the findings to private or smaller firms. Second, although the NDROA model reduces the impact of managerial discretion, it cannot fully eliminate all forms of earnings manipulation, particularly those embedded in long-term accruals or intangible asset reporting. Third, some ownership categories such as foreign ownership, family ownership, and cross-holdings were not distinctly analyzed due to data constraints. Fourth, macroeconomic variables such as inflation or monetary policy shocks were not controlled for, which may influence capital structure decisions and performance metrics.

Future research should explore the impact of foreign and family ownership on managed versus unmanaged performance to examine whether these ownership types reinforce or constrain managerial discretion. Additionally, studies could expand the model by including qualitative governance factors such as board independence, CEO tenure, and ownership activism. Longitudinal studies using panel vector autoregression (PVAR) or dynamic panel data models like GMM could provide deeper insights into causality. Another valuable avenue would be the exploration of sector-specific effects, such as whether performance manipulation is more pronounced in capital-intensive industries compared to service sectors.

Policymakers and regulatory authorities should strengthen governance frameworks to limit earnings manipulation, especially in firms with concentrated or state ownership. Institutional investors should be encouraged to adopt active monitoring roles and demand transparency in financial reporting. Boards of directors should receive targeted training to better understand how discretionary reporting tools are used and how to detect opportunistic behavior. Auditors and financial analysts must also adjust their evaluation techniques to distinguish between managed and unmanaged performance, ensuring more accurate assessments of firm value and risk.

Ethical Considerations

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

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Conflict of Interest

The authors report no conflict of interest.

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