

The Impact of Earnings Management and Institutional Ownership on the Investment Efficiency of Companies Listed on the Tehran Stock Exchange

1. Masoumeh. Garaie[✉]: MA, Department of Accounting, Malayer Branch, Islamic Azad University, Malayer, Iran
2. Seyyed Yahya. Asadolahi[✉]: Department of Accounting, Mal.C., Islamic Azad University, Malayer, Iran
3. Hosein. Afshari[✉]: Department of Accounting, Mal.C., Islamic Azad University, Malayer, Iran

*corresponding author's email: asadolahi.yahya@iau.ac.ir

ABSTRACT

The primary objective of the present study is to determine the relationship between earnings management, institutional ownership, and firms' investment efficiency. To achieve this objective, three hypotheses were developed and tested using three multiple linear regression models estimated through the Generalized Least Squares (GLS) method and Quantile Regression analysis. For hypothesis testing, a sample of 195 companies was selected from firms listed on the Tehran Stock Exchange over a five-year period from 2018 to 2022 using a purposive elimination sampling method. The research data were collected using a panel data approach and statistically analyzed using Excel 2016 and EViews 13 software packages. The findings indicate that institutional ownership has a positive and statistically significant effect on investment efficiency. Furthermore, the results of the quantile regression analysis reveal that the effect of institutional ownership on investment efficiency is positive and significant in the first quartile. Another set of findings demonstrates that accrual-based earnings management has a negative and statistically significant effect on investment efficiency, and according to the quantile regression analysis, the impact of accrual-based earnings management on investment efficiency is negative and significant in the first quartile. Finally, additional results from the quantile regression analysis indicate a negative and statistically significant effect of institutional ownership on the relationship between accrual-based earnings management and investment efficiency in the second and third quartiles.

Keywords: Investment Efficiency, Institutional Ownership, Earnings Management.

Introduction

Investment efficiency is one of the central concerns of corporate finance and accounting research because it reflects the extent to which firms allocate financial resources to projects with positive net present value while avoiding both underinvestment and overinvestment. In capital markets, efficient investment is not only a firm-level performance issue but also a mechanism through which scarce financial resources are directed toward productive economic activities. When investment decisions are distorted by agency conflicts, information asymmetry, weak monitoring, or opportunistic financial reporting, firms may either reject valuable investment opportunities or allocate capital to inefficient projects. This problem is particularly important in emerging markets, where ownership concentration, institutional monitoring, regulatory quality, and information transparency may differ substantially from



Article history:
Received 03 February 2026
Revised 23 March 2026
Accepted 31 May 2026
Initial Publish 28 July 2026
Published online 01 November 2027

How to cite this article:

Garaie, M., Asadolahi, S. Y., & Afshari, H. (2026). The Impact of Earnings Management and Institutional Ownership on the Investment Efficiency of Companies Listed on the Tehran Stock Exchange. *Journal of Management and Business Solutions*, 5(6), 1-22. <https://doi.org/10.61838/jmbs.346>



developed markets. Recent evidence shows that information asymmetry has a direct bearing on investment efficiency and that blockholders can play an important role in reducing such inefficiencies by improving monitoring and constraining managerial discretion (1). Accordingly, understanding the factors that shape investment efficiency requires simultaneous attention to both financial reporting behavior and ownership structure.

Earnings management is one of the most important channels through which managerial opportunism can affect investment decisions. In accounting and corporate governance literature, earnings management generally refers to the deliberate use of accounting discretion or real operating decisions to alter reported earnings, often within the boundaries of accounting standards but in a manner that distorts the economic reality of the firm. The literature distinguishes between accrual-based earnings management and real earnings management; the former relies on accounting estimates and accrual choices, whereas the latter involves changes in actual business activities. A broad review of the literature indicates that earnings management is a persistent concern across institutional settings because it affects earnings quality, financial transparency, contracting, valuation, and stakeholders' trust in financial statements (2). When reported earnings become less informative, investors and creditors face greater uncertainty in evaluating firms' investment opportunities, and managers may gain wider discretion to pursue inefficient investment policies.

Accrual-based earnings management is especially relevant to investment efficiency because accruals are directly connected to the timing and recognition of revenues, expenses, assets, and liabilities. When accruals are manipulated, accounting numbers may no longer provide a reliable signal of operating performance and future cash flows. Studies on capital structure and earnings management show that firms may use accrual-based manipulation under financing pressures, debt constraints, and market expectations, suggesting that earnings management can be closely linked to external financing needs and investment behavior (3, 4). Evidence from Asian banking also indicates that managerial misbehavior can be reflected in discretionary accounting choices, such as loan loss provisions, further confirming that accounting discretion may be used strategically in environments where managerial incentives and monitoring mechanisms are imperfect (5). Therefore, earnings management may reduce investment efficiency by weakening the informational role of accounting reports and increasing agency costs.

The relationship between earnings quality and investment decisions is grounded in the broader idea that high-quality financial reporting reduces information asymmetry between managers and external capital providers. When financial statements faithfully represent firm performance, investors can better assess risk and expected returns, and managers face stronger external discipline. In contrast, low earnings quality increases the cost of equity capital and reduces the credibility of accounting information (6). External monitoring and ESG-related mechanisms may also alter the informational content of discretionary accruals, showing that accrual quality is not merely a technical accounting issue but is embedded in governance and market-monitoring systems (7). In this regard, financial reporting integrity becomes a necessary precondition for efficient investment, because investment decisions depend on the availability of credible information about firm resources, constraints, and opportunities.

Ownership structure is another major determinant of corporate decision-making and investment efficiency. Institutional ownership, blockholder ownership, foreign ownership, insider ownership, employee ownership, and common ownership may each create different monitoring incentives and agency outcomes. Institutional investors are generally expected to improve governance because they possess expertise, resources, and incentives to monitor managerial decisions. However, the monitoring role of institutional owners is not uniform. Some institutional investors are active monitors, while others may be passive, distracted, short-term oriented, or aligned with

controlling shareholders. Studies on institutional investor distraction show that when institutional investors are less attentive, managers may engage more extensively in earnings management, suggesting that the effectiveness of institutional monitoring depends on investors' attention and incentives (8). Similarly, research on pension fund monitoring demonstrates that institutional investors can influence corporate debt policy and managerial decisions when they have sufficient monitoring capacity (9).

Blockholders and large shareholders represent another important dimension of ownership structure. Multiple large shareholders can improve financial reporting quality by preventing excessive managerial discretion and by limiting the dominance of a single controlling shareholder (10). Evidence from Korea shows that blockholder dispersion may affect the informativeness of earnings, indicating that the distribution of ownership power among large shareholders can influence the quality of financial information available to investors (11). Similarly, blockholdings may shape dividend policy, stock returns, and return volatility, suggesting that concentrated ownership can influence both internal governance and market outcomes (12). Director blockholders may also affect abnormal accruals and inventory-related decisions, showing that ownership power held by board members can influence accounting behavior and operational choices (13). These findings imply that ownership concentration can either enhance monitoring or create new agency conflicts, depending on the identity, incentives, and governance role of shareholders.

Institutional ownership is closely related to earnings management because institutional investors may either constrain opportunistic reporting or tolerate it when their incentives are misaligned. Evidence from India indicates that institutional investors are associated with earnings quality and corporate cash holdings, suggesting that institutional ownership can affect managerial policies through monitoring and resource-allocation channels (14). In East African listed firms, board gender diversity and institutional ownership have been examined as governance mechanisms affecting earnings management, reflecting the growing importance of ownership structure in improving financial reporting quality in emerging markets (15). Comparative evidence from Chinese stocks in the U.S. cross-listing market further shows that institutional investors differ in their ability to monitor earnings management, and that the origin and characteristics of institutional investors matter for governance effectiveness (16). These studies support the argument that institutional ownership may reduce earnings management, but its effect is contingent on institutional context and investor characteristics.

Foreign institutional investors are also important because they may bring stronger governance practices, international monitoring experience, and pressure for higher disclosure quality. In Japan, the threat of exit by foreign institutional investors has been shown to influence income smoothing, suggesting that even non-blockholder foreign investors may discipline managerial reporting behavior through potential market exit (17). In Vietnam, foreign investor ownership has been associated with earnings manipulation, indicating that foreign ownership may affect the quality of financial reporting in emerging capital markets (18). However, the role of ownership structures can be complex in family businesses, where CEO overpower and real earnings manipulation may depend on the interaction between managerial dominance and ownership concentration (19). These findings highlight the need to examine ownership not merely as a percentage of shares but as a governance mechanism whose effectiveness depends on firm type, ownership identity, and institutional environment.

The literature also suggests that ownership structure affects broader corporate policies beyond earnings management. Common institutional ownership has been shown to influence corporate tax planning, indicating that institutional investors who hold shares across multiple firms may shape managerial decisions in areas beyond

financial reporting (20). Common ownership may also affect the value of cash holdings, suggesting that ownership links across firms can influence liquidity preferences and corporate financial policies (21). Furthermore, institutional investors may facilitate reporting comparability, which can improve the decision usefulness of accounting information for investors and analysts (22). These studies show that institutional ownership may improve the financial information environment, thereby indirectly supporting more efficient investment decisions.

At the same time, ownership mechanisms are not always beneficial. Insider ownership may create incentives for real earnings management when managers or insiders benefit from short-term performance manipulation (23). Non-executive employee ownership can influence financial reporting quality, indicating that broader employee participation in ownership may alter internal incentives and reporting behavior (24). Corporate restructuring is also affected by ownership structure, suggesting that ownership arrangements can influence strategic decisions during periods of organizational change (25). In addition, blockholders and debtholders may exert pressure on earnings management, especially in settings where firms face financing constraints or debt-related incentives (26). Therefore, the governance effect of ownership depends on whether ownership creates effective oversight, private benefits, pressure for short-term results, or conflicts among stakeholders.

The interaction between institutional ownership and earnings management is particularly important for investment efficiency. If institutional investors effectively monitor managers, they may weaken the negative effect of earnings management on investment decisions by reducing opportunistic discretion and improving reporting quality. However, if institutional owners are passive, distracted, or aligned with controlling insiders, they may fail to prevent earnings manipulation and inefficient investment. Research on ownership structure and earnings management in Vietnam shows that ownership composition can significantly affect earnings management practices, confirming that governance mechanisms are highly context-dependent (27). Evidence from Pakistan and the FTSE-350 also indicates that ownership structure is associated with earnings management, demonstrating that this relationship is observed across both emerging and developed markets (28). Moreover, studies from unstable economic and political environments show that corporate governance may constrain earnings management, although the effectiveness of governance mechanisms can be weakened by institutional instability (29).

The informational environment of the firm also shapes the relationship among ownership, earnings management, and investment efficiency. Stock liquidity and the tone of press releases affect how information is transmitted to the market, indicating that disclosure quality and market communication influence investors' interpretation of firm value (30). Common owners may even use the media strategically as an invisible governance tool, suggesting that ownership influence can extend beyond formal voting and monitoring channels into public information environments (31). Private in-house meetings between blockholder mutual funds and firms further show that institutional investors may obtain or influence information through direct engagement with management (32). These mechanisms can either improve monitoring and reduce information asymmetry or create unequal access to information, depending on regulatory safeguards and market transparency.

Corporate governance research has increasingly emphasized that ownership structure must be examined alongside financial reporting quality, distress risk, and capital-market outcomes. Corporate governance topics have expanded considerably in recent literature, reflecting the multidimensional role of governance in shaping transparency, accountability, and firm performance (33). Financial distress prediction may also be enhanced by governance variables, implying that ownership and governance structures can provide signals about firm risk and managerial behavior (34). In addition, contracts between firms and shareholders may create direct governance

mechanisms that influence disclosure, managerial accountability, and shareholder rights (35). These studies indicate that ownership is not merely a structural characteristic but a contractual and monitoring framework that can affect investment efficiency through multiple channels.

In emerging markets such as Iran, the relationship between earnings management, institutional ownership, and investment efficiency is especially significant because capital markets often face higher information asymmetry, concentrated ownership, limited analyst coverage, and varying levels of regulatory enforcement. In such contexts, accrual-based earnings management may have stronger consequences for resource allocation, while institutional ownership may either improve governance or reinforce concentrated control. Evidence from Egypt shows that real earnings management may vary by industry, suggesting that sectoral conditions and institutional settings can shape managerial manipulation practices (36). Similarly, evidence from Egypt on ownership structure and financial reporting integrity highlights the moderating role of earnings quality, supporting the view that ownership and reporting quality should be studied jointly rather than separately (37). These insights are highly relevant for Tehran Stock Exchange-listed firms, where governance mechanisms and reporting incentives may interact in distinctive ways.

Despite the growing literature on earnings management, institutional ownership, and governance, several gaps remain. First, many studies focus on the direct effect of ownership structure on earnings management or financial reporting quality, while fewer studies examine how these factors jointly affect investment efficiency. Second, the evidence from emerging markets remains mixed, especially regarding whether institutional ownership consistently improves monitoring. Third, traditional mean-based regressions may obscure heterogeneous effects across firms with different levels of investment efficiency. Quantile regression is therefore useful because it examines whether the effects of institutional ownership and accrual-based earnings management differ across the distribution of investment efficiency, rather than assuming a uniform average effect. This is important because firms with low, moderate, and high investment efficiency may respond differently to ownership monitoring and earnings manipulation.

Accordingly, building on the literature on earnings management, institutional ownership, financial reporting quality, and investment efficiency, the present study aims to examine the effect of institutional ownership and accrual-based earnings management on the investment efficiency of companies listed on the Tehran Stock Exchange and to determine whether institutional ownership moderates the relationship between accrual-based earnings management and investment efficiency during 2018–2022.

Methods and Materials

In terms of purpose, this study is classified as applied research, and in terms of research method, it is a descriptive study. Since the collected data relate to events that occurred in the past, the study is considered retrospective and ex post facto from a temporal perspective. Furthermore, due to the use of quantitative data, it falls within the category of quantitative research.

The research method employed in this study is correlational. Correlational research is one of the descriptive (non-experimental) research methods and refers to studies aimed at discovering or clarifying relationships among variables through the use of correlation analysis.

The theoretical foundations and literature review were compiled using the library research method. In addition, documentary analysis was employed to collect the required data. Financial information and research data were

obtained from companies' financial statements, the website of the Securities and Exchange Organization (CODAL), the website of the Research, Development, and Islamic Studies Management Center of the Securities and Exchange Organization, and financial databases such as Rahavard Novin.

The statistical population of this study consisted of companies listed on the Tehran Stock Exchange during the period 2018–2022. Due to the heterogeneity among some members of the population, purposive elimination (systematic) sampling was employed. The following criteria were considered for selecting the sample firms:

1. The company must have been listed on the Tehran Stock Exchange before the beginning of 2017.
2. The company's fiscal year-end must be March 20 (end of the Iranian fiscal year) and must not have changed during the study period.
3. Financial information for the entire study period (2018–2022) must be available.
4. The company's shares must not have experienced a trading suspension exceeding three months in any year during the study period.
5. The company must not belong to the financial intermediation sector, including investment companies, leasing companies, holding companies, banks, and insurance firms.

After applying the above criteria to the statistical population, 195 companies were selected as the final sample. Furthermore, given that panel data (cross-sectional and time-series data) were collected for 195 companies over a five-year period, the final sample size consisted of 975 firm-year observations.

To test the first research hypothesis regarding the positive effect of institutional ownership on investment efficiency, the following multiple linear regression model was estimated using Quantile Regression:

Regression Model (1)

$$INE_{i,t} = \alpha + \beta_1 INST_{i,t} + \beta_2 AGE_{i,t} + \beta_3 FS_{i,t} + \beta_4 OCF_{i,t} + \beta_5 LOSS_{i,t} + \beta_6 LEV_{i,t} + \beta_7 TANG_{i,t} + \beta_8 ZSC_{i,t} + \varepsilon_{i,t}$$

Where:

$$INE_{i,t}$$

= Investment efficiency of firm *i* in year *t*

$$INST_{i,t}$$

= Institutional ownership of firm *i* in year *t*

$$AGE_{i,t}$$

= Age of firm *i* in year *t*

$$FS_{i,t}$$

= Firm size of firm *i* in year *t*

$$OCF_{i,t}$$

= Operating cash flow of firm *i* in year *t*

$$LOSS_{i,t}$$

= Loss indicator of firm i in year t

$$LEV_{i,t}$$

= Financial leverage of firm i in year t

$$TANG_{i,t}$$

= Tangible assets of firm i in year t

$$ZSC_{i,t}$$

= Bankruptcy risk of firm i in year t

To test the second research hypothesis regarding the negative effect of accrual-based earnings management on investment efficiency, the following multiple linear regression model was estimated using Quantile Regression:

Regression Model (2)

$$INE_{i,t} = \alpha + \beta_1 EM_{i,t} + \beta_2 AGE_{i,t} + \beta_3 FS_{i,t} + \beta_4 OCF_{i,t} + \beta_5 LOSS_{i,t} + \beta_6 LEV_{i,t} + \beta_7 TANG_{i,t} + \beta_8 ZSC_{i,t} + \varepsilon_{i,t}$$

Where:

$$EM_{i,t}$$

= Accrual-based earnings management of firm i in year t

To test the third research hypothesis regarding the negative effect of institutional ownership on the relationship between accrual-based earnings management and investment efficiency, the following multiple linear regression model was estimated using Quantile Regression:

Regression Model (3)

$$INE_{i,t} = \alpha + \beta_1 EM_{i,t} + \beta_2 INST_{i,t} + \beta_3 (EM_{i,t} \times INST_{i,t}) + \beta_4 AGE_{i,t} + \beta_5 FS_{i,t} + \beta_6 OCF_{i,t} + \beta_7 LOSS_{i,t} + \beta_8 LEV_{i,t} + \beta_9 TANG_{i,t} + \beta_{10} ZSC_{i,t} + \varepsilon_{i,t}$$

In general, data used in empirical research can be classified into three categories. Time-series data are collected over a specific period and may be recorded at daily, weekly, monthly, quarterly, or annual intervals. Cross-sectional data are collected for one or more variables at a specific point in time. In most recent studies, panel data have been employed for analysis. Under this approach, multiple entities such as firms, households, or countries are examined over time. Panel data analysis provides a rich informational environment that facilitates the development of estimation techniques and generates more informative analytical results. In many cases, researchers rely on panel data when phenomena cannot be adequately examined using either purely time-series or purely cross-sectional data. To perform the required calculations, prepare the data, and conduct the statistical analyses, Microsoft Excel 2016 and EViews 13 software were utilized.

Findings and Results

Before analyzing the raw data, the descriptive statistics of the research data were first calculated. Table 1 presents the descriptive statistics of the continuous variables of the study. According to Table 1, the mean of the investment efficiency variable is 2.838, reaching a maximum of 4.610 and a minimum of -0.450. Its median is also equal to 3.000. The large distance between the median and the mean indicates that the distribution of this variable is not close to a normal distribution. Moreover, dispersion parameters are criteria for determining the extent to which data are dispersed from one another or from the mean. One of the most important dispersion parameters is the standard deviation. Among the research variables, bankruptcy risk (ZSC) has the highest standard deviation, while earnings management (EM) has the lowest standard deviation. The Jarque–Bera test statistic also indicates that, except for firm age (AGE), none of the continuous variables of the study follows a normal distribution.

Table 1. Descriptive Statistics of the Continuous Research Variables

Variable	Investment Efficiency	Earnings Management	Institutional Ownership	Firm Age	Firm Size	Operating Cash Flow	Financial Leverage	Tangible Assets	Bankruptcy Risk
Symbol	INE	EM	INST	AGE	FS	OCF	LEV	TANG	ZSC
Mean	2.838769	0.095764	0.681128	9.024062	15.65417	0.117241	0.489897	0.244246	4.620492
Median	3.000000	0.080000	0.710000	9.040000	15.43000	0.090000	0.490000	0.200000	4.130000
Maximum	4.610000	1.320000	0.990000	9.910000	21.57000	0.730000	1.510000	0.970000	47.78000
Minimum	-0.450000	0.000000	0.000000	7.900000	11.41000	-1.310000	0.010000	0.000000	-2.070000
Standard Deviation	1.025398	0.089039	0.198371	0.358961	1.600728	0.157146	0.221808	0.193048	3.472925
Skewness Coefficient	-0.728350	3.900648	-1.229491	0.121108	0.793950	-0.272002	0.306493	0.969215	4.924493
Kurtosis Coefficient	4.000620	41.77509	4.618674	3.296023	3.925514	10.47660	3.316560	3.456199	53.33087
Jarque–Bera Statistic	126.8807	63552.44	352.0844	5.943373	137.2313	2282.942	19.33594	161.1037	106851.8
Probability	0.000000	0.000000	0.000000	0.051217	0.000000	0.000000	0.000063	0.000000	0.000000
Sum	2767.800	93.37000	664.1000	8798.460	15262.82	114.3100	477.6500	238.1400	4504.980
Sum of Squared Deviations	1024.105	7.721806	38.32776	125.5027	2495.710	24.05268	47.91959	36.29862	11747.61
Number of Observations	975	975	975	975	975	975	975	975	975

The results obtained from the correlation coefficient test among the research variables at the 95% confidence level are presented in Table 2. Significant correlation coefficients are highlighted in the following table.

Table 2. Correlation Coefficients of the Research Variables

Variable	INE	EM	INST	AGE	FS	OCF	LOSS	LEV	TANG	ZSC
INE	1.000000									
t-statistic	-----									
Probability	-----									
EM	-0.040212	1.000000								
t-statistic	-3.955335	-----								
Probability	0.0000	-----								
INST	0.043284	0.053574	1.000000							
t-statistic	4.351425	1.673535	-----							
Probability	0.0000	0.0945	-----							
AGE	-0.051847	0.023381	-0.165315	1.000000						
t-statistic	-1.619445	0.729534	-5.228604	-----						
Probability	0.1057	0.4659	0.0000	-----						
FS	-0.055132	-0.055386	0.157913	-0.156887	1.000000					
t-statistic	-1.722345	-1.730308	4.988346	-4.955123	-----					
Probability	0.0853	0.0839	0.0000	0.0000	-----					
OCF	-0.022932	-0.117696	0.176663	-0.091897	0.039201	1.000000				
t-statistic	-0.715504	-3.696981	5.598692	-2.878734	1.223736	-----				
Probability	0.4745	0.0002	0.0000	0.0041	0.2213	-----				

LOSS	-0.016116	-0.048939	-0.044801	-0.023613	0.087766	-0.117937	1.000000		
t-statistic	-0.502784	-1.528373	-1.398876	-0.736771	2.748279	-3.704663	-----		
Probability	0.6152	0.1267	0.1622	0.4614	0.0061	0.0002	-----		
LEV	0.206800	-0.068082	0.080621	-0.112515	0.009264	-0.179979	0.316858	1.000000	
t-statistic	6.593223	-2.128608	2.523024	-3.532115	0.288994	-5.707283	10.42067	-----	
Probability	0.0000	0.0335	0.0118	0.0004	0.7726	0.0000	0.0000	-----	
TANG	-0.367436	-0.037670	-0.042056	-0.021486	0.011387	0.074585	0.102968	-0.086377	1.000000
t-statistic	-12.32347	-1.175866	-1.313019	-0.670374	0.355230	2.333015	3.229049	-2.704469	-----
Probability	0.0000	0.2399	0.1895	0.5028	0.7225	0.0199	0.0013	0.0070	-----
ZSC	0.098562	0.170142	0.018497	0.074851	-0.294758	0.169876	-0.231476	-0.286975	-0.194640
t-statistic	3.089493	5.385769	0.577085	2.341379	-9.621841	5.377096	-7.422001	-9.344663	-6.189784
Probability	0.0021	0.0000	0.5640	0.0194	0.0000	0.0000	0.0000	0.0000	0.0000

In this study, the Levin, Lin, and Chu stationarity test and the Phillips–Perron stationarity test were used to examine the stationarity of the research variables. The results are presented in Table 3. Based on the results of the Levin, Lin, and Chu stationarity test and the Phillips–Perron stationarity test in Table 3, since the probability value of the test statistic for all research variables is less than 0.05, the research variables were stationary at level during the study period. Therefore, the mean and variance of the variables over time and the covariance of the variables across different years were constant. Consequently, using these variables in the model does not lead to spurious regression.

Table 3. Results of the Stationarity Tests for the Research Variables

Variable	Symbol	Levin, Lin, and Chu Statistic	Levin, Lin, and Chu Probability	Phillips–Perron Statistic	Phillips–Perron Probability	Test Result	Stationarity Status	Order of Integration
Investment Efficiency	INE	-36.5411	0.0000	848.133	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Earnings Management	EM	-40.7266	0.0000	688.302	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Institutional Ownership	INST	-31.7703	0.0000	511.928	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Firm Age	AGE	-32.3485	0.0000	835.986	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Firm Size	FS	-33.5576	0.0000	742.503	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Operating Cash Flow	OCF	-111.696	0.0000	734.819	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Loss	LOSS	-5.79942	0.0000	20.9351	0.0073	Rejection of the null hypothesis	Stationary	I(0)
Financial Leverage	LEV	-70.6484	0.0000	604.302	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Tangible Assets	TANG	-28.1873	0.0000	570.899	0.0000	Rejection of the null hypothesis	Stationary	I(0)
Bankruptcy Risk	ZSC	-27.6493	0.0000	706.885	0.0000	Rejection of the null hypothesis	Stationary	I(0)

In estimating a model whose data are of the panel-data type, the type of estimation pattern must first be determined, namely whether the model under investigation falls into the category of pooled data or panel data. The results of the F-Limer (Chow) test are shown in Table 4. As observed in Table 4, the significance level (p-value) of the F-Limer (Chow) test for all research models is less than 0.05. Therefore, the null hypothesis of the F-Limer (Chow) test, which indicates equality of intercepts across all cross-sections, is rejected, and the panel-data method is used to estimate the research models.

Table 4. Results of the F-Limer (Chow) Test

Model	F-statistic	Significance Level	p-value	Test Result
First	1.525314	0.0001	p < 0.05	Panel data
Second	1.527787	0.0000	p < 0.05	Panel data
Third	1.539724	0.0000	p < 0.05	Panel data

If, based on the results of the F-Limer (Chow) test for each model, the use of the panel-data method is confirmed, the Hausman test is used to determine which method, fixed effects or random effects, is more appropriate for estimation, that is, to diagnose whether the differences among cross-sectional units are fixed or random. The Hausman test examines the following null and alternative hypotheses. The results of the Hausman test are presented in Table 5. As shown in Table 5, the significance level (p-value) of the Hausman test for the research models is less than 0.05. Therefore, the null hypothesis of the Hausman test is rejected, and the appropriate model for estimating the research models is the fixed-effects model.

Table 5. Results of the Hausman Test

Model	F-statistic	Significance Level	p-value	Test Result
First	31.145572	0.0001	$p < 0.05$	Fixed-effects model
Second	31.405528	0.0001	$p < 0.05$	Fixed-effects model
Third	33.390998	0.0002	$p < 0.05$	Fixed-effects model

To test the first research hypothesis regarding the effect of institutional ownership on investment efficiency, multiple linear regression model (1), estimated using quantile regression, was employed. The results of estimating Model 1 using Generalized Least Squares (GLS) on the mean of the dependent variable are presented in Table 6. Based on the results obtained from estimating regression Model 1, as shown in Table 6, the F-statistic, which indicates the overall significance of the regression, is 9.583499, and its corresponding p-value is 0.000000. This indicates that the model is significant at the 95% confidence level. The adjusted coefficient of determination is 0.640307, indicating that approximately 64% of the changes in the dependent variable can be explained by the independent variables of the model. Furthermore, the Durbin–Watson statistic is 2.33, which falls between 1.5 and 2.5, indicating the absence of first-order autocorrelation among the residuals of the model. In addition, as shown in Table 6, the coefficient of the institutional ownership variable (INST), namely β_1 , is 0.266849, and its significance level (Prob.) is 0.0355. Based on the t-statistic and the p-value associated with this variable, the results indicate that this coefficient is significant at the 5% error level. In other words, institutional ownership (INST) has a positive and significant effect on investment efficiency (INE). Therefore, the first hypothesis is confirmed at the 95% confidence level.

Table 6. Results of Estimating Model 1 Using Generalized Least Squares (GLS)

Dependent Variable: Investment Efficiency (INE)

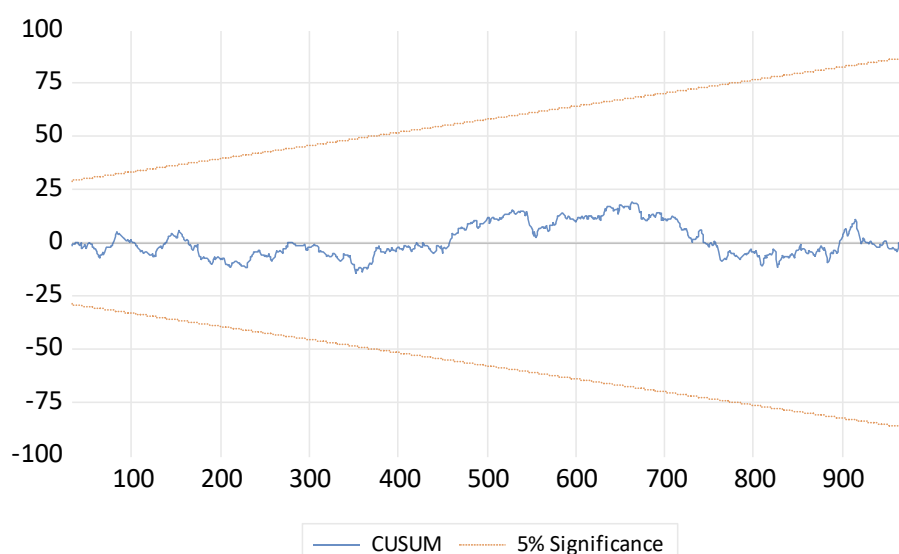
Variable	Coefficient Symbol	Coefficient	Standard Error	t-statistic	p-value	Result
Intercept	C / β_0	17.39471	2.254102	7.716912	0.0000	Significant
Institutional Ownership	$INST / \beta_1$	0.266849	0.126686	2.106386	0.0355	Significant
Firm Age	AGE / β_2	-1.441634	0.283791	-5.079915	0.0000	Significant
Firm Size	FS / β_3	-0.098779	0.027808	-3.552135	0.0004	Significant
Operating Cash Flow	OCF / β_4	-0.004434	0.107208	-0.041363	0.9670	Not significant
Loss	$LOSS / \beta_5$	0.018899	0.092202	0.204976	0.8376	Not significant
Financial Leverage	LEV / β_6	1.263827	0.100469	12.57926	0.0000	Significant
Tangible Assets	$TANG / \beta_7$	-2.484952	0.178714	-13.90459	0.0000	Significant
Bankruptcy Risk	ZSC / β_8	0.011427	0.005401	2.115763	0.0347	Significant
Durbin–Watson Statistic		2.336346	F-statistic	9.583499		
Adjusted R-squared		0.640307	Prob(F-statistic)	0.000000		

The results of the Wald test for testing whether the coefficients obtained from the estimation of regression Model 1 are equal to zero are presented in Table 7. According to Table 7, the Wald test results indicate the validity and significance of all estimated coefficients of Model 1. Therefore, the null hypothesis of the Wald test, which states that all coefficients of Model 1 are equal to zero, is rejected at the 0.05 significance level.

Table 7. Results of the Wald Test for Model 1

F-statistic	Probability	Result
13179.92	0.0000	Coefficients are not zero

To test the stability of the estimated coefficients of Model 1, recursive residual correlation models were used. Recursive models are conducted in two forms: the Cumulative Sum of Recursive Residuals (CUSUM) test and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) test. The results of the CUSUM test for examining the stability of the estimated coefficients of Model 1 over time are presented in Figure 1. In the CUSUM test, the statistics fall within the 95% confidence intervals; therefore, the null hypothesis of coefficient stability is not rejected, and at the 95% confidence level, the results obtained from estimating the following model are reliable and valid.

**Figure 1. Cumulative Sum of Recursive Residuals (CUSUM) for Model 1**

On the other hand, in econometrics, depending on the type of research and the data used, there are various methods for using panel data. To conduct further analysis, this study also examines the effect of institutional ownership (INST) on investment efficiency (INE) at different quartiles using the Quantile Regression (QR) method. Unlike Ordinary Least Squares (OLS) or Generalized Least Squares (GLS) regression, Quantile Regression (QR) examines the marginal effect of explanatory variables on the dependent variable at different points of the distribution, not merely at the mean. Quantile Regression (QR) has several advantages over Ordinary Least Squares (OLS), including lower sensitivity to outliers. Its estimates are also robust to non-normality and remain robust in the presence of heteroskedasticity. The results of estimating Research Model 1 using Quantile Regression (QR) are presented in Table 8.

Table 8. Results of Estimating Model 1 Using Quantile Regression (QR)

Dependent Variable: Investment Efficiency (INE)

Variable	Quantile	Coefficient	Standard Error	t-statistic	Probability	Result
INST	0.250	0.372269	0.143068	2.602050	0.0094	Significant
INST	0.500	0.015202	0.192885	0.078815	0.9372	Not significant
INST	0.750	0.203188	0.218228	0.931081	0.3521	Not significant

As shown in Table 8, the coefficient of the institutional ownership variable (INST) is not significant in the second and third quartiles of investment efficiency (INE). The results of estimating Model 1 across different deciles of investment efficiency (INE) are presented in Figure 2.

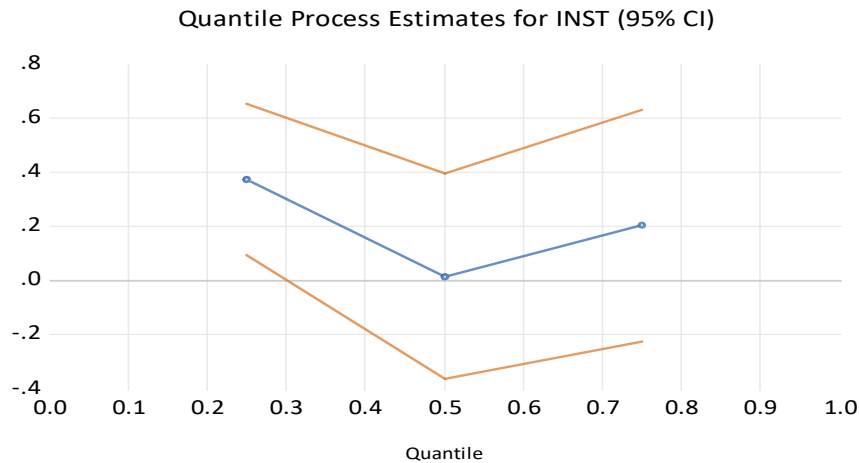


Figure 2. Estimation of Model 1 Across Different Deciles

To test the second research hypothesis regarding the effect of accrual-based earnings management on investment efficiency, multiple linear regression model (2), estimated using quantile regression, was employed. The results of estimating Model 2 using Generalized Least Squares (GLS) on the mean of the dependent variable are presented in Table 9. Based on the results obtained from estimating regression Model 2, as shown in Table 9, the F-statistic, which indicates the overall significance of the regression, is 9.991395, and its corresponding p-value is 0.000000. This indicates that the model is significant at the 95% confidence level. The adjusted coefficient of determination is 0.650929, indicating that approximately 65% of the changes in the dependent variable can be explained by the independent variables of the model. Furthermore, the Durbin–Watson statistic is 2.31, which falls between 1.5 and 2.5, indicating the absence of first-order autocorrelation among the residuals of the model.

In addition, as shown in Table 9, the coefficient of the accrual-based earnings management variable (EM), namely β_1 , is -0.455633, and its significance level (Prob.) is 0.0020. Based on the t-statistic and the p-value associated with this variable, the results indicate that this coefficient is significant at the 5% error level. In other words, accrual-based earnings management (EM) has a negative and significant effect on investment efficiency (INE). Therefore, the second hypothesis is confirmed at the 95% confidence level.

Table 9. Results of Estimating Model 2

Dependent Variable: Investment Efficiency (INE)

Variable	Coefficient Symbol	Coefficient	Standard Error	t-statistic	p-value	Result
Intercept	C / β_0	11.95305	2.073820	5.763783	0.0000	Significant
Accrual-Based Earnings Management	EM / β_1	-0.455633	0.147081	-3.097845	0.0020	Significant
Firm Age	AGE / β_2	-0.803226	0.268916	-2.986899	0.0029	Significant
Firm Size	FS / β_3	-0.125271	0.028845	-4.342861	0.0000	Significant
Operating Cash Flow	OCF / β_4	-0.137258	0.095558	-1.436375	0.1513	Not significant
Loss	$LOSS / \beta_5$	-0.010701	0.085156	-0.125661	0.9000	Not significant
Financial Leverage	LEV / β_6	1.418785	0.099744	14.22432	0.0000	Significant
Tangible Assets	$TANG / \beta_7$	-2.414695	0.169926	-14.21031	0.0000	Significant
Bankruptcy Risk	ZSC / β_8	0.010851	0.005493	1.975554	0.0486	Significant
Durbin–Watson Statistic		2.315840	F-statistic	9.991395		
Adjusted R-squared		0.650929	Prob(F-statistic)	0.000000		

The results of the Wald test for testing whether the coefficients obtained from the estimation of regression Model 2 are equal to zero are presented in Table 10. According to Table 10, the Wald test results indicate the validity and significance of all estimated coefficients of Model 2. Therefore, the null hypothesis of the Wald test, which states that all coefficients of Model 2 are equal to zero, is rejected at the 0.05 significance level.

Table 10. Results of the Wald Test for Model 2

F-statistic	Probability	Result
12806.62	0.0000	Coefficients are not zero

The results of the Cumulative Sum of Recursive Residuals (CUSUM) test for examining the stability of the estimated coefficients of Model 2 over time are presented in Figure 3. In the CUSUM test, the statistics fall within the 95% confidence intervals; therefore, the null hypothesis of coefficient stability is not rejected, and at the 95% confidence level, the results obtained from estimating the following model are reliable and valid.

**Figure 3. Cumulative Sum of Recursive Residuals (CUSUM) for Model 2**

On the other hand, the results of estimating Research Model 2 using Quantile Regression (QR) are presented in Table 11.

Table 11. Results of Estimating Model 2 Using Quantile Regression (QR)

Dependent Variable: Investment Efficiency (INE)

Variable	Quantile	Coefficient	Standard Error	t-statistic	Probability	Result
EM	0.250	-0.639823	0.309191	-2.069349	0.0388	Significant
EM	0.500	-0.276724	0.293046	-0.944301	0.3453	Not significant
EM	0.750	-0.051058	0.329268	-0.155066	0.8768	Not significant

As shown in Table 11, the coefficient of the earnings management variable (EM) is not significant in the second and third quartiles of investment efficiency (INE). The results of estimating Model 2 across different deciles of investment efficiency (INE) are presented in Figure 4.

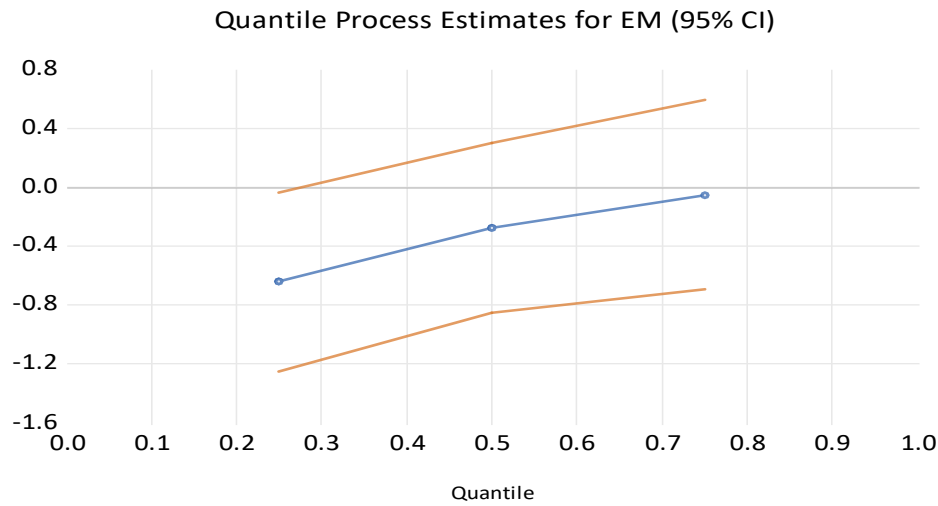


Figure 4. Estimation of Model 2 Across Different Deciles

To test the third research hypothesis regarding the effect of institutional ownership on the relationship between accrual-based earnings management and investment efficiency, multiple linear regression model (3), estimated using quantile regression, was employed. The results of estimating Model 3 using Generalized Least Squares (GLS) on the mean of the dependent variable are presented in Table 12. Based on the results obtained from estimating regression Model 3, as shown in Table 12, the F-statistic, which indicates the overall significance of the regression, is 9.467262, and its corresponding p-value is 0.000000. This indicates that the model is significant at the 95% confidence level. The adjusted coefficient of determination is 0.639436, indicating that approximately 64% of the changes in the dependent variable can be explained by the independent variables of the model. Furthermore, the Durbin–Watson statistic is 2.32, which falls between 1.5 and 2.5, indicating the absence of first-order autocorrelation among the residuals of the model.

In addition, as shown in Table 12, the coefficient of the interaction term between accrual-based earnings management and institutional ownership ($EM \times INST$), namely β_3 , is -0.282863, and its significance level (Prob.) is 0.7312. Based on the t-statistic and the p-value associated with this variable, the results indicate that this coefficient is not significant at the 5% error level. In other words, institutional ownership (INST) does not have a significant effect on the relationship between accrual-based earnings management (EM) and investment efficiency (INE). Therefore, the third hypothesis is not confirmed at the 95% confidence level.

Table 12. Results of Estimating Model 3

Dependent Variable: Investment Efficiency (INE)

Variable	Coefficient Symbol	Coefficient	Standard Error	t-statistic	p-value	Result
Intercept	C / β_0	13.99636	2.538144	5.514407	0.0000	Significant
Accrual-Based Earnings Management	EM / β_1	-0.490154	0.257248	-1.905373	0.0571	Not significant
Institutional Ownership	$INST / \beta_2$	0.250225	0.142378	1.757470	0.0792	Not significant
Interaction between Accrual-Based Earnings Management and Institutional Ownership	$EM \times INST / \beta_3$	-0.282863	0.823046	-0.343678	0.7312	Not significant
Firm Age	AGE / β_4	-1.015778	0.320855	-3.165842	0.0016	Significant
Firm Size	FS / β_5	-0.127611	0.030781	-4.145698	0.0000	Significant
Operating Cash Flow	OCF / β_6	-0.156063	0.106364	-1.467257	0.1427	Not significant
Loss	$LOSS / \beta_7$	-0.008196	0.095618	-0.085719	0.9317	Not significant
Financial Leverage	LEV / β_8	1.373836	0.101919	13.47970	0.0000	Significant

Tangible Assets	TANG / β_9	-2.465807	0.172060	-14.33109	0.0000	Significant
Bankruptcy Risk	ZSC / β_{10}	0.012164	0.005612	2.167439	0.0305	Significant
Durbin–Watson Statistic		2.326283	F-statistic	9.467262		
Adjusted R-squared		0.639436	Prob(F-statistic)	0.000000		

The results of the Wald test for testing whether the coefficients obtained from the estimation of regression Model 3 are equal to zero are presented in Table 13. According to Table 13, the Wald test results indicate the validity and significance of all estimated coefficients of Model 3. Therefore, the null hypothesis of the Wald test, which states that all coefficients of Model 3 are equal to zero, is rejected at the 0.05 significance level.

Table 13. Results of the Wald Test for Model 3

F-statistic	Probability	Result
10300.80	0.0000	Coefficients are not zero

The results of the Cumulative Sum of Recursive Residuals (CUSUM) test for examining the stability of the estimated coefficients of Model 3 over time are presented in Figure 5. In the CUSUM test, the statistics fall within the 95% confidence intervals; therefore, the null hypothesis of coefficient stability is not rejected, and at the 95% confidence level, the results obtained from estimating the following model are reliable and valid.

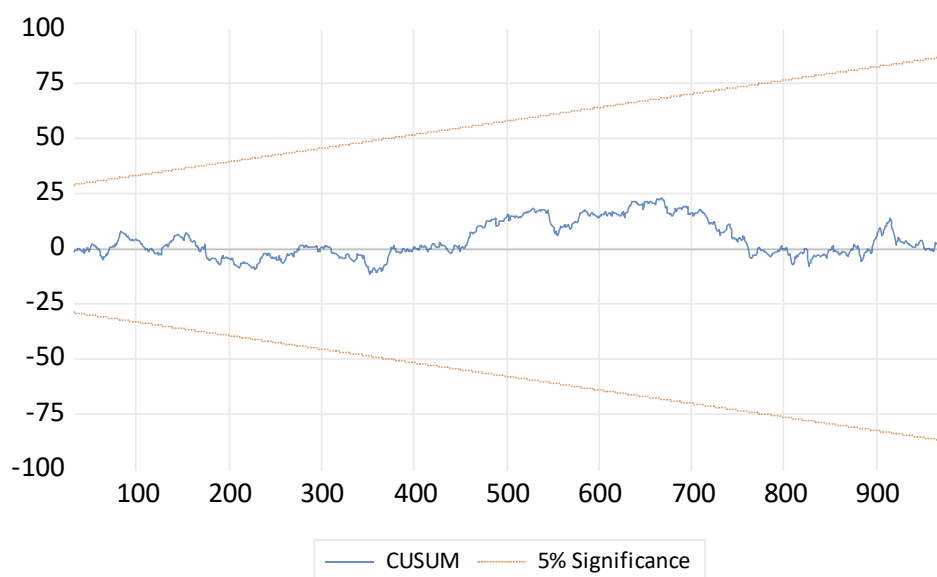


Figure 5. Cumulative Sum of Recursive Residuals (CUSUM) for Model 3

On the other hand, the results of estimating Research Model 3 using Quantile Regression (QR) are presented in Table 14.

Table 14. Results of Estimating Model 3 Using Quantile Regression (QR)

Dependent Variable: Investment Efficiency (INE)

Variable	Quantile	Coefficient	Standard Error	t-statistic	Probability	Result
EM × INST	0.250	-2.459499	1.826855	-1.346303	0.1785	Not significant
EM × INST	0.500	-6.544391	2.471679	-2.647751	0.0082	Significant
EM × INST	0.750	-4.567705	2.215444	-2.061756	0.0395	Significant

As shown in Table 14, the coefficient of the interaction term between accrual-based earnings management and institutional ownership (EM × INST) is not significant in the first quartile of investment efficiency (INE). Furthermore,

the effect of institutional ownership (INST) on the relationship between accrual-based earnings management (EM) and investment efficiency (INE) is decreasing in the second and third quartiles. The results of estimating Model 3 across different deciles of investment efficiency (INE) are presented in Figure 6.

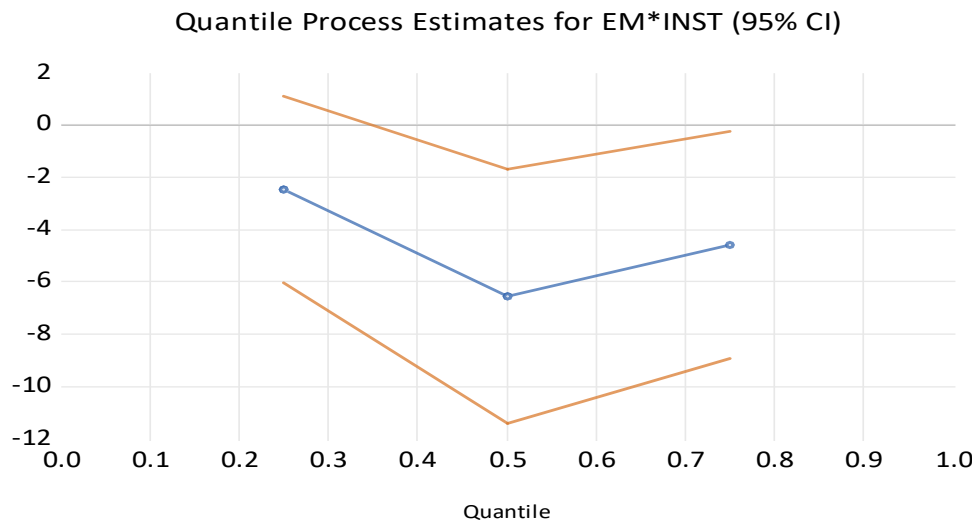


Figure 6. Estimation of Model 3 Across Different Deciles

Discussion and Conclusion

The findings of the present study provide important evidence regarding the relationship between institutional ownership, accrual-based earnings management, and investment efficiency among companies listed on the Tehran Stock Exchange. The first hypothesis proposed that institutional ownership has a positive effect on investment efficiency. The empirical results obtained from the generalized least squares (GLS) estimation confirmed this hypothesis, indicating that institutional ownership significantly enhances investment efficiency. Furthermore, the quantile regression results revealed that the positive effect of institutional ownership is particularly significant in the first quartile of investment efficiency, while the relationship loses significance in the higher quartiles. This finding suggests that institutional investors play a more influential monitoring role in firms characterized by lower levels of investment efficiency. In such firms, institutional owners appear to reduce agency conflicts, improve oversight over managerial decisions, and encourage the allocation of resources toward value-creating projects. The result is consistent with the theoretical perspective that institutional investors possess superior monitoring capabilities and can mitigate information asymmetry between managers and shareholders. These findings align with studies demonstrating that institutional investors improve governance quality and corporate decision-making through active monitoring and oversight mechanisms (9, 14, 16). They are also consistent with evidence indicating that blockholders and large institutional shareholders contribute to more effective corporate governance and better allocation of corporate resources (1, 10, 12). Moreover, the positive role of institutional ownership in improving the information environment and enhancing reporting comparability may facilitate more efficient investment decisions by reducing uncertainty surrounding corporate performance (22). The findings also support the argument that institutional ownership acts as an external governance mechanism capable of constraining managerial opportunism and encouraging long-term value creation (20, 21).

The stronger effect of institutional ownership in the lower quantile of investment efficiency deserves particular attention. Firms with weak investment efficiency are generally more vulnerable to agency problems, managerial

discretion, and informational opacity. Under such conditions, institutional investors may have greater opportunities to create value through monitoring activities. As firms become more efficient, the marginal contribution of institutional ownership declines because governance systems are already functioning more effectively. This explanation is consistent with studies suggesting that institutional investors are especially valuable in settings characterized by greater governance deficiencies and information asymmetry (6, 7). Similarly, research on institutional investor distraction demonstrates that when institutional monitoring is weakened, managerial opportunism increases, implying that the presence of attentive institutional investors is particularly important for firms facing governance challenges (8). Therefore, the quantile regression findings suggest that institutional ownership contributes most strongly where monitoring needs are greatest.

The second hypothesis proposed that accrual-based earnings management negatively affects investment efficiency. The results strongly support this hypothesis. The GLS estimation showed a significant negative relationship between earnings management and investment efficiency, while the quantile regression analysis indicated that this effect is significant primarily in the first quartile of investment efficiency. These findings imply that managerial manipulation of accounting accruals reduces the quality of information available to investors and other stakeholders, leading to inefficient investment decisions. When earnings are manipulated, managers may conceal poor investment opportunities, exaggerate expected returns, or obscure operational inefficiencies. As a result, capital may be allocated to projects that do not maximize shareholder value. This interpretation is highly consistent with the information asymmetry perspective, which argues that distorted financial reporting weakens the ability of capital markets to allocate resources efficiently.

The negative association between accrual-based earnings management and investment efficiency is supported by a substantial body of prior research. Previous studies have documented that earnings management diminishes earnings quality, reduces reporting credibility, and increases uncertainty for investors and creditors (2, 6). Research conducted in Pakistan and Vietnam has shown that accrual-based earnings management is frequently associated with financing pressures, agency conflicts, and distortions in corporate decision-making processes (3, 4). Likewise, evidence from Egypt indicates that earnings manipulation alters managerial behavior and influences resource allocation decisions across industries (36). Studies examining managerial misconduct through accounting choices have similarly demonstrated that earnings manipulation reflects opportunistic behavior that can weaken corporate performance and reduce stakeholder confidence (5). The present findings therefore reinforce the argument that high-quality financial reporting is an essential prerequisite for efficient investment decision-making.

The quantile regression results also provide additional insights regarding the heterogeneous effects of earnings management. The fact that the negative impact is concentrated in the lowest investment-efficiency quartile suggests that firms already experiencing inefficient investment are more susceptible to the harmful consequences of earnings manipulation. In highly efficient firms, internal governance systems, analyst coverage, and monitoring mechanisms may partially offset the adverse effects of earnings management. In contrast, firms operating with lower investment efficiency may lack such safeguards, making them particularly vulnerable to informational distortions. This interpretation is consistent with studies emphasizing the importance of governance quality, monitoring intensity, and ownership structure in determining the consequences of earnings management (29, 34, 37). Consequently, the findings suggest that the detrimental effects of earnings management are not uniform across firms but depend on the broader governance environment in which firms operate.

The third hypothesis examined whether institutional ownership moderates the relationship between accrual-based earnings management and investment efficiency. The GLS results did not provide support for this hypothesis when the average effect across all firms was considered. The interaction term between institutional ownership and earnings management was not statistically significant in the mean regression model. However, the quantile regression analysis revealed a more nuanced pattern. Specifically, institutional ownership exerted a significant negative moderating effect on the relationship between earnings management and investment efficiency in the second and third quartiles of investment efficiency. This finding indicates that institutional ownership weakens the adverse impact of earnings management on investment efficiency among firms with moderate and relatively high levels of investment efficiency.

The divergence between the GLS and quantile regression results highlights the importance of considering heterogeneity across firms. Traditional mean-based models assume that relationships are constant throughout the distribution of the dependent variable, whereas quantile regression allows the effects to vary across different levels of investment efficiency. The present findings suggest that institutional ownership does not uniformly moderate the consequences of earnings management across all firms. Instead, its monitoring effectiveness becomes more pronounced among firms operating at moderate and higher efficiency levels. One possible explanation is that institutional investors require a minimum level of organizational transparency, governance quality, and managerial responsiveness before their monitoring activities can effectively constrain opportunistic reporting behavior. In firms characterized by extremely low efficiency, governance weaknesses may be so substantial that institutional ownership alone cannot offset the adverse effects of earnings manipulation.

These results are generally consistent with prior studies emphasizing the monitoring role of institutional investors in limiting opportunistic financial reporting. Research conducted in China, India, and East Africa has shown that institutional investors can reduce earnings management through active monitoring and governance engagement (14-16). Evidence regarding foreign institutional investors also suggests that institutional ownership can influence reporting behavior and improve financial reporting quality (17, 18). Similarly, studies examining ownership structures have found that ownership concentration and monitoring by large shareholders can reduce abnormal accruals and improve reporting quality (10, 13). The current findings extend this literature by demonstrating that institutional ownership not only influences earnings management directly but also alters the extent to which earnings management affects investment outcomes.

At a broader theoretical level, the findings support agency theory and information asymmetry theory. Agency theory suggests that conflicts between managers and shareholders create incentives for managers to pursue personal interests at the expense of shareholder wealth. Institutional ownership mitigates these conflicts through enhanced monitoring, while earnings management exacerbates them by reducing transparency. The positive effect of institutional ownership and the negative effect of earnings management observed in this study are fully consistent with these theoretical expectations. Information asymmetry theory similarly predicts that inefficient investment arises when market participants lack reliable information about firm performance. Earnings management increases information asymmetry, whereas institutional ownership can reduce it through oversight, monitoring, and pressure for higher-quality disclosure. Consequently, the observed relationships provide empirical support for both theoretical frameworks.

The findings also contribute to the growing literature on ownership structure and financial reporting quality. Several studies have shown that ownership arrangements influence reporting integrity, governance effectiveness,

and managerial decision-making (24, 25, 28). Research on blockholder influence, shareholder contracts, and common ownership similarly emphasizes the importance of ownership mechanisms in shaping corporate outcomes (31, 32, 35). The present study extends this body of knowledge by linking ownership structure not only to reporting behavior but also to investment efficiency, thereby demonstrating how governance mechanisms ultimately affect the allocation of corporate resources.

Overall, the evidence indicates that institutional ownership serves as an effective governance mechanism capable of enhancing investment efficiency, while accrual-based earnings management undermines efficient resource allocation. Moreover, institutional ownership can partially mitigate the adverse consequences of earnings management under specific conditions, particularly among firms operating at moderate and higher levels of investment efficiency. These findings underscore the importance of strengthening institutional monitoring and improving financial reporting quality in order to promote efficient investment and sustainable corporate performance.

One limitation of this study is that it focuses exclusively on companies listed on the Tehran Stock Exchange, which may limit the generalizability of the findings to other institutional and regulatory environments. In addition, the study measures earnings management primarily through accrual-based indicators and does not explicitly consider real earnings management practices. Furthermore, institutional ownership is treated as a relatively homogeneous category, although different types of institutional investors may possess different objectives, monitoring incentives, and governance capabilities. The study period is also limited to five years, which may not fully capture long-term changes in ownership structures and investment behavior.

Future research could examine the role of different categories of institutional investors, such as pension funds, mutual funds, governmental institutions, and foreign investors, in influencing investment efficiency. Researchers may also investigate the interaction between real earnings management and accrual-based earnings management to determine whether their effects on investment efficiency differ. Additional studies could employ longer time horizons, compare multiple capital markets, or incorporate corporate governance characteristics such as board independence, audit quality, and ownership concentration. The use of advanced econometric techniques and dynamic panel models may also provide deeper insights into the causal relationships among ownership structure, earnings management, and investment efficiency.

From a practical perspective, regulators should continue strengthening disclosure requirements and financial reporting standards to reduce opportunities for earnings manipulation. Corporate boards should encourage greater participation by active institutional investors and enhance governance mechanisms that improve transparency and accountability. Investors may benefit from evaluating both ownership structure and earnings quality when assessing firms' investment prospects. Finally, corporate managers should recognize that transparent financial reporting and effective governance systems contribute not only to regulatory compliance but also to more efficient investment decisions and long-term value creation.

Acknowledgments

We would like to express our appreciation and gratitude to all those who helped us carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

References

1. Khan MA, Yau JT, Sarang AAA, Gull AA, Javed M. Information Asymmetry And investment Efficiency: The role of Blockholders. *Journal of Applied Accounting Research*. 2024;26(1):194-221. doi: 10.1108/jaar-05-2023-0123.
2. Dokas I, Leontidis C, Eriotis N, Hazakis KJ. Earnings Management. An Overview of the Relative Literature. 2021. doi: 10.47260/bae/823.
3. Naz A, Sheikh NA. Capital Structure and Earnings Management: Evidence From Pakistan. *International Journal of Accounting and Information Management*. 2022;31(1):128-47. doi: 10.1108/ijaim-08-2022-0163.
4. Hieu PD, Anh HH. Capital Structure and Practices of Accrual-Based Earnings Management Among Non-Financial Vietnamese Listed Firms. *Investment Management and Financial Innovations*. 2023;20(4):182-93. doi: 10.21511/imfi.20(4).2023.16.
5. Saona P, Azad MAK. Examining Managerial Misbehavior in Asian Banks Through Loan Loss Provisions*☆. *Asia-Pacific Journal of Financial Studies*. 2020;49(4):581-624. doi: 10.1111/ajfs.12307.
6. Ahmed AH, Tahat Y, Eliwa Y, Burton B. Earnings Quality and the Cost of Equity Capital: Evidence on the Impact of Legal Background. *International Journal of Accounting and Information Management*. 2021;29(4):631-50. doi: 10.1108/ijaim-05-2021-0092.
7. Hong KJ, Kim J, Kwack SY. External Monitoring, ESG, and Information Content of Discretionary Accruals. *Sustainability*. 2022;14(13):7599. doi: 10.3390/su14137599.
8. Garel A, Martín-Flores JM, Petit-Romec A, Scott A. Institutional Investor Distraction and Earnings Management. *Journal of Corporate Finance*. 2021;66:101801. doi: 10.1016/j.jcorpfin.2020.101801.
9. Choi W, Chung CY, Park J. Pension Fund Monitoring and Corporate Debt Policy: Evidence From the Korean Market*. *Asia-Pacific Journal of Financial Studies*. 2021;50(2):210-37. doi: 10.1111/ajfs.12331.
10. Yuan R, Han Y, Chen Z. Multiple Large Shareholders and Financial Reporting Quality: Evidence From China. *Abacus*. 2022;59(1):197-229. doi: 10.1111/abac.12277.
11. Shin JE, Yoo S-W, Lee G. The Effects of Blockholder Dispersion on the Informativeness of Earnings: Evidence From Korea. *Sustainability*. 2020;12(22):9328. doi: 10.3390/su12229328.
12. Butt U, Chamberlain TW. Blockholdings, Dividend Policy, Stock Returns and Return Volatility: Evidence From the UAE. *International Journal of Financial Studies*. 2023;11(4):122. doi: 10.3390/ijfs11040122.

13. Valenzuela E, Chen Y. The Impact of Director Blockholders on Abnormal Accruals and Inventory. *Journal of Corporate Accounting & Finance*. 2023;34(4):193-207. doi: 10.1002/jcaf.22641.
14. Chada S, Varadharajan G. Earnings Quality, Institutional Investors and Corporate Cash Holdings: Evidence From India. *International Journal of Managerial Finance*. 2023;20(1):247-77. doi: 10.1108/ijmf-05-2022-0224.
15. Githaiga PN. Board Gender Diversity, Institutional Ownership and Earnings Management: Evidence From East African Community Listed Firms. *Journal of Accounting in Emerging Economies*. 2023;14(5):937-69. doi: 10.1108/jaee-10-2022-0312.
16. Chung CY, Choi W. Are Chinese or <scp>US</Scp> Institutional Investors Better at Monitoring Corporate Earnings Management? Evidence From Chinese Stocks in the <scp>US</Scp> Cross-Listing Market. *Asia-Pacific Journal of Financial Studies*. 2023;52(2):242-63. doi: 10.1111/ajfs.12418.
17. David P, Duru A, Lobo GJ, Maharjan J, Zhao Y. Threat of Exit by Non-Blockholders and Income Smoothing: Evidence From Foreign Institutional Investors in Japan*. *Contemporary Accounting Research*. 2022;39(2):1358-88. doi: 10.1111/1911-3846.12757.
18. Hieu PD, Anh HH. Ownership of Foreign Investors and Earnings Manipulation in Vietnamese Listed Firms. *International Journal of Asian Business and Information Management*. 2025;16(1):1-17. doi: 10.4018/ijabim.386164.
19. Duong KD, Phung NNY, Pham H, Le ANN. CEO Overpower and Real Earning Manipulation in Family Businesses: Do Ownership Structures Matter? *Sage Open*. 2024;14(3). doi: 10.1177/21582440241266922.
20. Kubick TR, Omer TC, Paskett T. The Influence of Common Institutional Ownership on Corporate Tax Planning. *Journal of Business Finance & Accounting*. 2026. doi: 10.1111/jbfa.70048.
21. Vo H, Trinh NT, Nguyễn TV. Does Common Ownership Affect the Value of Cash Holdings? *Accounting and Finance*. 2025;65(4):4111-37. doi: 10.1111/acfi.70070.
22. Li X, Lou Y, Wang R, Zhou K. How Do Institutional Investors Facilitate Reporting Comparability? Evidence From Common Institutional Ownership in the United States. *Contemporary Accounting Research*. 2025;42(2):1176-211. doi: 10.1111/1911-3846.13028.
23. Potharla S, Shette R. Insider Ownership and Real Earnings Management in Indian Companies. *Iim Kozhikode Society & Management Review*. 2022;14(1):75-87. doi: 10.1177/22779752221125262.
24. Adwan S, Alhaj-Ismael A, Jelic R. Non-Executive Employee Ownership and Financial Reporting Quality: Evidence From Europe. *Review of Quantitative Finance and Accounting*. 2022;59(2):793-823. doi: 10.1007/s11156-022-01058-8.
25. Ambarwati SDA, Haryono ST. Ownership Structure and Corporate Restructuring: Does It Have an Impact? *International Journal of Economics Business and Accounting Research (Ijebbar)*. 2022;5(4). doi: 10.29040/ijebbar.v5i4.3830.
26. Hanafi R, Rohman A, Ratmono D. Blockholders and Debtholders Pressure on Earnings Management in Indonesia. *Jurnal Reviu Akuntansi Dan Keuangan*. 2022;12(2):483-93. doi: 10.22219/jrak.v12i2.20413.
27. Trần MD, Hung DN. The Impact of Ownership Structure on Earnings Management: The Case of Vietnam. *Sage Open*. 2021;11(3). doi: 10.1177/21582440211047248.
28. Hassan S, Aksar M, Zahoor MY, Hussain S. An Empirical Investigation on Ownership Structure and Earnings Management: Evidence From PSX and FTSE-350 Listed Firms. *Journal of Organisational Studies and Innovation*. 2023;10(1):1-14. doi: 10.51659/josi.22.165.
29. Hassan Y, Abousamak A, Hijazi R. Does Corporate Governance Constrain Earnings Management in an Unstable Economic and Political Environment? *Asian Economic and Financial Review*. 2022;12(12):1074-93. doi: 10.55493/5002.v12i12.4670.
30. Gong R. Stock Liquidity and Tone of Press Releases. *Accounting and Finance*. 2023;64(2):1921-45. doi: 10.1111/acfi.13205.
31. DesJardine MR, Shi W, Cheng X. The New Invisible Hand: How Common Owners Use the Media as a Strategic Tool. *Administrative Science Quarterly*. 2023;68(4):956-1007. doi: 10.1177/00018392231192863.
32. Bowen RM, Dutta S, Tang S, Zhu P. Blockholder Mutual Fund Participation in Private In-house Meetings. *The Journal of Financial Research*. 2023;46(3):631-79. doi: 10.1111/jfir.12327.

33. Ellili NOD. Bibliometric Analysis on Corporate Governance Topics Published in the Journal Of Corporate Governance: The International Journal of Business in Society. Corporate Governance the International Journal of Business in Society. 2022;23(1):262-86. doi: 10.1108/cg-03-2022-0135.
34. Uduwalage E. Does Corporate Governance Enhance Financial Distress Prediction? South Asian Journal of Business Insights. 2021;1(1):78-114. doi: 10.4038/sajbi.v1i1.41.
35. Schoenfeld J. Contracts Between Firms and Shareholders. Journal of Accounting Research. 2020;58(2):383-427. doi: 10.1111/1475-679x.12297.
36. Wali MZI, Azzam MEA, Sabaa AFA. Does Real Earnings Management Changes According to Industry? Evidence From Egypt. 48-2235:(4)13;2022. المجلة العلمية للدراسات والبحوث المالية والإدارية. doi: 10.21608/masf.2022.240766.
37. Ismail TH, El-Deeb MS, El-Hafiezz RHA. Ownership Structure and Financial reporting Integrity: The moderating Role of Earnings Quality in Egyptian Practice. Journal of Humanities and Applied Social Sciences. 2024;6(5):471-95. doi: 10.1108/jhass-06-2024-0076.