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The Effect of the Corporate Governance System on the Earnings Management

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Abstract

Objectives: This study examines the impact of a firm's management system—measured through the board of directors' characteristics, audit committee attributes, and corporate ownership structure—on earnings management in business entities.

Methodology/Design/Approach: The research analyzes data from 167 firms listed on the Tehran Stock Exchange over 10 years (2013–2022) using linear regression modeling.

Findings: The results indicate that among board characteristics, board size has a negative effect on earnings management, while CEO tenure has a direct and significant impact. However, the effects of board independence and CEO duality were not supported. Regarding the audit committee, expertise was found to have a significant negative effect on earnings management, whereas no relationship was observed between audit committee size and independence. Lastly, within the ownership structure, only institutional ownership exhibited a direct and significant influence on earnings management, while the effects of ownership concentration and managerial ownership were not confirmed.

Innovation: This study reinforces the theoretical perspective that corporate governance mechanisms and management systems serve as critical tools for overseeing financial reporting processes. The findings contribute to the ongoing discourse on the role of governance structures in mitigating earnings management practices.

Keywords: Earnings management, Corporate governance, Board of directors, Ownership, Audit Committee.

1. Introduction

In accounting literature, earnings management is defined as the deliberate manipulation of a firm's financial performance by internal parties (particularly management) to mislead stakeholders and capital market participants. This practice can significantly impact a firm's future performance. Scholars view earnings management as a set of decisions aimed at maximizing reported earnings, often at the expense of faithfully representing a firm's short-term economic realities (Fraud et al., 2020).

Given the separation of ownership from management, the absence of a comprehensive theoretical framework despite established accounting standards, conflicts of interest, and the exclusive access of managers to certain financial information, there exists a potential for earnings manipulation and misleading financial reporting. In fact, within the boundaries of legal and accounting regulations, managers may manipulate earnings to enhance their firms' value, with accrual-based items being more susceptible to such manipulation than cash-based items (Al-Diri et al., 2020).

To mitigate this undesirable phenomenon and align the interests of various stakeholders, the concept of corporate governance has been introduced. Corporate governance encompasses a set of rules, processes, cultural norms, and relationships that must exist among shareholders, managers, and auditors to ensure the protection of shareholders' rights, prevent potential abuses, and achieve transparency, accountability, and fairness. Firms with robust corporate governance structures generally experience fewer conflicts of interest and their associated consequences.

According to Hu et al. (2015), firms with weaker financial performance exhibit a stronger motivation to engage in earnings management. Conversely, firms with strong financial performance are less likely to artificially inflate their earnings. Firms reporting lower operational cash flows due to poor financial performance are often perceived negatively by investors. In response, managers may manipulate earnings to boost stock prices, present a favorable corporate image, increase executive compensation, and ultimately reduce the political costs associated with underperformance (Choy, 2012). Thus, earnings management is sometimes employed as a tool to portray a favorable position. At the same time, financial performance measurement has become a critical concern for organizations, as it serves as the foundation for numerous internal and external decisions, including investment, capital expansion, and governance-related choices (Vakili Fard, 2015).

Recognizing the necessity of addressing earnings management and aligning the interests of diverse stakeholders, corporate governance has emerged as a fundamental mechanism to ensure managerial oversight, enforce regular audits, and protect the rights of investors and other stakeholders. Corporate governance determines how firms are managed, who governs them, and the processes for reporting and disseminating financial information to stakeholders. By clarifying these principles, this study aims to offer effective strategies for improving corporate resource management and enhancing firm value. Given that publicly traded firms are subject to scrutiny by real shareholders and are required to maintain high levels of transparency, firms listed on the stock exchange have been selected as the study population.

2 Literature review and development of hypothesis

2.1 Earnings Management

Earnings management, as a concept in accounting literature, is difficult to define clearly due to the ambiguous boundary between earnings management and financial fraud. However, a distinction is made between fraudulent activities and legitimate judgments and estimates that are within the framework of accepted accounting principles, which can be employed for legitimate earnings management (Zalaghi & Gadami Mashor, 2017).

Earnings management is generally viewed as a practice in which reported earnings reflect management's preferences rather than the firm's actual

financial performance (Iqbal & Strong, 2010). It is also defined as a targeted intervention in the financial reporting process to obtain personal benefits. These definitions emphasize the opportunistic aspect of earnings management, suggesting that managers, driven by profit-seeking motives, manipulate earnings, thereby reducing the informational content of accounting numbers.

Conversely, some scholars view earnings management more positively, defining it as the manipulation of profit numbers through which management's private information about future performance is communicated to investors. In this perspective, while earnings management might reduce the informational content of profit numbers, it could also help investors interpret reported figures more effectively. However, the opportunistic view of earnings management remains more widely accepted in the literature (Jiraporan et al., 2008).

Thus, earnings management occurs when managers use judgment in financial reporting and transactions, altering financial reports in a way that misleads stakeholders about the firm's economic performance or affects the outcomes of contracts reliant on financial figures. Unlike fraud, earnings management involves the selection of accounting procedures and estimates that comply with accepted accounting principles (Ebaid, 2012).

Early studies on earnings management highlight that incentives for such practices often stem from agency problems and information asymmetry (Davidson et al., 2005). Managers may exploit information asymmetry between domestic and foreign investors to obscure true financial performance, using earnings management to increase their rewards and secure their positions (Healy & Wallen, 1999). From an agency theory perspective, corporate governance is a key control mechanism, as it supervises management and holds decision-making power. Internal corporate governance mechanisms are thus expected to limit managerial actions intended to manipulate earnings (Feng & Huang, 2021).

2.2 Corporate Governance

The importance of protecting public interest, respecting shareholders' rights, promoting information transparency, and obligating firms to fulfill their social responsibilities has gained prominence over the past decade (Salehi Kardabadi & Yousefi, 2016). Achieving these ideals requires strong standards and effective implementation mechanisms, with corporate governance systems playing a central role. The primary goal of corporate governance is to ensure the long-term survival of firms, safeguard shareholders' interests against managers, and prevent the unjust transfer of wealth among groups (Ghodrati & Faizi, 2015).

Corporate governance encompasses decision-making structures, accountability, and behavior within organizations, aiming to strike a balance between management autonomy, accountability, and stakeholder interests (Mahdavi Parsa & Noor Ahmadi, 2018). It seeks to reduce agency problems, align the interests of owners and managers, and secure the interests of all stakeholders. Therefore, it is expected that the characteristics of a governance system will influence financial performance, as effective governance reduces the negative consequences of conflicts of interest, such as the abuse of power (Abdulwahid et al., 2021). Common corporate governance mechanisms include institutional ownership, ownership concentration, managerial ownership, audit committee size, audit committee independence, audit committee expertise, CEO tenure, board independence, board size, and CEO duality.

2.3 Characteristics of the Board

The board of directors is a critical element of corporate governance, tasked with monitoring management performance. Important characteristics of the board include its size, independence, CEO duality, and CEO tenure.

- **Board Size**: From an agency theory perspective, a larger board is more likely to be sensitive to agency problems, as it provides more oversight of management. Larger boards

tend to include more independent members with valuable expertise, which can reduce the likelihood of opportunistic behavior, including earnings management. Additionally, larger boards are more likely to delegate responsibilities to committees.

- **Independence of the Board**: Board independence is essential for effective management. Non-executive directors help balance the power within the board and prevent domination by any single group. This structure minimizes conflicts of interest between managers and stakeholders (Bannister & West, 2001).
- **CEO Tenure**: The CEO's tenure influences the board's supervisory role. A long tenure can strengthen the CEO's position and reduce the board's ability to supervise effectively. In such cases, the CEO may act less in the interests of shareholders, potentially increasing opportunistic behavior (Ebrahim, 2004). Some governance experts argue that a short CEO tenure may encourage opportunistic behavior for personal benefit (Brockman & Tystel, 2009).
- **CEO Duality**: CEO duality occurs when the CEO also serves as the chairman of the board, granting them more control and potentially limiting the board's ability to effectively monitor the firm.

Hypotheses Formulation: Based on the above discussion, the following hypotheses are proposed:

- **H1**: The independence of the board of directors has a significant effect on earnings management.
- **H2**: The size of the board of directors has a significant effect on earnings management.
- **H3**: The dual role of the CEO has a significant impact on earnings management.
- **H4**: The CEO's tenure has a significant effect on earnings management.

2.4 Characteristics of Ownership Structure

The ownership structure plays a crucial role in corporate governance and includes institutional ownership, managerial ownership, and ownership concentration.

- **Institutional Ownership**: Institutional investors, such as banks, insurance firms, and financial institutions, monitor firms by collecting information about management decisions and actively overseeing operations (Kanagartnam et al., 2004). Their involvement tends to reduce opportunistic behavior by management, leading to better firm performance and fewer earnings management.
- **Ownership Concentration**: High ownership concentration among large shareholders provides incentives for more effective monitoring of management. Concentrated ownership aligns shareholder interests with management, as large shareholders are more motivated to monitor firm activities (Aghaie Eskoei & Maleki, 2014).
- **Managerial Ownership**: Managerial ownership refers to the percentage of shares held by firm managers. Higher levels of managerial ownership can reduce conflicts of interest between managers and shareholders (Jensen et al., 1976).

Hypotheses Formulation: The following hypotheses are proposed based on the ownership structure:

- **H5**: Ownership concentration (major shareholders) has a significant effect on earnings management.
- **H6**: Institutional ownership (institutional shareholders) has a significant effect on earnings management.
- **H7**: Managerial ownership has a significant effect on earnings management.

2.5 Characteristics of the Audit Committee

The audit committee is an essential component of corporate governance. Key characteristics include the size, independence, and expertise of the committee.

- **Audit Committee Size**: While there is no ideal size for the audit committee, previous studies suggest that it should consist of three to five members, with a majority of independent directors (Abbott et al., 2004). Larger committees may face challenges in decision-making and coordination, potentially weakening their monitoring function (Soltana et al., 2014).
- **Independence of the Audit Committee**: The audit committee's effectiveness is tied to its independence. Independent members from outside the organization are better equipped to oversee financial reporting and ensure transparency (Lari Dasht Bayaz & Oradi, 2015).
- **Expertise of the Audit Committee**: Expertise is crucial for the audit committee, particularly in analyzing financial statements and understanding internal controls. A lack of financial expertise increases the likelihood of errors and fraud (Abbott et al., 2002).

Hypotheses Formulation: Based on the audit committee characteristics, the following hypotheses are formulated:

- **H8**: The size of the audit committee has a significant effect on earnings management.
- **H9**: The independence of the audit committee has a significant effect on earnings management.
- **H10**: The expertise of the audit committee has a significant effect on earnings management.

2.6. Background

A significant body of internal and external research has explored the relationship between various corporate governance indicators and earnings management. Several studies have found that institutional ownership and board independence are inversely related to earnings management. Aghaei and Chalaki (2008) confirmed this relationship, showing that these factors reduce earnings management. Baghbani and Pourghaffar Dastjerdi (2014), however, observed a direct relationship between CEO duality and earnings management, while no significant connection was found between the size or independence of the board and earnings management.

Shams et al. (2016) also contributed to this area of research, finding that a higher proportion of non-executive board members and the presence of expert auditors in the industry help reduce earnings management. Nakhai and Ahmadnejad (2020) expanded this understanding by revealing a significant relationship between board size, managerial ownership, institutional ownership, and family ownership with earnings management. Notably, they identified a reversed effect of internal managerial ownership, board size, institutional ownership, and family ownership on earnings management.

Further research by Ghaemi et al. (2019) confirmed a negative and significant relationship between audit committee expertise and earnings management. Similarly, Tajvidi and Ghaempanah (2021) concluded that the participation of financial experts in the audit committee, along with greater independence and size of the audit committee, significantly reduces earnings management.

In more recent studies, Mohaghegh and Formahini Farahani (2023) identified a negative and significant relationship between board dynamics and earnings management, particularly concerning the management of actual and accrued profits. Jeiran Asia and Ghayour (2023) found that institutional and managerial ownership has a negative effect on earnings management, while corporate ownership exhibits a positive and significant impact.

Kirana et al. (2020) presented evidence that board size positively influences earnings management, while Surjandari et al. (2021) noted that specific corporate

governance characteristics, such as board independence, institutional ownership, and the frequency of board meetings, positively affect earnings management. Varnamkhasti (2022) similarly confirmed that board independence, CEO duality, and the number of board meetings correlate positively with earnings management.

Sirait et al. (2022) found that robust corporate governance mechanisms, such as managerial ownership, institutional ownership, and the financial expertise of the audit committee, all play significant roles in earnings management. Chatterjee and Rakshit (2023) documented a strong negative relationship between earnings management and the percentage of independent directors on the board, highlighting the importance of board member accuracy.

Nguyen et al. (2024) added nuance to this discussion by illustrating that quality corporate governance has a stronger negative impact on earnings management in private firms, firms with high foreign ownership, low concentrated ownership, and high-growth firms. Finally, the study by Bashir et al. (2024) reinforced the role of institutional investors in limiting earnings management, also highlighting the influence of board size and ownership concentration.

These studies indicate that various corporate governance characteristics, including board structure, ownership types, and audit committee attributes, significantly influence earnings management, with mixed results in terms of the direction and strength of these relationships across different contexts.

3. Data and Methodology

This research is classified as practical research based on its purpose, and its findings are intended to benefit a broad range of stakeholders, including firm managers, shareholders, investors, lenders, researchers, and standards developers. The research is also a descriptive and correlational type of causal (post-event) study.

3.1 Data and Sample Collection

The statistical population of this research comprises all firms listed on the Tehran Stock Exchange. Given the large size of the population and the potential inconsistencies among its members, specific criteria were applied to select a more focused sample for analysis. The period of analysis spans from 2013 to 2022, and due to the limited number of manufacturing firms on the Tehran Stock Exchange that meet the applied criteria, the available population was selected in its entirety to maximize the number of observations for statistical analysis.

The following conditions were used to define the sample:

- To increase comparability, the financial year of the firms should end at the end of March.
- Firms that changed their financial year during the study period were excluded.
- Only firms that were listed on the stock market before 2013 were considered.
- Banks, financial intermediaries, leasing firms, holding firms, and investment firms were excluded due to the specific nature and activities of these organizations.
- The financial information of the firms must be available to extract the required data.

Based on these criteria, 167 firms were selected, and their financial data was gathered from the Codal website.

Additionally, this research is library-based in terms of data collection methods. Theoretical foundations were gathered from Persian books, journals, articles, and specialized theses in the fields of finance and accounting. Data was also obtained from archives, audit records, reports, financial statements, and related notes from firms, which were sourced from the Tehran Stock Exchange (Codal website). The research employed multivariate regression analysis as the statistical method, and relationships between the variables were examined using Eviews version 10 software.

3.2 Methodology

3.2.1 Research design (Empirical model)

The desired regression model to test the hypotheses in this research is based on the study of Nguyen et al. (2024). The model is specified as follows:

$$\begin{aligned} AbcDAC_{i,t} = \alpha &+ \beta_1 B\_IND_{i,t} + \beta_2 B\_SIZE_{i,t} \\ &+ \beta_3 CEO\_DUALITY_{i,t} \\ &+ \beta_4 TENURE_{i,t} \\ &+ 6\beta_5 OWN\_CON_{i,t} \\ &+ \beta_7 INS\_OWN_{i,t} \\ &+ \beta_7 MAN\_OWN_{i,t} \\ &+ \beta_8 AC\_SIZE_{i,t} + \beta_9 AC\_IND_{i,t} \\ &+ \beta_{10} AC\_EXP_{i,t} \\ &+ \sum_{j=1}^{10} \beta_j Control\ Variables_{i,t} \\ &+ \varepsilon_{i,t} \end{aligned}$$

3.2.2 Measurement of variables

dependent variable: Earnings management (AbsDAC)- In this research, earnings management is used through the adjusted model of Jones (1991) presented by Dechow et al. (1995) and in other studies such as Teo et al. (1998) and Xie et al. (2003) to determine Earnings management (discretionary accruals) used are measured. The modified Jones model presented by Dechow et al. (1995) is very powerful among the various models presented for measuring earnings management (Lobo and Zhou, 2001).

To measure earnings management, first, the total accruals for each of the sample firms in each year are calculated as follows:

$$TotalAccruals_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STD_{it}) - Dep_{it}$$

In the above equation, ΔCA represents the change in current assets; $\Delta Cash$ represents the change in cash and cash equivalent; ΔCL represents the change in total current liabilities; ΔSTD represents the change in the current share of long-term debts; Dep represents depreciation costs of tangible and intangible assets.

The adjusted model of Jones (1991) based on cross-sectional data (or time series data) is used to estimate non-discretionary accruals and total accruals. The following model is suitable for total accruals.

$$\frac{TAc_{it}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{\Delta REV_{it}}{A_{i,t-1}} + \beta_2 \frac{PPE_{it}}{A_{i,t-1}} + \varepsilon_{it}$$

For each year and industry, total accruals (TAC) are adjusted based on changes in sales revenues (ΔREV) and gross property, plant, and equipment (PPE). To solve the problem of heterogeneity of variance, all variables are scaled by total assets at the beginning of the year (A). Using regression parameter estimates ($\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2$), each sample firm's nondiscretionary accruals (NDCA) are estimated by adjusting the change in revenues by the change in accounts receivable (ΔAR).

It is possible that the firms could have manipulated the sales by changing the credit conditions (Dechow et al., 1995). The regression parameters obtained from model 2 are used in model 3 to obtain optional accrual items.

$$NDAC_{it} = \hat{\beta}_0 + \hat{\beta}_1 \frac{\Delta REV_{it} - \Delta AR_{it}}{A_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{it}}{A_{i,t-1}}$$

By estimating non-discretionary accruals from equation 2, the amount of discretionary accruals for firm i in industry j in year t is calculated as the remainder of equation 4:

$$DAC_{it} = \frac{TAC_{i,t}}{A_{i,t-1}} - NDAC_{i,t}$$

According to past research, the absolute value of discretionary accruals (Abs(DAC)) has been used as a measure for earnings management. All the variables of the profit management model are divided by the total assets at the beginning of the period in order to solve the heteroscedasticity.

Independent Variables

Corporate Governance:

Corporate governance refers to a set of mechanisms that protect investors from opportunistic behavior (Shleifer & Vishny, 1997; Gillan, 2006). These mechanisms can be either internal or external. The corporate governance mechanisms used in this research are defined as follows:

Indicators of Board Characteristics:

- **Board Independence (B_IND):** The proportion of non-executive (independent) board members, calculated as the number of independent members divided by the total number of board members.
- **Board Size (B_SIZE):** The total number of board members.
- **CEO Duality (CEO_DUALITY):** A binary variable, equal to 1 if the CEO is also the chairman or vice-chairman of the board and 0 otherwise.
- **CEO Tenure (TENURE):** The natural logarithm of the CEO's tenure on the board of directors.

Indicators of Ownership Characteristics:

- **Ownership Concentration (OWN_CON):** The percentage of firm shares held by shareholders who own at least 5% of the firm's shares.
- **Institutional Ownership (INS_OWN):** The percentage of firm shares owned by banks, insurance firms, financial institutions, holding firms, organizations, institutions, and government entities.
- **Management Ownership (MAN_OWN):** The percentage of firm shares owned by the firm's managers.

Indicators of Audit Committee Characteristics:

- **Audit Committee Size (AC_SIZE):** The total number of members in the firm's audit committee.
- **Audit Committee Independence (AC_IND):** The ratio of independent members to the total number of members in the audit committee.
- **Audit Committee Expertise (AC_EXP):** The ratio of members with accounting or auditing qualifications to the total number of members in the audit committee.

Control Variables

The specific characteristics of the firm that could affect earnings management are considered control variables, including firm size, profitability, capital structure, liquidity, and firm age. These control variables include:

- **Firm Size (F_SIZE):** The natural logarithm of the firm's total assets.
- **Return on Assets (ROA):** The net profit divided by the average total assets of the firm.
- **Financial Leverage (F_LEV):** The total liabilities divided by the firm's total assets.
- **Firm Age (AGE):** The natural logarithm of the number of years since the firm's establishment up to the study period.
- **Market to Book Value (MTB):** The market value of the firm's stock divided by its book value.
- **Cumulative Cash Flow (CFO):** The cash flow from operating activities divided by the total assets at the beginning of the firm's period.
- **Loss (LOSS):** A binary variable, equal to 1 if the firm has incurred a loss and 0 otherwise.
- **Sales Growth (SALE_GROWTH):** The percentage growth in the firm's sales for the current year.

Auditor Type (BIG): A binary variable, equal to 1 if the firm's audit is conducted by a major auditing organization and 0 otherwise. Additionally, fixed effects for year and industry are included as control variables.

4. Empirical results

4.1 Description statistics

To examine the general characteristics of the variables and conduct a detailed analysis, it is essential to review the descriptive statistics of the variables. Table 1 presents the descriptive statistics for the data of the variables used in this research. These descriptive statistics are based on 167 sample firms over a period of 10 years (2013 to 2022).

The mean value for earnings management is 0.003, suggesting that most of the data are concentrated on this point. The minimum and maximum values for earnings management are -1.005 and 0.98, respectively. The mean board independence is 0.66, indicating that approximately 66% of the board members in the sample firms during the study period are non-executive members. The mean board size is 5.02, reflecting that most boards consist of 5 members. The mean value of 0.99 for CEO duality indicates that nearly 99% of the CEOs also serve as the chairman or vice-chairman of the board of directors. The mean CEO tenure is 3.76, suggesting that CEOs typically change every 4 years.

Regarding the ownership structure, the results show that approximately 55% of the shares are held by major shareholders, 55% by institutional shareholders, and 59% by managers. Concerning the audit committee, the results indicate that the average number of audit committee members in the sample is approximately 3. Additionally, about 66% of the members possess financial expertise, and 66% are independent members.

Table 1: Descriptive statistics of the variables

Variable	Mean	Median	Maximum	Minimum	S.D
AbsDAC	0.003	-0.01	0.98	-1.005	0.17
BIND	0.66	0.60	1.00	0.00	0.19
BSIZE	5.02	0.50	7.00	5.00	0.21
DUALITY	0.99	1.00	1.00	0.00	0.09
TENURE	3.76	2.00	21.00	1.00	3.66
OWNCON	0.55	1.00	1.00	0.00	0.50
MANOWN	58.88	66.00	99.05	0.00	26.45
INSOWN	54.67	64.00	99.92	0.00	31.78
ACEXP	0.66	0.67	1.00	0.00	0.32
ACSIZE	2.88	3.00	6.00	0.00	0.98
ACIND	0.66	0.67	1.00	0.00	0.28
FSIZE	14.92	14.64	21.57	1.053	1.72
ROA	0.13	0.11	0.68	-1.06	0.17
FLEV	0.58	0.57	4.003	0.03	0.30
MTB	5.04	3.27	227.68	-862.99	24.19
LOSS	0.11	0.00	1.00	0.00	0.32
AGE	2.97	2.996	4.01	1.79	0.39
BIG	0.17	0.00	1.00	0.00	0.37
SALE_GROWTH	0.44	0.32	43.49	-0.97	1.29
CFO	0.11	0.09	0.69	-1.31	0.14

4.2 Inferential statistics

Limber (Chow) and Hausman F test

Limer's F test indicates that, at the 5% significance level, the panel regression method should be used if the p-value is less than 0.05, as opposed to the pooling regression method. Additionally, the appropriate model between fixed effects and random effects should be selected using the Hausman test. If the significance level is below 5%, the fixed effects model is preferred, while if the significance level is above 5%, the random effects model is deemed more appropriate. The results of Limer's and Hausman's F tests are presented in Table 2.

The results of Limer's (Chow) F test presented in Table 2 indicate that the hypothesis of having the same intercept for all the studied firms is rejected at the 5% significance level. Therefore, the panel data method can be used to estimate the model. Additionally, the results show that the null hypothesis of selecting the random effects method for model estimation is rejected at the 5% significance level. Consequently, the fixed effects method is appropriate for estimating the models.

Table 2: The results of Leimer (Chow) and Hausman's F test

Fixed Effects Tests	Statistic	Prob/	Hausman Test	Chi-Sq/ Statistic	Prob
Adoption of tabular data pattern	3.49	0.00	Adopting fixed width effects from the origin	99.48	0.00

Correlation Coefficients

One potential issue in regression analysis is the presence of strong collinearity between independent variables in the model. Most researchers believe that there is no definitive solution to the collinearity problem, and the best approach to ensure the absence of strong collinearity between explanatory variables is to check the Pearson correlation coefficients. To address this, the Pearson correlation coefficient test has been conducted for all explanatory variables in the regression model.

Additionally, another test for detecting multicollinearity is the Variance Inflation Factor (VIF) test, which helps assess the degree of multicollinearity. In this test, a VIF value greater than 5 indicates a potential multicollinearity problem between the variables.

The results of the correlation coefficients are presented in Table 3, along with the results of the VIF test and hypothesis testing.

As shown, the correlation coefficients between both variables in the research are smaller than 0/7, which confirms the absence of multicollinearity.

Table 3: Pearson correlation matrix

Variable	bind	Bsize	duality	tenure	owncon	insown	manown	acsize	acind	acexp	fsize
bind	1.00										
Bsize	0.13	1.00									
duality	-0.04	0.01	1.00								
tenure	0.04	-0.02	-0.05	1.00							
owncon	0.06	-0.07	-0.06	0.05	1.00						
insown	-0.05	-0.10	-0.06	-0.05	0.47	1.00					
manown	0.01	-0.08	-0.04	-0.02	0.57	0.67	1.00				
acsize	-0.04	0.02	-0.05	-0.06	0.05	0.13	0.004	1.00			

Variable	bind	Bsize	duality	tenure	owncon	insown	manown	acsize	acind	acexp	fsize
acind	-0.07	0.06	-0.03	-0.06	0.01	0.02	-0.04	0.38	1.00		
acexp	-0.01	0.02	0.03	-0.07	0.13	0.04	0.06	0.30	0.22	1.00	
fsize	-0.12	0.03	-0.11	-0.05	0.09	0.15	0.03	0.32	0.18	0.08	1.00
roa	0.12	0.03	0.01	0.09	0.11	0.05	0.04	0.16	0.08	0.10	0.22
flev	-0.22	-0.07	-0.06	-0.13	0.11	0.20	0.17	-0.08	-0.01	-0.03	-0.01
Mtb	0.001	-0.06	-0.01	-0.06	0.01	0.02	0.02	0.10	0.07	0.07	0.04
loss	-0.14	-0.02	0.01	-0.13	-0.13	-0.06	-0.07	-0.04	-0.01	-0.03	-0.09
age	-0.15	-0.04	0.09	-0.04	-0.15	-0.21	-0.15	0.03	-0.01	0.01	0.21
big	-0.20	-0.03	0.03	-0.11	0.04	0.14	0.11	0.004	0.07	-0.02	0.33
sale_growth	-0.07	-0.03	-0.02	0.02	-0.31	-0.08	0.11	0.10	0.08	0.04	0.26
cfo	0.08	0.02	0.05	0.06	0.15	0.15	0.11	0.10	0.04	0.08	0.07

Continued Table 3: Pearson correlation matrix

Variable	roa	flev	mtb	loss	age	big	sale_growth	cfo
Roa	1.00							
flev	0.59	1.00						
mtb	0.36	0.02	1.00					
loss	0.55	0.34	0.17	1.00				
age	0.05	-0.01	0.17	0.02	1.00			
big	0.08	0.20	-0.09	0.09	0.04	1.00		
sale_growth	0.35	-0.16	0.33	-0.20	0.17	-0.04	1.00	
cfo	0.44	-0.20	0.09	-0.20	-0.07	-0.04	0.06	1.00

4.3 Multiple liner regression results

The results of the estimation of the research model to check the hypotheses are described in the following table:

The results in Table 4 indicate that, based on the F statistic and its significance level (which is less than the critical value of 0.05), the regression model is statistically significant and acceptable. Furthermore, the R-squared value of 0.80 in the model suggests that the independent and control variables explain approximately 80% of the variation in the dependent variable (earnings management). Additionally, the Durbin-Watson statistic falls within the range of 1.5 to 2.5, indicating that there is no autocorrelation in the model. The collinearity test results show that all independent and control variables have a Variance Inflation Factor (VIF) less than 5, implying that there is no multicollinearity problem in the model.

Regarding the relationship between board characteristics and earnings management, the results indicate that the board size and CEO tenure significantly affect earnings management, as the significance level of their t-statistics is less than 0.05. Specifically, board size has a negative effect (-0.03) and CEO tenure has a positive effect. This implies that larger board sizes and shorter CEO tenures are associated with lower levels of earnings management. However, the significance levels for board independence and CEO duality are greater than 0.05, meaning that these variables do not significantly influence earnings management. Therefore, the second and fourth hypotheses are confirmed, while the first and third hypotheses are rejected.

In terms of the impact of ownership characteristics and ownership structure on earnings management, the results show that among the ownership structure indicators, only institutional ownership has a

significant effect on earnings management, with a significance level of less than 0.05. The impact coefficient for institutional ownership (0.001) is positive and direct, indicating that higher institutional ownership is associated with greater earnings management. However, the significance levels for ownership concentration and managerial ownership are greater than 0.05, suggesting that these variables do not have a significant effect on earnings management. Consequently, the sixth hypothesis is confirmed, while the fifth and seventh hypotheses are rejected.

Finally, the results related to the influence of audit committee characteristics on earnings management indicate that only the audit committee's expertise has a significant effect, with a probability level lower than 0.05. The coefficient for audit committee expertise (-0.01) is negative and inverse, indicating that greater expertise within the audit committee is associated with lower levels of earnings management. However, the significance levels for the size and independence of the audit committee are greater than 0.05, meaning these factors do not significantly impact earnings management. Therefore, the tenth hypothesis is confirmed, while the eighth and ninth hypotheses are rejected.

Moreover, the results reveal that among the control variables, firm size, return on assets, loss, auditor type, and operating cash flow have significant effects on earnings management, while financial leverage, market-to-book ratio, age, and sales growth do not.

Table 4: The results of the research hypothesis test

dependent variable	independent variable	Coefficient	Std/ Error	t-Statistic	Prob	test result	VIF
AbsDAC	BIND	0.007	0.01	0.49	0.63	Rejection	2.44
	BSIZE	-0.03	0.01	-2.46	0.01	Acceptance	3.17
	DUALITY	-0.02	0.02	-0.67	0.50	Rejection	2.39
	TENURE	0.002	0.001	3.43	0.001	Acceptance	2.45
	OWNCON	-0.006	0.006	-1.08	0.28	Rejection	3.60
	INSOWN	0.001	0.0002	2.54	0.01	Acceptance	3.46
	MANOWN	0.002	0.001	1.62	0.10	Rejection	1.44
	ACSIZE	0.003	0.003	1.00	0.32	Rejection	3.37
	ACIND	0.005	0.1	0.53	0.60	Rejection	3.05
	ACEXP	-0.01	0.007	-2.16	0.03	Acceptance	2.76
	FSIZE	0.007	0.003	-2.12	0.03	Acceptance	2.86
	ROA	1.04	0.02	42.09	0.00	Acceptance	4.14
	FLEV	0.03	0.02	1.90	0.058	Rejection	4.32
	MTB	0.00002	0.00005	0.44	0.66	Rejection	1.14
	LOSS	0.02	0.006	3.37	0.001	Acceptance	2.02
	AGE	-0.02	0.01	-1.71	0.09	Rejection	3.29
	BIG	0.04	0.01	3.99	0.0001	Acceptance	1.26
	SALE_GROWTH	-0.001	0.0006	-1.51	0.13	Rejection	1.18
	CFO	1.23	0.02	56.82	0.00	Acceptance	1.91
	Width from the origin	0.027	0.08	3.19	0.001	Acceptance	
F-statistic (Prob) = 33.04 (0.00) Durbin Watson Statistics = 1.71				R-squared = 0.80 Adjusted R-squared = 0.78			

5. Conclusion, implication, suggestion, and limitation

This study aims to investigate the effect of the corporate governance system on earnings management for firms listed on the Tehran Stock Exchange in the years 2013 to 2022 using a multivariable linear regression method. The management system of the firm was considered through the characteristics of the board of directors, ownership structure, and the characteristics of the audit committee, while earnings management was measured through discretionary accrual items of the modified Jones model (1991).

In general, the findings indicate the impact of corporate governance system indicators on earnings management. In the dimension of board characteristics, the results show the negative and inverse effects of board size and the positive and direct effect of CEO tenure on earnings management. In other words, the results confirmed the second and fourth hypotheses and rejected the first and third hypotheses. Regarding the negative and inverse effect of board size, it can be stated that the more the number of board members, the more their power will increase, and due to their larger number, there will be more supervision over the managers.

Also, the tenure of the CEO may increase the management power and influence of the CEO, and controlling the board of directors reduces their supervisory ability, which in turn causes the managers to act in their own interests. In other words, the long tenure of the CEO will strengthen his position and increase his power, and the motivation for opportunistic behavior will also increase. These results are in line with the studies of Ebrahim (2004) and Brookman and Thistle (2009).

Also, in the structural dimension of ownership, the findings of this research confirmed the sixth hypothesis and rejected the fifth and seventh hypotheses. In other words, contrary to expectations, the results confirm that institutional ownership has a positive and direct effect on earnings management. In this regard, it can be stated that job security concerns as a result of institutional shareholder pressures on managers cause management to focus on short-term results, which in turn causes earnings manipulation to better show the firm's status and performance. These results are in contrast with the studies of Vaez et al. (2013), Kanagaretnam et al. (2004), and Bannister and Wiest (2001).

Finally, about the characteristics of the audit committee and earnings management, the results show that the 10th hypothesis regarding the effect of the expertise of the audit committee on earnings management is confirmed and the 8th and 9th hypotheses regarding the effect of the size of the audit committee and the independence of the audit committee are also rejected. In other words, the results show that the expertise of the audit committee has led to more monitoring of the behavior of managers and financial reporting of the firm, which can increase the quality of financial reporting and prevent the opportunistic behavior of managers. These results are in line with the studies of Abbott et al. (2002) and Tajvidi and Ghaempanah (2021).

According to the obtained results, suggestions are also presented in the field of corporate governance and earnings management. It is suggested that the compilers and legislators provide the conditions that firms are required to disclose more information about the management and governance system of the firm. Also, investors and analysts are suggested to pay more attention to the management system of the firms, especially the number of members, the tenure of the CEO, the number of shares of the firm's institutional shareholders, and the expertise of the audit committee, and in this way, get more quality information from the firms. In addition, it is suggested that the lenders should pay attention to the fact that the earnings declared by the firms with expert auditors, fewer institutional shareholders, more board members, and tenured CEOs at the time of the decision to grant credit to firms are lower, have better quality, and will have more confidence in collecting claims. Therefore, the risk of granting credit to them will also be lower.

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