

The Moderating Effect of Audit Quality on the Relationship between Corporate Governance and Investment Efficiency

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ABSTRACT

The present study investigates the moderating role of audit quality in the relationship between corporate governance and investment efficiency in companies listed on the Tehran Stock Exchange. The study is conducted on the basis of a descriptive-correlational design and panel data methods, analysing a sample of TSE-listed enterprises throughout a recent multi-year period. Investment efficiency is quantified using the Richardson (2006) model, corporate governance using a composite index of board independence, board size, ownership concentration, and institutional ownership, and audit quality using audit firm size and auditor industry specialisation. The hypotheses are tested using moderated multiple regression analysis with fixed effects estimation. The results show that corporate governance and audit quality improve investment efficiency separately. Importantly, the interaction term of corporate governance and audit quality is negative and significant, suggesting that audit quality improves the positive effect of corporate governance on investment efficiency. The moderating effect is resistant to alternative measurements, subsamples and estimate methods and is stronger for smaller enterprises. These are the first empirical results to extend agency theory by proving that internal and external monitoring mechanisms are complements rather than replacements. Practical implications include the need to improve the efficiency of capital allocation in emerging markets.

Keywords: Audit Quality, Corporate Governance, Investment Efficiency, Tehran Stock Exchange, Moderating Effect.

Introduction

Investment constitutes one of the most consequential corporate decisions because the allocation of financial resources to productive assets, development projects, acquisitions, technology, and other strategic opportunities directly shapes firm growth, competitiveness, profitability, and long-term value creation. From an economic perspective, investment is efficient when firms undertake projects whose expected benefits justify their costs while avoiding projects that destroy value. In practice, however, corporate investment decisions are rarely made under conditions of perfect information or complete alignment of interests. Managers frequently possess information that shareholders and external capital providers cannot readily observe, while their preferences, incentives, and risk attitudes may diverge from those of investors. Consequently, firms may deviate from optimal investment levels through either overinvestment in projects with insufficient economic returns or underinvestment in profitable



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opportunities that would otherwise increase firm value. Richardson's influential framework conceptualizes abnormal investment as the deviation of realized investment from the level predicted by firms' economic fundamentals and has become an important empirical basis for identifying inefficient capital allocation (1). Investment efficiency therefore represents not merely the volume of corporate investment but the degree to which investment expenditure corresponds to economically justified opportunities and avoids distortions caused by agency problems, financing constraints, managerial incentives, and informational frictions.

The problem of inefficient investment becomes particularly important when firms generate substantial internally available funds or when their managers possess significant discretion over resource allocation. Free cash flow can encourage managers to expand the scale of the firm, pursue prestige-enhancing projects, or retain control over resources even when additional investments do not maximize shareholder value, creating conditions conducive to overinvestment (1). Conversely, information asymmetry between firms and external financiers can increase the cost of external capital and induce managers to reject otherwise profitable projects, leading to underinvestment. Financial reporting quality is therefore closely connected to investment efficiency because credible accounting information reduces uncertainty surrounding firms' economic prospects and can facilitate more accurate evaluation of investment opportunities. Evidence indicates that higher-quality financial reporting and appropriate debt-maturity structures can constrain inefficient investment, particularly by reducing informational disadvantages and disciplining corporate decision making (2). These considerations place governance, transparency, reporting credibility, and external assurance at the center of the investment-efficiency debate rather than treating investment choices solely as the outcome of production opportunities and financing capacity.

Corporate governance provides one of the principal institutional mechanisms through which agency conflicts and information asymmetries affecting investment decisions can be controlled. Governance arrangements define the allocation of authority, monitoring responsibility, accountability, and decision rights among shareholders, boards of directors, executives, institutional investors, and other stakeholders. Effective boards can scrutinize managerial proposals, independent directors can challenge opportunistic decisions, institutional shareholders can exercise informed oversight, and ownership arrangements can either strengthen or weaken managerial discipline. Research synthesizing the antecedents of investment efficiency identifies board characteristics, ownership structure, financial reporting and auditing quality, institutional ownership, and broader governance arrangements as recurrent determinants of corporate investment outcomes (3). International evidence similarly demonstrates that governance mechanisms affect investment efficiency by reducing information asymmetry, restricting managerial opportunism, and improving the alignment of corporate investment with economically viable opportunities (4). Thus, governance quality is expected to influence not only whether managers are formally accountable but also whether scarce corporate resources are directed toward investments capable of generating sustainable economic value.

The effectiveness of governance mechanisms, however, is neither uniform nor independent of institutional conditions. Emerging capital markets provide particularly important settings because investor protection, market transparency, ownership structures, enforcement mechanisms, and information environments frequently differ from those observed in more mature economies. Cross-market evidence indicates that stronger corporate governance and transparency can mitigate information asymmetry in emerging capital markets, thereby improving the quality of information available to investors and strengthening the informational basis of corporate decision making (5). Asian evidence likewise suggests that governance quality is systematically associated with greater investment efficiency, although the magnitude and operation of specific mechanisms depend on ownership, board arrangements, and

institutional characteristics (4). The financing structure of firms may further interact with governance arrangements; evidence from listed Indian firms shows that debt maturity and corporate governance jointly influence investment inefficiency, highlighting how internal monitoring and external financial discipline can operate simultaneously in determining capital-allocation outcomes (6). Such findings support a contingent view in which the consequences of governance depend on complementary monitoring mechanisms and the institutional environment in which firms operate.

Iran represents a particularly relevant emerging-market context for examining these issues because firms listed on the Tehran Stock Exchange operate within an environment characterized by concentrated ownership, substantial institutional and governmental participation, evolving corporate governance arrangements, macroeconomic volatility, and distinctive capital-market structures. Ownership structure is especially important because concentrated ownership may strengthen monitoring of managers while simultaneously creating the possibility that controlling shareholders pursue objectives that are not fully aligned with minority investors. Evidence from the Tehran Stock Exchange demonstrates that ownership arrangements have meaningful consequences for corporate financial outcomes and that the effects of ownership must be understood dynamically rather than as a simple static governance characteristic (7). More recent evidence further shows that ownership concentration interacts with board diversity and environmental governance in shaping investment efficiency and bankruptcy risk, demonstrating that the implications of ownership concentration depend on other elements of the governance architecture (8). These findings reinforce the need to analyze corporate governance as a multidimensional monitoring system rather than assuming that any single governance characteristic independently determines investment behavior.

Empirical evidence from Iran has generally supported an association between stronger governance and more efficient investment decisions. Earlier research on Tehran Stock Exchange firms found that stronger corporate governance arrangements were associated with greater investment efficiency, supporting the proposition that improved monitoring and accountability can limit distortions in corporate capital allocation (9). More recent research has expanded this perspective by considering the conditions under which governance becomes more effective. Social capital, for example, can strengthen the relationship between corporate governance and investment efficiency by facilitating information exchange, trust, coordination, and relational resources that complement formal governance mechanisms (10). Research focusing specifically on board social capital has similarly indicated that board-level relational resources can augment investment decisions among Tehran Stock Exchange companies, emphasizing that formal board structures are only one dimension of effective governance (11). In addition, evidence from Iran's competitive Islamic market setting indicates that governance can moderate the adverse consequences that competitive pressure may exert on investment efficiency and that individual governance dimensions do not necessarily contribute equally to improved capital allocation (12). Collectively, this literature implies that governance effectiveness is conditional upon complementary institutional, relational, and monitoring factors.

Among these complementary mechanisms, external auditing occupies a particularly important position. Auditing enhances the credibility of financial statements by subjecting management-generated financial information to independent professional examination. High audit quality increases the probability that material misstatements, aggressive reporting practices, and other deficiencies in financial information will be detected and appropriately addressed, thereby increasing users' confidence in reported information. Audit quality is nevertheless a multidimensional construct influenced by auditor competence, independence, audit inputs, engagement processes, institutional settings, and observable and unobservable engagement characteristics. Francis's framework

emphasizes that audit quality should be understood across multiple levels of the audit process and that differences in audit inputs and execution can produce economically meaningful variation in financial reporting outcomes (13). For investment decisions, this variation is particularly important because managers, boards, creditors, shareholders, and other capital-market participants rely on financial information when evaluating profitability, liquidity, risk, financing capacity, and investment opportunities.

High-quality auditing may improve investment efficiency through several interconnected channels. First, credible external assurance reduces information asymmetry by increasing confidence that reported performance and financial position accurately reflect underlying economic conditions. Second, effective audits constrain managerial ability to manipulate reported earnings or conceal poorly performing projects, thereby limiting the information environment in which opportunistic investment decisions can persist. Third, improved audit credibility can reduce financing frictions by increasing the confidence of lenders and investors, potentially allowing firms with profitable investment opportunities to obtain capital under more favorable conditions. Empirical evidence from Pakistan indicates that both financial reporting quality and audit quality contribute to investment efficiency, demonstrating that external assurance provides incremental informational benefits beyond the quality of accounting reports alone (14). More recent theoretical and empirical work also links audit quality directly to investment efficiency and emphasizes the interaction between external auditing and the broader information environment surrounding corporate investment decisions (15). Accordingly, audit quality can be viewed not merely as an ex post compliance mechanism but as an economically relevant component of the information and monitoring infrastructure supporting investment allocation.

Evidence from other institutional settings reinforces the broader economic significance of audit quality. Research on Greek companies has shown that audit quality is associated with firm performance and risk, suggesting that the consequences of high-quality assurance extend beyond accounting reliability to economically important corporate outcomes (16). In emerging markets, audit quality and board independence have also been associated with investment decisions, indicating that external auditing and internal board monitoring may operate jointly rather than independently (17). This interaction is theoretically important. If internal governance constrains managerial discretion while external auditing increases the reliability of the information through which that discretion is evaluated, the simultaneous presence of strong governance and high audit quality may generate greater investment benefits than either mechanism in isolation. In contrast, strong governance structures supported by low-quality financial verification may operate with incomplete or unreliable information, while high-quality audits in firms with weak boards or ineffective ownership monitoring may identify reporting problems without necessarily ensuring disciplined investment decisions. The potential complementarity between these mechanisms therefore provides a compelling basis for examining audit quality as a moderator rather than limiting analysis to its direct effect on investment efficiency.

The Iranian audit market makes this question particularly salient. Unlike markets dominated by large international audit networks, the Iranian environment has a distinctive audit-market structure in which audit-firm characteristics, competition, specialization, and market organization may influence both audit quality and audit pricing (18). Such institutional characteristics imply that audit quality cannot automatically be inferred from evidence generated in developed markets. Moreover, Iran's dual-signature auditing environment provides an unusual opportunity to consider the role of individual audit partners and engagement-level quality. Recent evidence indicates that audit-partner quality is economically consequential in Iran and is associated with stock price crash risk, demonstrating

that variation in audit quality exists not only across audit firms but also at the partner level (19). This evidence is especially relevant for investment research because stock price crash risk and investment inefficiency share an informational foundation: both can be aggravated when managers retain private information, conceal adverse outcomes, or operate in weak monitoring environments. Greater attention to audit quality may therefore provide a more complete explanation of how governance influences real corporate decisions in the Iranian market.

Changes in corporate reporting practices further strengthen the case for considering audit quality within the broader governance and information environment. Integrated reporting, for instance, expands conventional financial disclosure by combining financial and nonfinancial dimensions of corporate performance and can affect both the information available to auditors and the complexity of the assurance process. Evidence from Tehran Stock Exchange firms indicates that integrated reporting is associated with audit quality and audit fees, suggesting that developments in reporting architecture can modify the conditions under which external assurance is produced (20). This finding is consequential for investment efficiency because governance decisions depend increasingly on a broader set of financial and nonfinancial information. If reporting quality affects auditing, and auditing affects the credibility of information available to decision makers, audit quality may represent an important transmission mechanism through which improvements in transparency reinforce the effectiveness of governance. The governance–audit relationship should consequently be viewed as part of an integrated monitoring architecture rather than as two isolated institutional functions.

Despite these theoretical arguments and the growing empirical literature, important questions remain concerning the joint effect of corporate governance and audit quality on investment efficiency. Much previous research has examined governance as a direct predictor of investment efficiency or has investigated audit quality as an independent determinant of financial and investment outcomes. Studies synthesizing the governance literature have highlighted the importance of multiple governance antecedents but also point to the need for greater attention to interactions among monitoring mechanisms (3). Similarly, emerging-market evidence on audit quality and board independence indicates that the effectiveness of one monitoring mechanism can depend on the presence of another (17). Theoretical work on audit quality and investment efficiency further suggests that auditing operates within an endogenous information environment in which other information-producing and monitoring institutions influence its economic effects (15). These perspectives suggest that models examining only additive effects may underestimate the way internal and external governance mechanisms jointly affect managerial investment behavior.

The research gap is particularly significant in the Iranian setting. Although earlier Iranian evidence has directly examined whether audit quality affects the relationship between corporate governance and investment efficiency and has reported a moderating role for external audit quality (21), the institutional environment has continued to evolve, while recent research has introduced additional insights into ownership concentration, board diversity, social capital, competitive conditions, reporting practices, audit-market structure, and partner-level audit quality. Contemporary evidence showing that corporate governance interacts with competitive market conditions (12), that governance effects can depend on ownership concentration and board diversity (8), and that social capital strengthens governance-related investment outcomes (10) collectively indicates that investment efficiency is generated by interacting monitoring mechanisms rather than isolated organizational characteristics. At the same time, new evidence concerning audit-market structure (18), audit-partner quality (19), and the association between integrated reporting and auditing outcomes (20) provides a stronger empirical foundation for reconsidering the governance–audit–investment nexus in the contemporary Tehran Stock Exchange.

Understanding this nexus has substantial implications for both corporate theory and capital-market practice. If audit quality merely substitutes for internal governance, firms with strong governance systems may derive little incremental investment benefit from more intensive external assurance. Conversely, if audit quality complements corporate governance, strengthening auditing may amplify the effectiveness of boards, institutional investors, ownership monitoring, and other internal governance mechanisms. The latter possibility is consistent with evidence that governance and transparency jointly reduce information asymmetry in emerging markets (5), with findings that governance and financing structures interact in explaining investment inefficiency (6), and with evidence that governance reforms can improve investment allocation across Asian listed companies (4). It is also consistent with the broader proposition that high-quality auditing enhances the reliability of the information through which governance bodies evaluate corporate actions (13). Identifying whether such complementarity exists is especially important in an emerging capital market where concentrated ownership, heterogeneous governance practices, fragmented external assurance, and heightened informational frictions can magnify the economic consequences of monitoring quality.

Accordingly, the aim of this study is to investigate the moderating effect of audit quality on the relationship between corporate governance and investment efficiency among companies listed on the Tehran Stock Exchange.

Methods and Materials

This study is quantitative and follows a positivist perspective. The research is built on agency theory and information asymmetry frameworks. The current applied research seeks to provide empirical evidence about the moderating role of audit quality in the relationship between corporate governance and investment efficiency in TSE-listed companies. The study employs archival financial data and a descriptive-correlational strategy to evaluate hypotheses via multivariate regression analysis. This methodology is in line with previous studies on governance and investment efficiency in the Iranian setting. Akbari and Emamimibody (2025) studied the moderating effect of social capital on the relationship between governance and investment efficiency through the panel data methodology. Rajaei Zadeh Harandi and Moghis (2022) studied the moderating effect of audit quality on the relationship between corporate governance and investment efficiency using similar regression-based techniques.

1. The statistical population includes all companies listed on the Tehran Stock Exchange in the time of the study. Instead of probabilistic sample procedures, a systematic elimination (screening) method is used, consistent with the tradition of Iranian accounting study. This can be attributed to the high variability of the enterprises listed on the TSE and the fact that data for some characteristics are not available for the entire population. The screening criteria are: (1) sample firms were listed on the TSE before the beginning of the study period to ensure sufficient historical data availability, (2) the fiscal years of sample firms end in March (Esfand) to improve comparability, (3) sample firms did not change their fiscal year or business activity during the period, (4) complete data is available for all research variables, (5) sample firms were not suspended from trading for more than three months in any given year, and (6) the sample firms are not banks, financial institutions, investment companies, or holding companies due to their different financial structures and governance frameworks. This screening process leaves a final sample congruent with current research on Iranian administration. Akbari and Emamimibody (2025) evaluated 161 firms, Khalili (2026) examined 121 firms of TSE and Rajaei Zadeh Harandi and Moghis (2022) used a sample of 108 companies.

2. Data are collected from a variety of archive sources. Financial statement data including total assets, capital expenditures, cash flows, leverage ratio and profitability measures are acquired from the TSE's official database and annual reports of sample enterprises. Corporate governance data, such as board independence, board size, ownership concentration, and institutional ownership, are collected from corporate governance reports and business disclosure forms. Audit quality data comprising auditor identity, audit firm size and auditor industry specialisation are acquired from audit reports and the records of the Iranian Association of Certified Public Accountants. Where available, partner-level audit data are added, exploiting Iran's unique dual-signature audit requirement where both the lead and review partners are required to sign audit views. The data gathering method used in this study is in line with previous Iranian studies that data was acquired from audited financial statements available on the TSE website.
3. Investment efficiency is quantified by using the widely used methodology of Richardson (2006) which forecasts the projected investment levels based on growth prospects, leverage, cash holdings, business age, stock returns and lagged investment. The residual of this model is a measure of investment inefficiency. A positive residual would suggest overinvestment, whereas a negative residual would suggest underinvestment. The absolute value of the residual is the measure of investment efficiency inversely, larger absolute values imply greater inefficiency. This technique has been confirmed in other Iranian studies, such as the study by Akbari, Jafari, and Ahadzadeh (2025) on board social capital and investment decisions.
4. The quality of corporate governance is measured by a composite index that captures the main dimensions of governance: board independence (the proportion of non-executive directors), board size (the natural logarithm of the total number of directors), ownership concentration (the proportion of shares owned by the largest shareholders), and institutional ownership (the proportion of shares owned by institutional investors). This multi-dimensional approach is in line with knowledge that governance measures function interactively and not in isolation as evidenced by Badiei et al. (2026) in their study of ownership concentration, board diversity and environmental governance in Iranian enterprises.
5. Audit quality is determined by different proxies to ensure robustness. The main measure is the size of the audit firm as a dichotomy of large and small audit businesses. A second metric measures auditor industry specialisation, which is the auditor's share of the market in a specific industry divided by total audit fees in that sector. Iranian previous studies use auditor industry specialisation, auditor reputation, auditor tenure and auditor independence as proxies of audit quality. Also, Rajaei Zadeh Harandi and Moghis (2022) examined the governance-investment efficiency relation using audit quality as a moderating variable.
6. In line with previous studies on investment efficiency, a number of control variables are included: firm size (natural log of total assets), financial leverage (total debt / total assets), return on assets (net income / total assets), and sales growth (annual percentage change in sales). These controls account for firm-specific variables that may drive investment behaviour separately from governance and audit quality methods.

The study hypotheses were examined utilising moderated multiple regression analysis using panel data. In the baseline model, we investigate the direct impact of corporate governance on investment efficiency. The moderated model examines the moderating hypothesis by including the interaction term of corporate governance and audit quality. The general form of the regression equation is:

$$\text{Investment Efficiency}_{it} = \beta_0 + \beta_1(\text{Corporate Governance}_{it}) + \beta_2(\text{Audit Quality}_{it}) + \beta_3(\text{Corporate Governance}_{it} \times \text{Audit Quality}_{it}) + \beta_4(\text{Firm Size}_{it}) + \beta_5(\text{Leverage}_{it}) + \beta_6(\text{ROA}_{it}) + \beta_7(\text{Sales Growth}_{it}) + \varepsilon_{it}$$

7. where i is the firm and t is the year. The parameter of interest is the coefficient of interaction β_3 , which captures the moderating effect of audit quality on the governance-investment efficiency relationship. A positive and significant β_3 would suggest that the positive effect of corporate governance on investment efficiency is reinforced by high-quality auditing. This modelling strategy is consistent with the methods utilised by Rajaei Zadeh Harandi and Moghis (2022) who tested the moderating influence of audit quality using composite data based multivariate regression models.
8. Before proceeding to hypothesis testing, many diagnostic procedures are carried out to confirm validity of the panel regression estimates. The Hausman test is used to decide whether fixed effects or random effects estimates is suitable. Therefore, if the null hypothesis is rejected, fixed effects are favoured. The Breusch-Pagan Lagrange Multiplier test is applied to see if pooled OLS is sufficient or if there are panel effects. Heteroskedasticity-robust standard errors are applied to account for potential heteroskedasticity, and multicollinearity among independent variables is investigated via the variance inflation factor. These approaches are in line with the prevailing practice in Iranian panel data research including the methodology applied by Akbari and Emamimibody (2025) and Khalili (2026).

The data analysis is made up of various stages. The first stage consists of descriptive statistics and correlation analysis to describe the sample and to identify potential problems of multicollinearity. Descriptive statistics (means, standard deviations, minimums and maximums) are generated on all variables to offer a general picture of the data distribution and to detect any outliers or abnormalities that may require attention. All independent and control variables are examined for Pearson correlation coefficients, paying special attention to those more than 0.80, which may suggest significant multicollinearity and should be addressed. Variance inflation factors are also computed for all regression models. Values below 10 are acceptable, and values below 5 are desirable.

The main hypotheses are investigated using moderated multiple regression analysis with panel data estimation techniques. The Hausman specification test is applied before the estimate of the model to determine the appropriateness of fixed or random effect estimation for the structure of data. The Hausman test statistic is strongly significant, indicating that the fixed effects estimation is favoured, which presupposes correlation between the unobserved firm-specific effects and the explanatory variables. In contrast, a non-significant result suggests the random effects estimation which is more efficient in the absence of such association.

The baseline model regresses investment efficiency on corporate governance and control factors to identify the direct relationship. The moderated model consists of audit quality and the interplay between corporate governance and audit quality. The interaction coefficient is the key metric in testing the moderating hypothesis. A positive and statistically significant interaction coefficient would indicate that the favourable effect of corporate governance on investment efficiency is intensified by a high level of audit quality, in line with the theoretical proposition that external and internal monitoring procedures are complements.

Several diagnostic procedures are used to check the correctness of the regression estimates. The Breusch-Pagan test is applied to test for heteroskedasticity, and if heteroskedasticity is detected, heteroskedasticity-robust standard errors are utilised to guarantee valid statistical inference. The panel data is subjected to the Wooldridge test for serial correlation to detect autocorrelation and, if present, necessary remedial measures are taken. These adjustments are particularly relevant in accounting and finance panel data where firm level observations are commonly heteroskedastic and autocorrelated, which can lead to biased standard errors and inaccurate inferences if not handled.

To address potential endogeneity problems, especially the notion that corporate governance and audit quality are simultaneously determined with investment efficiency, we employ extra robustness approaches. In additional studies, lagged values of the independent and the moderating variables are employed as instruments to reduce simultaneity bias. As a robustness check we use the System GMM estimator, which is well suited for dynamic panel data when the dependent variables are persistent and potential endogeneity exists. Khalili (2026) in a pioneering study, used the dynamic Generalised Method of Moments to examine the interaction between governance and investment efficiency in Iranian enterprises.

Missing data is addressed through listwise deletion due to the screening criteria which requires complete data for all research variables. Since the data are archival and the screening procedure is methodical, the rate of missing values is small and does not necessitate more advanced imputation techniques. All statistical tests are performed at the 5% level of significance and results at the 1% and 10% levels of significance are also presented for completeness. The study is conducted in sequence starting with descriptive statistics, correlation analysis, baseline regression, moderated regression and ultimately robustness testing.

Findings and Results

This section presents the empirical findings in two parts: descriptive and inferential analysis. All analyses were performed in Stata and panel data estimation approaches were chosen based on diagnostic tests.

Table 1 shows descriptive statistics of all variables. The average investment inefficiency, defined as the absolute value of the residual of the Richardson (2006) model, is 0.087 0.094 . This means that there is a large dispersion in investment behaviour . The average is higher than the median value of 0.061 which indicates a positively skewed distribution with some firms having very high levels of investment inefficiency. This pattern is in line with Akbari and Emamimibody (2025) who reported the similar fluctuation for enterprises listed on the TSE. The lowest value of 0.001 means some firms have investment levels close to the optimal, while the highest of 0.612 means some firms' investment differs a lot from projected investment, which may be caused by significant agency difficulties or financing restrictions.

Table 1. Descriptive Statistics

Variable	Mean	Median	Std. Dev.	Min	Max
Investment Inefficiency	0.087	0.061	0.094	0.001	0.612
Corporate Governance Index	0.542	0.538	0.147	0.182	0.891
Board Independence	0.614	0.600	0.183	0.200	1.000
Board Size (log)	2.241	2.197	0.312	1.609	3.045
Ownership Concentration	0.684	0.712	0.198	0.145	0.976
Institutional Ownership	0.427	0.415	0.231	0.021	0.918
Audit Quality	0.318	0.000	0.466	0.000	1.000
Industry Specialization	0.241	0.187	0.196	0.000	0.783
Firm Size	13.847	13.712	1.492	10.814	18.226
Financial Leverage	0.583	0.591	0.214	0.087	0.947
Return on Assets	0.114	0.098	0.137	-0.312	0.487
Sales Growth	0.187	0.142	0.341	-0.512	1.847

The corporate governance index has a mean of 0.542 with a standard deviation of 0.147. This indicates a modest governance quality with significant variation. The minimum value of 0.182 implies that certain companies have very poor governance frameworks and shareholders may be exposed to considerable agency risks. The mean for board independence is 0.614 which indicates that almost 61 percent of the board members are non-executive directors. The minimum score of 0.200 nonetheless indicates there are some organisations still have boards dominated by executive directors, lowering monitoring effectiveness. This study concurs with Farajzade-Zanjani, Nassirzadeh and Askarany (2026) who found that objectivity of boards is an important driver of the effectiveness of governance in Iran.

Concentration of ownership (mean=0.684) supports the high ownership structure concentration of Iranian enterprises. The median value of 0.712 is higher than the mean, which suggests that more than half of the sample enterprises have ownership concentration greater than 70 percent. This is in line with the results of Khalili (2026) who found a mean of 68.4 percent and recognised concentrated ownership as a possible barrier to effective governance. The typical value of institutional ownership is 0.427, indicating that institutional investors hold a relatively high proportion of shares but not the dominating proportion. The mean of audit quality is 0.318 meaning that around 32 percent of the firm-year observations are audited by big audit firms. The comparatively low proportion is explained by the fragmented Iranian audit sector with the lack of Big 4 firms limiting the availability of high quality external assurance.

Table 2 presents the Pearson correlation matrix. Investment inefficiency is negatively connected with corporate governance ($r = -0.247$, $p < 0.01$) giving initial support for the governance hypothesis. This correlation indicates that organisations with stronger governance mechanisms tend to make more efficient investment choices. Further, audit quality is adversely connected to investment inefficiency ($r = -0.231$, $p < 0.01$) consistent with Rajae Zadeh Harandi and Moghis (2022). Substantial negative relationships are found for board independence ($r = -0.198$, $p < 0.01$) and institutional ownership ($r = -0.213$, $p < 0.01$) indicating that these specific methods work especially well.

Table 2. Pearson Correlation Matrix

Variable	1	2	3	4	5	6	7
1. Investment Inefficiency	1.000						
2. Corporate Governance	-0.247**	1.000					
3. Board Independence	-0.198**	0.612**	1.000				
4. Ownership Concentration	0.156*	-0.287**	-0.198**	1.000			
5. Institutional Ownership	-0.213**	0.498**	0.312**	-0.341**	1.000		
6. Audit Quality	-0.231**	0.298**	0.241**	-0.187**	0.312**	1.000	
7. Firm Size	-0.142*	0.341**	0.287**	-0.198**	0.387**	0.341**	1.000

The results show a positive relation between ownership concentration and investment inefficiency ($r = 0.156$, $p < 0.05$). Thus, ownership concentration exacerbates the agency problem by allowing large shareholders to appropriate private advantages at the expense of smaller shareholders. This is in line with Khalili (2026) who found that ownership concentration combines with bad governance to decrease the efficiency of investment. Firm size is negatively connected to investment inefficiency ($r = -0.142$; $p < 0.05$). Larger organisations are better in terms of efficiency of their investments. This could be due to more expert internal control systems and more analyst coverage. All correlations are below 0.80 and VIF values (max 3.47) do not suggest multicollinearity.

Table 3 reports diagnostic test results. The Hausman test ($\chi^2 = 47.23$, $p < 0.001$) rejects the null hypothesis that there is no association between unobserved firm-specific effects and explanatory variables, indicating that the fixed

effects estimation is appropriate. The Breusch-Pagan LM test ($\chi^2 = 312.47$, $p < 0.001$) indicates the existence of panel effects, therefore validating the use of panel data methods instead of pooled OLS. The Wooldridge test ($F = 8.47$, $p < 0.01$) suggests first-order autocorrelation, and robust standard errors are used to correct for it. There is heteroskedasticity ($\chi^2 = 24.18$, $p < 0.01$) and heteroskedasticity-robust standard errors are necessary to be able to make accurate inference.

Table 3. Diagnostic Test Results

Test	Statistic	p-value	Conclusion
Hausman Test	$\chi^2 = 47.23$	0.000	Fixed effects preferred
Breusch-Pagan LM	$\chi^2 = 312.47$	0.000	Panel effects present
Wooldridge Autocorrelation	$F = 8.47$	0.004	First-order autocorrelation
Heteroskedasticity (BP)	$\chi^2 = 24.18$	0.002	Heteroskedasticity present
VIF (maximum)	3.47	—	No multicollinearity

The baseline regression results are shown in Table 4. The correlation on corporate governance is negative and significant ($\beta = -0.187$, $p < 0.001$), showing that when the governance is stronger the investment inefficiency is lower. An increase in governance by one standard deviation (0.147) reduces investment inefficiency by 0.027, which represents 31 percent of the standard deviation of the dependent variable. This conclusion corroborates Akbari and Emamimibody (2025) and Farajzade-Zanjani, Nassirzadeh, and Askarany (2026). The economic magnitude implies that reforms in governance can effectively curb management opportunism and eliminate information asymmetries that influence investment decisions.

Table 4. Baseline Regression: Corporate Governance and Investment Efficiency

Variable	Coefficient	Std. Error	t-statistic	p-value
Corporate Governance	-0.187	0.042	-4.45	0.000***
Firm Size	-0.024	0.011	-2.18	0.029**
Financial Leverage	0.089	0.031	2.87	0.004***
Return on Assets	-0.142	0.048	-2.96	0.003***
Sales Growth	-0.018	0.014	-1.29	0.198
Constant	0.487	0.156	3.12	0.002***
R-squared (within)	0.312			
F-statistic	28.47***			
Observations	1,218			

Financial leverage is positively associated with investment inefficiency ($\beta = 0.089$, $p < 0.01$), which is consistent with the agency cost of debt arguments that highly leveraged firms may underinvest due to debt overhang difficulties or overinvest to shift wealth from creditors to shareholders. An increase in leverage (0.214) by one standard deviation increases investment inefficiency by 0.019, which is 20 percent of the standard deviation of the dependent variable. Return on assets has a negative relation ($\beta = -0.142$, $p < 0.01$), which indicates that profitable enterprises invest more efficiently. The relation with business size is negative ($\beta = -0.024$, $p < 0.05$), meaning that larger firms have economies of scale in monitoring and have better access to external financing.

Table 5 shows the results of the moderated regression. The interaction term between corporate governance and audit quality is negative and substantial ($\beta = -0.213$, $p < 0.001$), which provides strong support for the moderating hypothesis. The negative sign shows that audit quality enhances the unfavourable association between governance and investment inefficiency. When audit quality is poor, the marginal effect of governance on investment inefficiency

is -0.142, and when audit quality is high, it is -0.355, indicating a 150 percent increase in the effectiveness of governance. This is in line with Wang (2025) and Rajaei Zadeh Harandi and Moghis (2022).

Table 5. Moderated Regression: Audit Quality as Moderator

Variable	Model 1 (Base)	Model 2 (Audit)	Model 3 (Interaction)
Corporate Governance	-0.187*** (0.042)	-0.164*** (0.041)	-0.142*** (0.043)
Audit Quality		-0.098*** (0.024)	-0.087*** (0.026)
CG × Audit Quality			-0.213*** (0.058)
Firm Size	-0.024** (0.011)	-0.021** (0.011)	-0.019** (0.011)
Financial Leverage	0.089*** (0.031)	0.084*** (0.031)	0.081*** (0.031)
Return on Assets	-0.142*** (0.048)	-0.134*** (0.047)	-0.128*** (0.047)
Sales Growth	-0.018 (0.014)	-0.016 (0.014)	-0.015 (0.014)
Constant	0.487*** (0.156)	0.512*** (0.154)	0.534*** (0.153)
R-squared (within)	0.312	0.328	0.347
F-statistic	28.47***	27.12***	26.84***
Observations	1,218	1,218	1,218

The R-squared increases from 0.312 for the baseline model to 0.347 for the interaction model, indicating that the addition of audit quality and its interaction with governance accounts for an additional 3.5 percentage points of variance in investment inefficiency. The F-statistic is still significant at the 1 percent level, supporting the general validity of the model. The coefficient of audit quality alone ($\beta = -0.098$, $p < 0.001$) suggests that high quality auditing directly reduces investment inefficiency, controlling for governance systems.

Table 6 reports robustness checks. First, audit firm size was used as the moderating variable instead of auditor industry specialisation. The interaction term is still negative and significant ($\beta = -0.178$, $p < 0.01$), which supports the moderating impact. Second, the results of the subsample analysis by business size indicate that the moderating impact is significant for both big ($\beta = -0.187$, $p < 0.01$) and small firms ($\beta = -0.241$, $p < 0.01$) but is more pronounced for smaller enterprises. This pattern is in line with the premise that external monitoring is more helpful when internal governance mechanisms are weaker, as Wang (2025) suggests. Third, the System GMM estimator supports the interaction effect ($\beta = -0.196$, $p < 0.01$). The possible endogeneity problem is solved.

Table 6. Robustness Test Results

Specification	Interaction Coefficient	Std. Error	p-value	Observations
Primary (Audit Firm Size)	-0.213***	0.058	0.000	1,218
Alternative (Industry Specialization)	-0.178***	0.052	0.001	1,218
Large Firm Subsample	-0.187***	0.064	0.004	542
Small Firm Subsample	-0.241***	0.071	0.001	676
System GMM Estimation	-0.196***	0.061	0.001	1,218

Alternative measurements, subsamples and estimate methods do not affect the moderating effect. The larger effect for smaller enterprises shows that external monitoring compensates for weaker internal governance in smaller organisations, whereas larger firms benefit from both internal and external monitoring methods. The results strongly suggest that audit quality moderates the relation between corporate governance and investment efficiency in the Iranian environment.

Discussion and Conclusion

The findings of the present study demonstrate that corporate governance is significantly associated with greater investment efficiency among companies listed on the Tehran Stock Exchange. The baseline regression showed that corporate governance had a negative and statistically significant effect on investment inefficiency ($\beta = -0.187$, $p < 0.001$), indicating that stronger governance mechanisms reduce deviations from firms' expected level of investment. This result suggests that improvements in governance structures can constrain both excessive investment in economically unjustified projects and insufficient investment in value-enhancing opportunities. From an agency perspective, stronger governance limits managerial discretion, increases accountability, and improves the monitoring of decisions concerning the allocation of financial resources. The result is consistent with earlier evidence from the Tehran Stock Exchange showing that corporate governance contributes positively to investment efficiency by strengthening transparency, shareholder protection, board effectiveness, and monitoring mechanisms (9). It is also aligned with evidence from Asian listed firms demonstrating that effective governance mechanisms reduce agency conflicts and information asymmetry and thereby facilitate more efficient allocation of corporate resources (4). The finding further corresponds with the broader synthesis by Bhullar and Gupta, who identified board structure, ownership characteristics, institutional monitoring, financial reporting, and auditing as important governance antecedents of investment efficiency (3). Thus, the present findings reinforce the view that investment efficiency is not determined solely by firms' growth opportunities or financing resources but also by the quality of the governance system through which investment decisions are evaluated and controlled.

The negative association between corporate governance and investment inefficiency is also consistent with recent Iranian evidence indicating that the effectiveness of governance becomes particularly important in institutional environments characterized by concentrated ownership and substantial informational frictions. Akbari and Emamimibody found that corporate governance improved investment efficiency and that this relationship became stronger when firms possessed higher levels of social capital (10). Their findings suggest that formal monitoring structures become more effective when supported by relational mechanisms that facilitate information exchange and coordination. Similarly, evidence concerning board social capital in Tehran Stock Exchange firms shows that board-level relationships and networks can augment investment decisions by improving access to information and enhancing the decision-making capacity of directors (11). The present study complements these findings by demonstrating that audit quality represents another important contextual mechanism capable of strengthening the effectiveness of formal corporate governance. Evidence from competitive Islamic capital markets likewise indicates that governance can mitigate distortions in investment decisions associated with competitive pressures, although the effectiveness of different governance dimensions may vary according to the institutional environment (12). Taken together, these studies support a contingency interpretation of corporate governance in which governance quality is beneficial for investment efficiency, but the magnitude of its influence depends on surrounding informational and monitoring mechanisms.

The study also found that audit quality independently reduces investment inefficiency. In the moderated regression model, audit quality had a significant negative coefficient ($\beta = -0.098$, $p < 0.001$), showing that firms receiving higher-quality external audits tend to exhibit investment levels closer to economically expected levels. This finding can be explained by the informational and monitoring roles of auditing. High-quality auditors improve the credibility of financial reports, restrict opportunistic financial reporting, identify material misstatements, and provide boards, investors, creditors, and managers with more reliable information for evaluating investment projects. Francis conceptualized audit quality as a multidimensional outcome of audit inputs, processes, institutional conditions, and engagement-level characteristics, emphasizing that differences in audit quality have meaningful consequences for the reliability of financial reporting (13). The current result suggests that these consequences extend to real corporate decisions concerning resource allocation. The finding is also consistent with Shahzad et al., who showed that both audit quality and financial reporting quality improve investment efficiency by reducing information asymmetry and limiting managerial opportunism (14). Moreover, Langberg and Rothenberg directly linked audit quality to investment efficiency and emphasized the role of auditing within the wider corporate information environment (15). Therefore, the current evidence supports the interpretation of external auditing not simply as a regulatory or compliance requirement but as an economically significant monitoring mechanism that improves investment decision quality.

The principal finding of the study concerns the moderating effect of audit quality on the relationship between corporate governance and investment efficiency. The interaction between corporate governance and audit quality was negative and highly significant ($\beta = -0.213$, $p < 0.001$). Because the dependent variable represents investment inefficiency, this negative interaction indicates that higher audit quality strengthens the beneficial effect of corporate governance on investment efficiency. When audit quality was low, the marginal effect of corporate governance on investment inefficiency was -0.142 , whereas under high audit quality it increased in magnitude to -0.355 . Thus, the effectiveness of governance in reducing inefficient investment was substantially stronger when firms were subject to higher-quality auditing. This finding is particularly important because it indicates that internal governance and external audit mechanisms function as complements rather than independent or substitutive controls. Strong boards and ownership-monitoring structures may establish appropriate oversight, but their effectiveness depends partly on the quality and reliability of the financial information available to them. High-quality auditing strengthens this informational foundation and consequently enhances the ability of governance mechanisms to detect, evaluate, and constrain inefficient investment decisions.

This moderating result is directly consistent with Rajaei Zadeh Harandi and Moghis, who found that audit quality strengthened the relationship between corporate governance and investment efficiency among firms listed on the Tehran Stock Exchange (21). The replication and extension of this relationship using more recent data are important because the Iranian governance and audit environment has continued to develop. The result is also compatible with Wang's evidence that audit quality and board independence interact in shaping investment decisions in emerging markets (17). Both studies support the argument that internal and external monitoring mechanisms reinforce one another. Board independence may be insufficient when directors must rely on financial information whose credibility is uncertain, whereas high-quality audits may have limited effects if internal governing bodies lack the independence or authority required to respond effectively to audit-generated information. Their combination creates a stronger control environment by simultaneously improving information credibility and increasing the capacity to act on that information. This complementary interpretation is further consistent with evidence that

corporate governance and transparency jointly reduce information asymmetry in emerging capital markets (5). The present study therefore extends this logic to investment behavior by showing empirically that improved external assurance increases the investment-related effectiveness of internal governance.

The increase in within-firm explanatory power from $R^2 = 0.312$ in the baseline model to $R^2 = 0.347$ in the interaction model provides further support for the importance of examining governance and auditing jointly. Although this increase is not by itself evidence of causality, it indicates that adding audit quality and its interaction with corporate governance contributes meaningful explanatory information beyond governance and firm-level controls alone. This pattern is consistent with the growing literature suggesting that investment efficiency reflects the combined operation of multiple governance, financing, and information mechanisms. Yadav and Yadav showed that governance interacts with debt maturity in determining investment inefficiency, demonstrating that internal oversight and external financing structures can jointly shape investment behavior (6). Gomariz and Ballesta similarly reported that financial reporting quality and debt maturity interact in influencing investment efficiency, implying that information quality and disciplinary financing mechanisms can partially complement or substitute for one another depending on firm circumstances (2). These findings support the broader proposition that investment inefficiency should be examined using interactive rather than exclusively additive models. The present study adds audit quality to this framework and demonstrates that assurance quality materially changes the effectiveness of internal governance.

The robustness analyses strengthen confidence in this central result. When auditor industry specialization was used as an alternative measure of audit quality, the interaction between corporate governance and audit quality remained negative and significant ($\beta = -0.178$, $p = 0.001$). This suggests that the moderating effect is not dependent on a single operationalization of audit quality. Industry-specialist auditors may provide higher-quality assurance because their greater familiarity with industry-specific transactions, risks, reporting practices, and accounting issues allows them to identify irregularities more effectively and assess corporate financial information more accurately. The Iranian audit-market context makes this result especially meaningful because audit quality varies across audit firms and engagements in a fragmented market. Abbasi Astamal and Ahmad Zadeh showed that audit-market structure is related to both audit quality and audit pricing, emphasizing that institutional characteristics of the audit market can materially shape assurance outcomes (18). Recent evidence concerning individual audit partners similarly indicates that partner-level audit quality is economically consequential in Iran, with higher audit-partner quality being associated with lower stock price crash risk (19). Together with the present findings, these studies suggest that variation in auditor competence and monitoring quality can influence not only reporting and market outcomes but also the efficiency with which firms allocate investment resources.

The findings were also robust when firm size was considered. The moderating effect of audit quality remained significant in both large and small firms, but its magnitude was greater among smaller firms ($\beta = -0.241$) than larger firms ($\beta = -0.187$). One plausible explanation is that smaller firms typically possess less developed internal control systems, lower analyst coverage, fewer specialized governance resources, and higher levels of information asymmetry. Under such conditions, the incremental monitoring and informational benefits provided by a high-quality auditor become particularly valuable. Larger firms, by contrast, may already possess more sophisticated governance processes, internal audit functions, financial expertise, and external monitoring, which can reduce the marginal contribution of audit quality. This result is broadly consistent with Wang's finding that the effects of audit quality depend on the strength of internal governance characteristics (17). It also accords with evidence from

Rompotis and Balios that the economic effects of audit quality vary according to firm circumstances and risk conditions (16). The stronger moderation observed for smaller firms therefore reinforces a contingency view in which the benefits of external assurance are greatest when information asymmetry and internal monitoring limitations are more pronounced.

The descriptive results also provide important contextual insight into the Iranian corporate environment. Ownership concentration averaged 0.684, indicating that a substantial proportion of corporate ownership was held by dominant shareholders. Ownership concentration was positively associated with investment inefficiency, suggesting that concentrated ownership may create governance challenges when controlling shareholders acquire sufficient influence to pursue private benefits or investment strategies that do not fully reflect the interests of minority shareholders. This result aligns with Khalili's evidence showing that ownership concentration can reduce investment efficiency when combined with weaknesses in other dimensions of governance (8). It is also broadly consistent with Badiei et al., who demonstrated that ownership structure has important implications for the financial performance of Tehran Stock Exchange firms (7). Concentration can theoretically reduce classical manager–shareholder agency problems by improving monitoring, but it may simultaneously intensify conflicts between controlling and minority shareholders. The positive association observed in the present study suggests that the latter risk is particularly relevant in the sample under investigation and helps explain why complementary governance and audit mechanisms are necessary.

Among the control variables, financial leverage was positively and significantly related to investment inefficiency ($\beta = 0.089$, $p < 0.01$), whereas return on assets ($\beta = -0.142$, $p < 0.01$) and firm size ($\beta = -0.024$, $p < 0.05$) were negatively associated with investment inefficiency. The positive leverage effect may reflect debt overhang and financing constraints, through which highly leveraged firms reject profitable investment opportunities because a substantial proportion of future returns would accrue to creditors. Alternatively, excessive leverage may generate incentives for risk shifting and investment in projects with undesirable risk–return characteristics. This result is compatible with the broader literature showing that debt characteristics and governance jointly influence investment inefficiency (6). The negative relationship between profitability and investment inefficiency suggests that firms with stronger operating performance possess greater internally generated resources and may face fewer financing constraints when pursuing profitable projects. Larger firms may also benefit from more developed governance systems, better access to capital markets, stronger internal controls, greater analyst coverage, and more extensive monitoring, which together support more efficient investment allocation.

The relevance of audit quality to the governance environment is further reinforced by developments in corporate reporting. Hashemi Dehchi et al. found that integrated reporting is associated with audit quality and audit fees among Tehran Stock Exchange firms (20). This evidence suggests that audit quality does not operate independently of reporting architecture; rather, it is embedded in a broader information system involving managerial disclosure, reporting complexity, external assurance, and board oversight. Improvements in integrated or transparent reporting may facilitate auditing, while high-quality audits can increase confidence in the information used by governance bodies. Likewise, Avinash and Mahesh emphasized that governance and transparency jointly reduce information asymmetry in emerging capital markets (5). The present study adds to this literature by demonstrating that external assurance can strengthen the effect of governance on a real economic outcome, namely investment efficiency. Accordingly, the combined operation of transparency, governance, and auditing appears to constitute an integrated monitoring architecture rather than a collection of isolated corporate practices.

Finally, the System GMM robustness analysis confirmed the significant interaction between governance and audit quality ($\beta = -0.196$, $p = 0.001$), reducing concern that the main findings are attributable solely to simultaneity or endogeneity. This is particularly important because governance quality, audit quality, and investment behavior may be jointly determined. Firms with sophisticated governance structures may intentionally select higher-quality auditors, while firms with more efficient investment systems may also possess broader organizational capabilities that improve both governance and reporting quality. The persistence of the interaction after alternative estimation provides stronger support for the proposition that audit quality materially enhances the governance–investment relationship. Overall, the findings converge with prior Iranian and international evidence and support a complementary-monitoring interpretation: stronger corporate governance reduces investment inefficiency, higher audit quality independently improves investment allocation, and the presence of high-quality auditing substantially increases the effectiveness of governance in constraining inefficient corporate investment.

The present study has several limitations that should be considered when interpreting its findings. First, the analysis relies on archival financial and governance data, meaning that complex qualitative dimensions of corporate governance and audit quality, such as boardroom interactions, directors' actual influence over management, the professional skepticism exercised by auditors, audit committee deliberations, and the nature of auditor–client communications, cannot be directly observed. Second, investment efficiency is estimated using residuals from the Richardson model, and although this approach is widely employed, unexplained investment may partly reflect unobserved growth opportunities, strategic restructuring, industry-specific conditions, or macroeconomic shocks rather than inefficient managerial behavior alone. Third, audit quality is captured through observable proxies such as audit firm size and industry specialization, which cannot represent every dimension of actual engagement quality. Fourth, the study is limited to companies listed on the Tehran Stock Exchange and therefore reflects the distinctive ownership, auditing, regulatory, and economic environment of Iran. Finally, although robustness and dynamic-panel analyses reduce concerns regarding endogeneity, an observational research design cannot establish causal relationships with the same certainty as experimental or quasi-experimental approaches.

Future studies can extend the present findings by examining more detailed dimensions of both corporate governance and audit quality rather than relying primarily on composite measures. Separate investigation of board independence, board expertise, gender diversity, audit committee effectiveness, institutional ownership, managerial ownership, ownership concentration, auditor tenure, partner experience, audit partner rotation, and auditor workload could identify which combinations of internal and external monitoring mechanisms most effectively improve investment efficiency. Future researchers could also use interviews with directors, audit partners, financial managers, and institutional investors to clarify the behavioral mechanisms through which audit quality strengthens governance effectiveness. Comparative analyses involving several emerging markets would help determine whether the observed moderating relationship is specific to Iran or represents a more general feature of economies with concentrated ownership and developing governance systems. Longitudinal studies covering major regulatory reforms could examine whether improvements in governance and auditing standards change the strength of the relationship over time. Researchers may also investigate additional moderators or mediators, including financial reporting quality, integrated reporting, information asymmetry, financing constraints, economic policy uncertainty, product-market competition, social capital, analyst coverage, and institutional investor monitoring.

The findings have several practical implications for corporate managers, boards, auditors, investors, and regulatory authorities. Companies seeking to improve investment efficiency should treat corporate governance and

audit quality as mutually reinforcing elements of an integrated monitoring system rather than as separate compliance activities. Boards should strengthen independent oversight of capital budgeting, require transparent justification for major investments, and ensure that financial information used in investment decisions is subjected to credible external assurance. Firms, particularly smaller companies with less developed internal monitoring systems, may benefit from appointing auditors with stronger industry expertise and sufficient professional resources. Audit firms should recognize that their role extends beyond verifying financial statements because reliable assurance can improve the informational basis on which boards and managers allocate corporate resources. Investors can also evaluate governance quality together with auditor characteristics when assessing the reliability of firms' investment strategies. Regulators should continue strengthening auditor independence, professional competence, industry specialization, disclosure quality, board accountability, and minority-shareholder protection so that improvements in auditing and governance jointly contribute to more efficient allocation of capital within the market.

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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.

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