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Examining the Impact of Environmental Disclosure on Financial Performance: The Moderating Role of Corporate Governance

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Abstract

Assessing corporate performance plays a critical role in economic decision-making. The relationship between Environmental Disclosure (ED) and firm performance is a significant topic in accounting research. Firm performance is influenced by multiple factors, among which ED can have a substantial impact. Financial performance is consistently considered a key indicator for evaluating a company's condition, and various factors can affect it. This study aims to examine the relationship among ED, financial performance, and Corporate Governance (CG) in 112 companies listed on the Tehran Stock Exchange (TSE) and Over-the-Counter market (OTC) between 2016 and 2023. A regression correlation method was employed to test the hypotheses. The results indicate that all proposed hypotheses are supported. Specifically, overall ED has a significant impact on firm performance, and CG positively and significantly moderates the relationship between ED and firm performance.

Keywords: Environmental disclosure, Financial performance, Corporate governance, Companies listed on the tehran stock exchange and over-the-counter market.

1 | Introduction

In today's business environment, attention to environmental issues and sustainability has become a central priority for organizations and firms. Environmental information disclosure is recognized not only as a legal requirement but also as a strategic tool to enhance public image and strengthen trust among investors and stakeholders. Such disclosures can exert a significant impact on a company's financial performance. However, the actual effect of environmental information disclosure on financial performance may be influenced by various factors, including Corporate Governance (CG) [1]. CG refers to the set of procedures, rules, and structures that determine how companies are managed and controlled. It can play a critical moderating role

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in the relationship between Environmental Disclosure (ED) and financial performance. Specifically, the quality and structure of CG may either amplify or attenuate the impact of EDs on financial outcomes [2]. Accordingly, investigating the effect of environmental information disclosure on financial performance while considering the moderating role of CG can provide a deeper understanding of how these factors interact. Such insights can inform strategies to enhance both financial performance and corporate sustainability. This research aims to assist managers, investors, and policymakers in making more informed decisions regarding resource management and financial strategy by clarifying these interrelationships.

2 | Research Background

2.1 | Background of Domestic Research

Abgineh et al. [3] conducted a study to develop a financial performance model based on ED for firms listed on the Tehran Stock Exchange (TSE). The primary objective of this research was to propose a financial performance model grounded in ED practices within these companies. This study employed a mixed-methods approach; from an objective standpoint, it is applied research, while methodologically, it is descriptive-exploratory and descriptive-correlational. Accordingly, the research was conducted in two phases. In the first phase, by reviewing Persian and English literature and applying a seven-step integrated modeling procedure, the relevant variables for the research model were identified and measured. In the second phase, data were collected from listed companies (445 observations from 89 firms between 2016 and 2020) across polluting industries (automotive and oil sectors) and non-polluting industries (food and pharmaceutical sectors) to examine the relationship between ED and financial performance. The findings indicated a significant relationship between ED and financial performance. Furthermore, the level of industry pollution moderated this relationship. Notably, emphasizing ED, particularly in polluting industries, contributes to value creation and the sustainable development of firms.

Jabbar Abd Ali Al-Atbi et al. [4] examined the impact of restating financial statements on the quality and disclosure of voluntary Corporate Social Responsibility (CSR) activities in 100 companies listed on the Stock Exchange (SE), over the period from 2017 to 2021. To test the research hypotheses, the study utilized both logistic regression and linear regression models. The findings suggest that companies that do not restate their financial statements are more motivated to engage in voluntary CSR reporting activities. This result aligns with signaling theory, indicating that firms with lower agency problems and less information asymmetry are more likely to undertake voluntary CSR reporting actions. Therefore, companies should consider engaging in voluntary CSR activities, not only to gain a competitive advantage and signal their commitment but also to benefit from future performance improvements.

Mohammadi et al. [5] examined the relationship between ED and the financial performance of companies listed on the TSE. The study aimed to investigate how ED affects the financial performance of these listed firms. For this purpose, data from 94 companies listed on the TSE over the period 2009 to 2014 were analyzed. This research employed a descriptive–correlational design, and multivariate linear regression was applied for data analysis. The results revealed variability in the relationship between ED practices and financial performance. Specifically, the study found a significant positive relationship between overall ED and profit margin.

Abgineh et al. [6] examined the relationship between changes in the level of social and ED and profitability indicators using the KLD index. The study aimed to investigate how variations in the disclosure of social and environmental issues affect profitability measures. Employing a quasi-experimental design, the research utilized data extracted from financial statements over the period 2001–2014. To test the hypotheses, multiple regression models were applied within a panel data framework and analyzed using the fixed-effects method. The KLD index was employed to assess the social and environmental responsibility of the firms. The results indicated that changes in the level of social and ED are significantly associated with financial performance dimensions, including the operating profit-to-sales ratio. Furthermore, the findings revealed that variations in

social responsibility disclosure are significantly related to both the Return on Equity (ROE) and the return on net assets.

Ghanbari et al. [7], in a study titled “social responsibility, financial performance and institutional ownership reporting”, examined the mediating effect of financial performance on the relationship between CSR and institutional ownership. The study sample consisted of 23 investment companies over the period 2010–2013, analyzed in two stages. In the first stage, the relationship between CSR and financial performance was assessed. In the second stage, the relationship between CSR and institutional ownership was examined, considering the mediating role of financial performance. The results indicated that financial performance significantly mediates the relationship between CSR and institutional ownership.

Mahdavi et al. [8], in a study titled “the relation of firm size, industry type and profitability to social and environmental information disclosure”, investigated the relationship between the level of environmental and social disclosure and certain firm characteristics. An unweighted index was used to measure the level of environmental and social disclosure. The study population comprised companies listed on the TSE, with a sample of 87 firms across various industries for the period 2007–2012. Multivariate regression analysis was employed to test the research hypotheses. The findings indicated a significant positive relationship between firm size and the level of environmental and social disclosure. However, no statistically significant relationship was observed between disclosure levels and profitability. Contrary to the researchers’ expectations, companies operating in sensitive industries exhibited lower levels of environmental and social disclosure compared to firms in non-sensitive industries.

Tanc and Gokoglan [9], in a study titled “the impact of environmental accounting on financial and operational indicators of manufacturing firms”, examined the effect of environmental accounting on financial and operational performance indicators and assessed the positioning of environmental accounting from the perspective of faculty members at the University of Tehran. The study employed Student’s t-test to confirm or reject the proposed hypotheses. Friedman’s test was used to evaluate the relative impact and rank the significance of each factor, while paired t-tests compared expected levels with actual levels. The results demonstrated that environmental accounting significantly affects financial and operational indicators of manufacturing firms, including production volume, reduction in production waste, provision of external technical assistance to other manufacturing firms, types of products produced, and the ratio of long-term debt service (principal and interest repayment) to total liabilities of the firms.

Angelia and Suryaningsih [10], in a study titled “the effect of environmental performance and corporate social responsibility disclosure towards financial performance”, examined theoretical frameworks related to environmental performance, CSR disclosure, and financial performance of firms. Their findings indicate that environmental performance and CSR are now recognized as critical factors in evaluating corporate success. Attention to environmentally and socially aligned processes and products provides significant competitive advantages over comparable firms that rely solely on conventional accounting practices, thereby enhancing market value. Consequently, strong environmental performance and the corresponding fulfillment of CSR responsibilities help mitigate potential risks for firms, facilitating greater investor engagement and, ultimately, improving financial performance. The study further highlights that environmental performance does not exert a direct effect on financial performance; rather, its impact is realized indirectly through the mediating role of CSR disclosure, which enhances corporate financial outcomes.

2.2 | Foreign Research Background

Lin and Qumrozman [11] examined the impact of ED, financial disclosure quality, and information technology adoption on firm performance, exploring whether CG ensures sustainability. The study aimed to investigate the role of environmental and financial disclosure, Information Technology (IT) adoption, and good governance in corporate sustainability over the period 1990–2019. A sample of 75 registered financial institutions in the Bangladesh capital market was selected to collect relevant data. Secondary data sources, including annual reports of the target financial companies, economic review reports, and central bank

publications, were utilized for data compilation. Several econometric techniques were employed to document empirical linkages and the explanatory power of the independent variables on firm performance. Baseline evaluations revealed a positive and significant relationship between corporate sustainability and the explanatory variables. Furthermore, the study extended the empirical assessment using a system-GMM approach, confirming a positive association among financial and ED, IT alignment, good governance, and sustainable firm performance [11].

Su et al. [12] conducted a study to examine the impact of ED on the efficiency of organizational capital allocation and firm performance. This study utilizes econometric modeling and data from highly polluting companies listed on the Chinese stock market between 2013 and 2020 to investigate the impact of ED on capital allocation efficiency and its underlying mechanisms. The results indicate that ED significantly and strongly enhances capital allocation efficiency, with its effect varying based on company size, ownership structure, life cycle, and region. However, employees and creditors serve as negative moderators in this relationship.

Yang et al. [2] conducted a study to examine the impact of the quality of environmental information disclosure on financial performance, with a focus on the moderating effects of internal and external stakeholders. This study analyzes A-share listed companies in the pharmaceutical manufacturing industry in China from 2011 to 2019. The study investigates the impact of environmental information disclosure quality on financial performance, considering the moderating effects of internal and external factors such as environmental regulations, media pressure, and executive compensation. The results indicated that the quality of environmental information disclosure had a negative impact on company performance. This study highlights the difficulty in improving corporate environmental behavior, even under pressure from both internal and external stakeholders, and provides a reference for regulatory authorities to enhance the mechanisms for the quality of environmental information disclosure.

Meng and Zhang [13], in their study, examined the relationship between corporate ED and investor response: evidence from the Chinese capital market. The aim of this paper is to analyze the impact of corporate ED from the perspective of investors. To this end, data on EDs from all listed Chinese companies between 2004 and 2020 were collected, and the impact of annual reports on investor responses was controlled. The findings indicate that listed companies may lack the motivation to engage in environmental management and have little interest in disclosing environmental information. As a result, the government should formulate a mandatory disclosure policy and provide administrative support for environmentally-friendly companies.

Gupta and Gupta [14], in their study titled environmental sustainability effects on corporate performance dimensions through sustainability development: an event from India, examined the impact of environmental sustainability on the performance dimensions of 200 businesses in India. The findings from their research revealed that environmental sustainability has a positive and significant impact on all dimensions of business performance, including financial performance, customer performance, learning performance, and internal processes.

Govindan et al. [15], in their study titled a social sustainability assessment framework for the manufacturing industry in India, selected and evaluated social sustainability indicators based on the existing literature, in collaboration with relevant industry experts and specialists specific to their country. To assign weights to the selected indicators, they conducted surveys, and for their evaluation, they developed a mathematical model suitable for the research environment and conditions. The findings revealed that the work environment and working conditions are the primary factors influencing job satisfaction and lead to improved employee performance outcomes.

Prasad et al. [16], in their study titled CSR and environmental sustainability: an event study on energy power as an indicator of environmental sustainability, examined 100 companies listed on the Bombay Stock Exchange (BSE) over a six-year period. Their findings indicated that CSR does not have a significant relationship with energy power.

Chen et al. [17], in their study, examined CSR and earnings smoothing from the supply chain perspective. The results indicate that companies with higher levels of CSR have greater reliance on supplier and buyer relationships and are associated with lower levels of earnings smoothing. Additionally, it shows that the increased demand for CSR within the supply chain aligns with the interests of shareholders and stakeholders.

Atan et al. [18], in their study, examined the impact of Environmental, Social, and Governance (ESG) factors on corporate performance using data from 54 publicly listed companies in Malaysia during the period from 2010 to 2013. The results showed that there was no significant relationship between environmental and social factors and the profitability and value of the companies.

Zhao et al. [19] conducted a study on companies operating in highly polluting industries in China between 2008 and 2014 to explore the relationship between CG systems, social responsibility disclosure, and the value of these companies. The results of their study indicated that the level of environmental information disclosure by these companies decreased over the examined period. Additionally, various CG factors were found to influence the disclosure of environmental information. Furthermore, while environmental information disclosure had no immediate impact on corporate profitability, it was found to have beneficial long-term effects.

Kabir and Tai [20] conducted a study to examine whether CG facilitates the relationship between CSR and financial performance. To this end, they analyzed companies listed on the Ho Chi Minh Stock Exchange in Vietnam over the period from 2008 to 2013. The results of this study revealed that companies with higher levels of social and environmental responsibility activities tend to have better financial performance. Additionally, the study found that ownership structure, including foreign and government ownership, as well as larger and more independent boards of directors, positively and significantly influence the relationship between CSR and financial performance.

Silva et al. [21] conducted a descriptive and quantitative study to examine the determinants of ED in Brazilian companies. By analyzing sustainability reports alongside the annual financial statements of 97 firms, the study found that company size, environmental auditing, and global sustainability reporting requirements are significantly associated with the corporate sustainability disclosure index and the extent of disclosure. Furthermore, these factors were linked to stock price, the firm's pollution intensity, CG structures, Return on Assets (ROA), and ROE.

Liu et al. [22] conducted a study titled "Does family involvement explain why corporate social responsibility affects earnings management?" to examine how family ownership influences the relationship between earnings management and CSR. The study analyzed a sample of 3,378 firm-year observations from S&P 500 companies over the period 2003–2010. The findings indicated that CSR has no significant association with either real or accrual-based earnings management when family ownership is present.

Menon et al. [23] investigated the relationship between CSR and financial performance and found a direct and positive relationship between CSR and financial performance indicators, including ROE, ROA, and Tobin's Q.

3 | Research Hypotheses

The hypotheses of the present study are formulated as follows:

Hypothesis 1. ED significantly influences the financial performance of companies listed on the TSE and Iran Fara Bourse (IFB).

Hypothesis 2. CG moderates the relationship between ED and financial performance in companies listed on the TSE and IFB.

4 | Research Methodology

This study is applied in nature, meaning that its findings can provide practical insights for investors, managers, brokers, and other stakeholders to support optimal investment decision-making in the stock market.

The research utilizes quantitative data, specifically numerical information extracted from the financial statements of companies listed on the TSE, which were selected through purposive sampling.

From a methodological perspective, the study follows an inductive approach, whereby generalizable conclusions about the entire population are inferred from a sample. In terms of its epistemological nature, the research is positivist, focusing on examining correlations and relationships between variables using correlational research methods and regression analysis.

Temporally, the study is retrospective and ex post facto, as both the dependent and independent variables pertain to events that occurred in the past; accordingly, data from years prior to the study were collected and analyzed.

4.1 | Research Operational Model

$$ROA_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 AGE_{it} + \varepsilon_{i,t} \quad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 CG_{it} + (\beta_3 ED_{it} * CG_{it}) + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 AGE_{it} + \varepsilon_{i,t} \quad (2)$$

- I. ROA: financial performance
- II. ED: environmental disclosure
- III. CG: corporate governance
- IV. Size: firm size
- V. LEV: financial leverage
- VI. AG: firm age
- VII. Constant Term: β_0
- VIII. Component: $\varepsilon_{i,t}$ Regression model error
- IX. β_0, β_1 variable coefficients

4.2 | Research Variables

4.2.1 | Dependent variable: financial performance

One of the most commonly used metrics for measuring financial performance, based on the studies of Brigham and Houston [24], is ROA. ROA is calculated by dividing a company's net income by its total assets.

$$ROA_{it} = \frac{NI_{it}}{TA_{it}} \quad (3)$$

Based on the above equation:

- I. ROA_{it} : financial performance of firm i in year t
- II. NI_{it} : net income of firm i in year t
- III. TA_{it} : total assets of firm i in year t
- IV. i : each firm i in year t
- V. t : time period

4.2.2 | Independent variable: environmental disclosure

The ED score, encompassing economic, environmental, and social activities, is measured as an average value and is calculated using the following model [25], [26].

X_i is assigned a value of 1 if firm i meets the criteria, and 0 otherwise: n_{ini} represents the expected number of criteria for firm i . The values fall within the following ranges for each topic: economic topics (GRI 200), environmental topics (GRI 300), and social topics (GRI 400).

$$\begin{aligned} \text{CSR_ECONOMIC}_i &= \frac{\sum X_i}{n_i} \\ \text{CSR_ENVIRONMENT}_i &= \frac{\sum X_i}{n_i} \\ \text{CSR_SOCIAL}_i &= \frac{\sum X_i}{n_i} \\ \text{CSR_ALL} &= \frac{\sum X_i}{n_i} \end{aligned} \quad (4)$$

4.2.3 | Moderating variable: corporate governance

The moderating variable in this study is the quality of CG, which is composed of multiple factors. Therefore, a composite and multidimensional measure is employed to assess this variable. Using a multidimensional composite measure for CG offers several advantages: it allows a single variable to enter the regression model instead of considering each governance component separately, it accounts for the optimization of specific mechanisms at the firm level, and it prevents redundancy and overlap among components. In this study, the quality of CG is measured using the model proposed by Gompers et al. [27], which is one of the comprehensive CG frameworks developed for the Iranian context. By reviewing the components of CG models from studies conducted in various countries and international rating agencies, four dimensions—ownership effects, shareholder rights, transparency, and board effectiveness—were selected, as they are commonly included across most models. Each dimension comprises 3 to 4 components, and each component includes multiple indicators, totaling 93 indicators. These indicators are measured through structured survey questions, and in this model, the weights of each dimension, component, and indicator are determined using a scientifically rigorous method applied for data analysis.

Each indicator is assigned two weights: one within its component and one within the overall model. After firms are scored 0 or 1 for each indicator, the score is first multiplied by the indicator weight within the component to calculate the score for each dimension, and then multiplied by the indicator weight in the overall model to determine the firm's overall CG quality score.

4.2.4 | Control variables

Firm size

Various metrics can be used to determine firm size, including total assets, sales, and market value. In this study, total assets are employed as the measure of firm size. To reduce skewness, the natural logarithm of the values is taken. Accordingly, the firm size variable is calculated using the natural logarithm of the total assets of firm i at the end of period t [28].

$$\text{SIZE} = \text{Log}(\text{asset}). \quad (5)$$

Financial leverage

In this study, LEV (capital structure) is measured using the ratio of total debt to total assets of the firm, as follows [29], [30].

$$\text{LEV}_{it} = \frac{\text{TD}_{it}}{\text{TA}_{it}}. \quad (6)$$

Based on the above equation:

- I. LEV_{it} : LEV of firm i in year t
- II. TD_{it} : total debt of firm i in year t
- III. TA_{it} : total assets of firm i in year t
- IV. i : each firm in year t
- V. t : time period

Firm age

The natural logarithm of the firm's age, measured as the number of years since establishment [31].

$$AGE = \text{Log}(AGE). \quad (7)$$

5 | Population and Sampling Method

The population of this study consists of companies listed on the TSE and IFB. The rationale for selecting this population is that the Securities and Exchange Organization of Tehran provides relatively comprehensive information on firms' financial and economic performance. It can be considered the primary source of financial data that enables access to company-level information and allows for the empirical testing of the proposed research model.

To select the study sample, a systematic elimination sampling method will be employed. In this approach, the necessary criteria for inclusion are first defined, and then firms that do not meet these criteria are excluded. The study sample will be selected according to the following guidelines:

- I. The companies must have been listed on the TSE prior to 2016 and remain listed through the end of 2023.
- II. Companies must not have changed their fiscal year during the sample period, and each company's fiscal period must consist of a single financial year (365 days); preferably, for consistency and ease of calculation, the fiscal year should start on March 21 and end on March 20 of the following year.
- III. The necessary financial and operational data for the companies must be available and complete throughout the study period.
- IV. To ensure comparability in the classification and type of financial statement items, selected companies must not belong to certain sectors, including banks, credit institutions and other monetary organizations, other financial intermediaries, financial investment companies, and diversified industrial conglomerates.

Considering the criteria outlined above, and applying the systematic elimination method, a total of 112 companies were selected from the population as the study sample.

6 | Research Findings

6.1 | Descriptive Statistics of the Research Variables

Table 1. Descriptive statistics of the quantitative research variables.

Skewness	Standard Deviation	Maximum	Minimum	Median	Mean	Variable
0.608	0.161425	0.83035	-0.40446	0.128129	0.155257	Financial performance (ROA)
0.647	0.207741	1.0000	0.07143	0.357143	0.420839	ED
0.065	0.213921	1.27394	0.012730	0.538993	0.538814	CG
0.938	0.59378	21.32763	11.2526	14.76387	15.05499	Firm Size (Size)
0.065	0.213921	1.27394	0.01273	0.53899	0.538814	LEV
0.163	0.208709	1.82607	0.69897	1.34242	1.365592	Firm age (AGE)

Number of observations: 896, Sample size: 112, Study period: 2016–2023.

Table 1 presents the central tendency and dispersion measures for the research variables. The data cover an eight-year period from 2016 to 2023 for 112 firms, collected on an annual basis. Among descriptive statistics, the mean is considered the most informative measure for quantitative data, while the standard deviation is preferred for assessing variability. For example, financial performance exhibits a mean, median, and standard deviation of 0.155257, 0.128129, and 0.161425, respectively, indicating that the firms under study achieved an average ROA of approximately 15%, with a variability of $\pm 16\%$ around this mean. The maximum and minimum values are 0.83035 and -0.40446, respectively, reflecting that the most and least successful firms achieved returns on assets of approximately 83% and -40%, respectively.

6.2 |Unit Root Test of the Variables

Before estimating any regression, it is necessary to test the reliability and stationarity of the variables to ensure that the regression is not spurious and that the results are valid. Reliability of the research variables implies that their means and variances remain constant over time, and that the covariances between variables across different years are stable. Consequently, using these variables in the model does not lead to spurious regression. To this end, the study employs the Levin, Lin, and Chu (LLC) test to assess the stationarity of the variables.

Table 2. Unit root test results.

Levin–Lin–Chu (LLC) Unit Root Test			
Test result	Test statistic and significance level	Variable symbol	Variable symbol
Stationary	0	-8.916	Financial performance (ROA)
Stationary	0	-10.392	ED
Stationary	0	-13.483	CG
Stationary	0	-4.938	Firm size (Size)
Stationary	0	-13.487	LEV
Stationary	0	-41.35	Firm age (AGE)

Table 3. Estimation results of research model 1.

Dependent Variable: Financial Performance						
$ROA_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 SIZE_{it} + \beta_3 LEV_{it} + \beta_4 AGE_{it} + \varepsilon_{i,t}$						
Type of Relationship	Result	P-value	t-statistic	Standard Deviation	Coefficient	Variable Symbol/Variable
Inverse	Supported	0.000	11.791	0.089	-0.400	Intercept
Direct	Supported	0.000	11.791	0.043	0.515	ED
Rejected		0.094	1.675	0.007	0.011	Firm size (Size)
Inverse	Supported	0.000	19.403	0.027	-0.528	LEV
Direct	Supported	0.000	5.456	0.091	0.5004	Firm age (AGE)

$R^2 = 0.73$, D.W = 1.55, F = 18.391(0.000), $R^2_{UR} = 0.69$.

As shown in Table 2, all research variables are stationary at the 0% significance level. It can be concluded that all data are reliable (do not contain a unit root), and the stationarity of the data indicates that the regression model estimates in subsequent stages will not be spurious.

As shown in Table 2, all research variables are stationary at the 0% significance level. It can be concluded that all data are reliable (do not contain a unit root), and the stationarity of the data indicates that the regression model estimates in subsequent stages will not be spurious.

6.3 | Results of the Research Hypothesis Tests

Hypothesis 1. ED has a significant effect on financial performance in firms listed on the TSE and IFB.

To examine the above hypothesis using the information presented in *Table 3*, it can be stated that the significance level for ED is 0.000, with a t-statistic of 11.791 and a coefficient of 0.515. Since the p-value is less than 0.05, it can be concluded that there is a direct and statistically significant relationship between ED and financial performance. Therefore, the above hypothesis—namely, “ED has a significant effect on financial performance in firms listed on the TSE and IFB”—is supported at the 95% confidence level.

Hypothesis 2. CG moderates the relationship between ED and financial performance in firms listed on the TSE and IFB.

Table 4. Estimation results of research model (2).

Dependent Variable: Financial Performance						
$ROA_{it} = \beta_0 + \beta_1 ED_{it} + \beta_2 CG_{it} + (\beta_3 ED_{it} * CG_{it}) + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 AGE_{it} + \epsilon_{it}$						
Type of Relationship	Result	P-value	t-statistic	Standard Deviation	Coefficient	Variable Symbol/ Variable
Inverse	Supported	0.000	-4.613	0.093	-0.431	Intercept
Direct	Supported	0.000	3.084	0.076	0.235	ED
Direct	Supported	0.000	4.142	1.126	4.666	CG
Direct	Supported	0.000	12.103	0.011	0.138	ED × CG
Rejected		0.093	1.677	0.007	0.011	Firm size (SIZE)
Rejected		0.678	-0.414	11.264	-4.671	LEV
Direct	Has	0.000	5.446	0.091	0.499	Firm age (AGE)

$R^2 = 0.73$, D.W = 1.55, F=18.082 (0.000), $R^2_{UR} = 0.69$.

To examine the above hypothesis using the information presented in *Table 4*, it can be stated that the significance level for the interaction term (ED × CG) is 0.000, with a t-statistic of 12.103 and a coefficient of 0.138. Since the p-value is less than 0.05, it can be concluded that CG significantly moderates the relationship between ED and financial performance in firms listed on the TSE and IFB. Therefore, the above hypothesis—namely, “CG moderates the relationship between ED and financial performance in firms listed on the TSE and IFB”—is supported at the 95% confidence level.

7 | Conclusion

The presence of effective CG practices accelerates firm growth, reflecting the proactive formulation of corporate strategies and their implementation along a defined path for future development. Regardless of the target group’s interest in engaging with firms, accountability and transparency enhance organizational reputation and promote faster growth in financial indicators. Moreover, in contemporary contexts, the majority of shareholders have shown a willingness to participate on boards of directors to assume responsibility for the firm’s market position and its economic standing. As a direct consequence of failures in several large organizations worldwide, there has been renewed emphasis on the performance and conduct of boards of directors. Corporate boards, often composed of senior management members, are responsible for guiding the overall strategic direction of the business. Effective CG functions as a critical foundation, playing a key role in the success of business investments managed by entrepreneurs. According to Whitman, institutional investors favor firms with strong governance structures—such as independent boards, audit committees, and CEO duality—because these mechanisms tend to reduce earnings management, which serves as a positive indicator of financial disclosure quality.

Recommendations based on the research hypotheses

Based on the research findings and the confirmation of the study hypotheses, the following practical recommendations are proposed:

- I. Considering the significant impact of ED on firms' financial performance, it is recommended that companies listed on the TSE and IFB enhance the scope and accuracy of their environmental reporting to promote transparency and CSR. Such measures can improve investors' perceptions, strengthen public trust, and ultimately enhance financial performance.
- II. Given the moderating role of CG in the relationship between ED and financial performance, it is recommended that regulatory bodies, such as the Securities and Exchange Organization, design and implement policies to strengthen CG mechanisms. These measures may include increasing the independence of board members, establishing effective audit committees, and enhancing informational transparency, thereby enabling firms to leverage environmental reporting more effectively and improve their financial outcomes.

Research limitations

There is always a possibility of disruptive or interfering factors in research that may impede normal procedures and affect the results, as is the case in any other study. The attenuation of research findings reflects the influence of these unintended factors, which in some instances may become more pronounced. In any case, controlling for and accounting for the impact of such factors is of critical importance for the integrity of the study. The main limitations of the present research are as follows: access to the required data—which is often a significant challenge in the TSE—led to the exclusion of certain companies from the sample. Furthermore, the reduction in sample size for some tests may have affected their statistical power. Nevertheless, efforts were made to ensure that, by maintaining a minimum meaningful sample size, the results of the study retained sufficient validity and reliability.

Recommendations for future research

Future researchers are recommended to consider the following in their studies: researchers may categorize firms into profitable versus loss-making companies, as well as small versus large firms, to examine the impact of ED and CG on firm performance.

Author Contributions

Maryam Hajiali led the development of the research framework, specified the empirical model, and coordinated the overall study. Mina Sheikhi Gorjan carried out data compilation and statistical estimation, and contributed to interpreting the empirical results. Adel Shahvali Zadeh supported the theoretical development, reviewed prior studies, and performed critical revisions to improve the manuscript. All authors contributed to writing and approved the final version.

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Data Availability

The empirical analysis is based on financial information of firms listed on the Tehran Stock Exchange and the OTC market over the period 2016–2023. The dataset used in this study can be shared in an organized format upon request from the corresponding author.

Conflicts of Interest

The authors state that no financial or personal relationships have influenced the outcomes of this research.

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