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The Impact of Artificial Intelligence Adoption on Environmental, Social, and Corporate Governance Disclosure Quality and Financial Performance in the Tehran Stock Exchange: Testing the Mediating Role of Disclosure

Habibolah Kazemi[1], Roya Darabi[2]

1. PhD Student in Accounting, Islamic Azad University, South Tehran Branch, Tehran, Iran. *H.kazemi4001@iau.ac.ir*
2. Department of Accounting, Islamic Azad University, South Tehran Branch, Tehran, Iran. *Royadarabi110@yahoo.com*

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***Correspondence:**
Habibolah Kazemi
H.kazemi4001@iau.ac.ir

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Abstract

The main objective of this study is to assess the effect of artificial intelligence (AI) adoption in Iranian listed companies during 2021–2024 on enhancing the quality of environmental, social, and corporate governance (ESG) disclosure and its consequences for financial performance. To this end, we construct a firmlevel AI Adoption Index (covering technology infrastructure, data governance, human capital, strategy, and use cases) and an ESG Disclosure Quality Index (covering compliance with standards, depth of materiality assessment, and transparency in stakeholder engagement). Descriptive results show that the average AI adoption intensity is 59 out of 100, the average disclosure quality is 42 out of 100, the mean return on assets is 7.3%, the mean return on equity 12.9%, and the mean Tobin's Q 1.33 .Using panel regressions with industry and year fixed effects and two stage least squares with instrumental variables (employing industry–year peer average disclosure quality and regulatory guidance as instruments), the findings indicate that AI adoption significantly increases disclosure quality. Instrumented disclosure quality has a positive and significant effect on return on assets (coefficient ≈ 0.0016) and return on equity (coefficient ≈ 0.0018), but is not significant for Tobin's Q .A bootstrap based mediation analysis further shows that a substantial portion of AI's impact on accounting returns is transmitted through improved disclosure quality (mediation share for return on assets ≈ 1.01 and for return on equity ≈ 0.98), whereas the mediation effect for Tobin's Q is not significant (share ≈ 0.85). Robustness checks based on alternative measures, size and industry subsamples, and additional macroeconomic controls confirm the findings. Overall, the results suggest that AI supported reporting systems enhance transparency and operating performance, although reflecting these improvements in market valuation may require a longer time horizon and stronger capital market institutions.

Keywords: Artificial intelligence, ESG disclosure, 2SLS/IV, Mediation, Panel data, Tehran Stock Exchange, Corporate governance, financial performance**.**

JEL Classification: (C53, C45, C61).

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INTRODUCTION

The adoption of AI in companies is rapidly moving beyond operational automation to a dynamic capability that can significantly improve the quality of environmental, social responsibility, and corporate governance disclosure; a broad body of evidence suggests that AI deployment enhances ESG score/quality through green innovation pathways and supply chain efficiency, as well as through improved external disclosure and monitoring processes, and this effect is stronger in the context of digital maturity and digital senior management teams (Y. Liu et al., 2025; Wang et al., 2025; Yang & Yang, 2025; Yu et al., 2025). In emerging markets, the use of AI in reporting and disclosure is also associated with greater transparency and reduced information asymmetry, leading to improved disclosure quality (Alshareef, 2025). This body of evidence, from a resource-based and dynamic capabilities perspective, suggests that AI not only increases the capacity to generate and control environmental and social data, but also improves governance accountability by standardizing and accelerating the disclosure cycle (L. Liu et al., 2025; Yang & Yang, 2025). Despite the rapid growth of the AI-organizational sustainability nexus literature, several key gaps remain: first, most studies focus on the overall sustainability score and do not causally measure the quality of sustainability disclosure (as a distinct and measurable construct); second, evidence of disclosure mediation in transmitting the effect of AI to accounting financial performance is sparse and mostly outside emerging markets, and the results are inconsistent on market valuation; third, firm-level measures of AI adoption are often crude or unidimensional proxies, and the design of exogenous instruments to address endogeneity is rare; fourth, the role of corporate governance boundary conditions (board independence, CEO duality, audit committee) and digital maturity in strengthening/weakening the effects is less clear; fifth, most evidence comes from China and a few limited markets, and the Iranian context of macro instability, industry heterogeneity, and specific information characteristics is almost completely unexplored. This research addresses these gaps by constructing a multidimensional index of AI adoption, focusing on the quality of sustainability disclosure of the mediation test, and applying and sustainability analyses to a sample of Iranian companies.

In this study, disclosure is considered a key mediator between AI adoption and firm performance outcomes: AI deployment first improves the quality of disclosure, reduces information asymmetry, improves external oversight, and standardizes reporting, which in turn improves accounting returns and, in the longer term, reduces the cost of capital. Emerging empirical evidence suggests that much of the impact of AI on performance passes through the channel of sustainability disclosure quality (Alshareef, 2025), and in some contexts, ESG plays a significant mediating role between AI and sustainability performance (Xiao & Xiao, 2025). On the outcomes side, the extensive ESG literature on performance has also documented a positive relationship with firm value and profitability, as well as lower cost of debt (Apergis et al., 2022; Bamel et al., 2025). Furthermore, the presence of investors with ESG preferences strengthens the disclosure-performance relationship (Chen & Xie, 2022), and in times of crisis, the protective function of ESG is more pronounced (Broadstock et al., 2021). Alongside this forward path, the literature also points to a two-way interaction: better ESG performance can itself foster greater AI adoption by reducing financial distress (Zhu & Kong, 2025); thus, our mediation framework emphasizes the path of AI on disclosure and on performance, while also considering the possibility of institutional and financial feedbacks.

From a methodological perspective, the empirical framework of this study is based on firm-year panel data and has three layers: (1) baseline estimation with industry and year fixed effects and clustered standard errors at the firm level to measure the link between AI adoption and disclosure quality; (2) identify the causal path of disclosure quality → financial performance with two-stage instrumental variables using the average of industry-year peer disclosure quality and regulatory guidance as instruments, along the lines of strategies also observed in large panel studies and endogeneity control (e.g.,(Alshareef, 2025; L. Liu et al., 2025; Yang & Yang, 2025); and (3) measure mediation by combining path estimates and bootstraps with several thousand replicates to estimate the indirect effect and confidence intervals.

In the stability analyses, we use alternative measures of AI and disclosure, heterogeneity cuts (firm size/industry pollution intensity), and macro controls; in case of time/dynamic sensitivity, we use a system to control for dynamic endogeneity and Hansen and AR(1)/AR(2) tests. This design, while aligning with mechanism-based evidence on innovation and disclosure channels, allows for direct testing of causal hypotheses and reporting of direct/indirect effects. Among the prominent studies in this area, (Y. Liu et al., 2025) show with large company-year data that AI adoption through green innovation channel and supply chain efficiency enhances all dimensions of sustainability; (Yang & Yang, 2025) introduce mechanisms to reduce financial distress, strengthen external monitoring and improve disclosure as the main pathways to enhance sustainability performance; (Wang et al., 2025) highlight the role of digital transformation in enhancing the effect of AI on sustainability and the heterogeneity of results across industries and regions; Along the loop of results, (Alshareef, 2025) shows that the improvement in the quality of sustainability disclosure caused by AI explains a large part of its effect on accounting returns and therefore disclosure mediation is key; And in the disclosure-performance link, (Chen et al., 2026) show, using a causal design based on differences in step differences, that sustainability disclosure improves financial performance and the presence of sustainability-preferred investors strengthens this relationship.

METHODOLOGY

This research is a quantitative-post-event study with a combined reliance on archived data (reporting texts) and organizational survey. The econometric design includes a three-way causal chain: (1) AI→ESG with dynamics and endogeneity control, (2) ESG→performance with instrumentation, and (3) mediation test. The population, sample, and time period of this study are all non-banking and non-insurance companies listed on the Iranian Stock Exchange and OTC with continuous access to annual/sustainability reports over a period of at least three years (e.g., 1400 to 1403). The sampling method is available with the condition of complete data coverage. Companies without sufficient disclosure are excluded. Corporate Disclosure and Governance: Kodal system and official website of companies (annual report, board of directors' report, ESG). Financial statements and markets: Audited financial statements, stock market price and value (stock exchange/over-the-counter).

Organizational Survey: A researcher-made structured questionnaire (based on variables extracted from the research background) to measure the dimensions of readiness and application of AI in reporting and sustainability. In the present study, a continuous and reproducible MATLAB environment has been defined to measure the index of “Strength of AI Adoption” and “Quality of Environmental Disclosure, Social Responsibility and Corporate Governance”. For AI, the text of annual/sustainability reports was first processed with text mining modules (tokenization, rooting, removal of stopwords and regular patterns) to extract practical clues such as data collection automation, predictive analytics, text mining and smart dashboards; then this textual evidence was merged with the results of the organizational questionnaire in the dimensions of technological infrastructure, data strategy and governance, skills/culture and alignment with sustainability goals. All items were Z-scored at the 1% and 99% company-year levels and then normalized to a 0–100 scale; Internal reliability was measured with Cronbach’s alpha and composite reliability/mean extracted variance, and weights were estimated by principal component analysis or factor analysis to produce an index “AI_Int” on a numerical scale of 0–100. For “quality of sustainability disclosure,” the GRI-2021 framework items were mapped to three dimensions of compliance with general/subjective standards, depth of materiality and methodology assessment, and stakeholder transparency/linkage to strategy; the micro-textual/quantitative indicators were extracted, cleaned, and normalized, and the total index was reported as a weighted average of the dimensions on the 0–100 range. In the outcome variables, return on assets and return on equity are calculated from the financial statements and Tobin's Q ratio is estimated as market value to book value; to reduce simultaneity, balance sheet variables are included in the model with lags. Control variables include natural log of assets, financial leverage, firm age, market-to-book ratio, return volatility and governance indicators (board independence, CEO duality, audit committee), standardization and multicollinearity control are entered, and industry/year fixed effects are applied through dummy variables.

The entire process is implemented as MATLAB scripts and the CSV outputs (AI_Int and ESG_Q and the final matrix of variables) are directly used in fixed effects estimation, and bootstrap mediation with error clustering at the firm level, and the path "AI → Disclosure → Performance" is evaluated with precision and repeatability.

RESULTS

The results of the hypothesis test show that the first hypothesis is confirmed: the intensity of AI adoption positively enhances the quality of ESG disclosure with a large and highly significant coefficient, and the governance indicators also act in line (the CEO dichotomy has a negative effect and the audit committee has a positive effect). In the second hypothesis, the quality of instrumented ESG disclosure has a positive and significant causal effect on accounting performance (ROA and ROE), but for market valuation (Tobin's Q), a positive effect was observed but was not statistically significant. For the third hypothesis, the mediation of ESG disclosure quality is significant and the majority of the AI effect passes through this channel; while for Q, no significant mediation was obtained.

CONCLUSION

The research findings provide a clear picture of investment in AI capabilities, from infrastructure and data governance to strategy and analytical applications, directly improving the quality of ESG disclosure in Iranian companies. This improvement is particularly reflected in accounting returns (ROA/ROE); however, there is no conclusive evidence for market valuation (Tobin's Q), which could be due to the short time horizon of the sample, macro uncertainties, or the limited efficiency of the capital market in absorbing non-financial disclosure signals. At the same time, corporate governance patterns matter: the presence of an audit committee is associated with better disclosure, and CEO ambivalence is associated with reduced disclosure quality.

The results support the view of organizational resources and dynamic capabilities:

AI as a knowledge enabler first makes disclosure/reporting processes more efficient and then improves operational performance through the channel of transparency and accountability. The non-significance of the effect on Q indicates that the transition from operational to valuation effects requires time and supportive institutions (standardization, accreditation of ESG ratings, analytical coverage). Also, the effect of industry peers in the first stage indicates that social/competitive learning plays an important instrumental role in ESG.

Contribution of Authors

All authors participated in the process of writing the article, collecting data, and analyzing it.

Ethical Approval

All stages of the research were conducted with the informed consent of the participants, and their information will remain confidential.

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Conflict of Interest

No conflicts of interest have been declared by the authors.

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References

Alshareef, M. N. (2025). Artificial intelligence-enhanced environmental, social, and governance disclosure quality and financial performance nexus in Saudi listed companies under vision 2030. Sustainability, 17(16), 7421. https://doi.org/10.3390/su17167421

Amini, Y., & Mashayekhi, B. (2022). Presenting a model of factors affecting underpricing in initial public offerings with emphasis on the role of accounting information. Empirical Accounting Research, 12(2), 175-214 [in Persian]. https://doi.org/doi:%2010.22051/jera.2021.32655.2716

Apergis, N., Poufinas, T., & Antonopoulos, A. (2022). ESG scores and cost of debt. Energy Economics, 112, 106186. https://doi.org/10.1016/j.eneco.2022.106186

Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. Borsa Istanbul Review, 22, S119-S127. https://doi.org/10.1016/j.bir.2022.11.006

Bamel, N., Khatri, K., Bamel, U., & Kumar, S. (2025). ESG disclosure and firm performance in global south economy: Does industry profile and board independence moderate the relationship. International Review of Economics & Finance, 100, 104093. https://doi.org/10.1016/j.iref.2025.104093

Barzegar, M., & Jahani, M. (2025). Investigating the role of artificial intelligence in strategic management accounting in financial organizations using the hybrid Delphi fuzzy method. Strategic Management Accounting, 2 (4), 22, 45 [in Persian]. https://doi.org/10.22034/smajournal.2026.541507.1118

Broadstock, D. C., Chan, K., Cheng, L. T., & Wang, X. (2021). The role of ESG performance during times of financial crisis: Evidence from COVID-19 in China. Finance research letters, 38, 101716. https://doi.org/10.1016/j.frl.2020.101716

Chen, K.-H., Zhang, Y., Elston, J. A., Chen, P.-H., & Hsu, K.-H. (2026). Environmental, social, and governance (ESG) initiative scores and firm performance: the importance and role of firm size: Chen et al. Small Business Economics, 66(1), 71-95. https://doi.org/10.1007/s11187-025-01096-1

Chen, Z., & Xie, G. (2022). ESG disclosure and financial performance: Moderating role of ESG investors. International Review of Financial Analysis, 83, 102291. https://doi.org/10.1016/j.irfa.2022.102291

Darabi, R., & Dolatshahi, M. (2025). The Effect of Artificial Intelligence on Budgeting Optimization and Financial Forecasting Accuracy in Management Accounting: A Case Study of Manufacturing Companies in Tehran Province. Strategic Management Accounting, 2(2), 21-42 [in Persian]. https://doi.org/10.22034/smajournal.2025.518968.1014

Du, Z., & Chen, C. (2025). AI vs. ESG? Uncovering a Bidirectional Struggle in China's Sustainable Finance. Sustainability, 17(9), 4238. https://doi.org/10.3390/su17094238

Eyvazloo, R., Raei, R., & Rezaei, F. (2024). The role of market entry time in strengthening or weakening the investors' Disposition Effect. Financial Management Perspective, 14(46), 33-58 [in Persian]. https://doi.org/10.48308/jfmp.2024.104904

Hagh parast, A. A., Abbasi, M., Salehi, A. H. & Vahedian Ghaffari, A. (2025). Investigating the Impact of Artificial Intelligence on the Quality of Managerial Accounting Information (A Case Study of Companies Listed on the Stock Exchange). *Strategic Management Accounting*, *2*(2), 79–98. [in Persian]. https://doi.org/10.22034/smajournal.2025.512751.1009

Liu, L., Wang, X., Tang, L., Sun, Z., & Wang, X. (2025). Exploring the conditional ESG payoff of AI adoption: The roles of learning capability, digital TMT, and operational slack. Systems, 13(6), 399. https://doi.org/10.3390/systems13060399

Liu, Y., Song, J., Zhou, B., & Liu, J. (2025). Artificial intelligence applications and corporate ESG performance. International Review of Economics & Finance, 104, 104559. https://doi.org/10.1016/j.iref.2025.104559

Mahmoudabadi, M., & Torkzaban, A. (2026). Analyzing and Ranking of Critical Success Factors in the Integration of Artificial Intelligence and Circular Economy for Achieving a Smart and Sustainable Supply Chain with the DEMATEL Approach. Strategic Management Accounting, 3(1), 1-31 [in Persian]. https://doi.org/10.22034/smajournal.2026.565578.1280

Namazi, & Khademi, S. (2024). Investigating the usefulness of management commentary: The perspectives of users, producers, and regulatory and supervisory institutions. Quarterly Journal of the Iranian Stock Exchange, 16(64), 107-146. https://doi.org/doi:%2010.22034/JSE.2023.12109.2068

Nooraei, Yarijani, M., & Forouzan. (2014). The effect of organizational environment variables on the relationship between firm sustainability performance and the speed of leverage adjustment. Green Development Management Studies, 3(1), 116-134 [in Persian]. https://doi.org/doi:%2010.22077/jgdms.2024.7247.1072

Pourrezaei Nav, A., Didar, H., & Ghayour, F. (2024). Investigating the mediating effect of credit rating on the relationship between corporate governance quality and stock liquidity based on the composite liquidity approach. Financial accounting research, 16(1), 27-50 [in Persian]. https://doi.org/10.22108/far.2024.141603.2048

Shaghaghi, & Mashaykh. (2023). The relationship between management overconfidence, social responsibility, company performance and financial constraints. Financial Accounting and Auditing Research, 15(60), 79-106 [in Persian]. https://sanad.iau.ir/Journal/faar/Article/1073764

Wang, C., Zhang, Y., & Miao, Y. (2025). Artificial intelligence and corporate ESG: Evidence from Chinese listed enterprises. Finance research letters, 108547. https://doi.org/10.1016/j.frl.2025.108547

Xiao, Y., & Xiao, L. (2025). The impact of artificial intelligence-driven ESG performance on sustainable development of central state-owned enterprises listed companies. Scientific Reports, 15(1), 8548. https://doi.org/10.1038/s41598-025-93694-y

Yang, G., & Yang, X. (2025). AI adoption and ESG performance: Evidence from China. International Review of Economics & Finance, 104659. https://doi.org/10.1016/j.iref.2025.104659

Yu, X., Fan, L., & Yu, Y. (2025). Artificial intelligence and corporate ESG performance: a mechanism analysis based on corporate efficiency and external environment. Sustainability, 17(9), 3819. https://doi.org/10.3390/su17093819

Zhu, N., & Kong, L. (2025). Corporate ESG performance and artificial intelligence adoption: mediating role based on financing constraints. Total Quality Management & Business Excellence, 36(15-16), 1551-1565. https://doi.org/10.1080/14783363.2025.2571522