

# The Moderating Role of Green Tax on the Relationship Between ESG Performance and Environmental Pollution

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## ABSTRACT

**Manuscript type:** Research paper

**Research aims:** Environmental, social, and governance (ESG) compliance can enhance business performance and contribute to sustainable development by reducing pollutants; however, this assertion lacks substantial evidence in practice. Therefore, this study investigates how ESG performance affects environmental pollutants and the role of the Green Tax law in moderating this relationship. The primary contribution

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of this research is to analyse the impact of ESG performance on pollutants and investigate the moderating effect of the Green Tax law. The study specifically examines whether the assertion of compliance with ESG requirements reduces pollution or if it instead facilitates greenwashing, thereby masking the true environmental impact.

**Design/Methodology/Approach:** Using multiple regression and panel data analysis, data from 91 companies listed on the Tehran Stock Exchange (TSE) between 2020 and 2022 were analyzed.

**Research findings:** Higher ESG performance is associated with increased pollution, and the Green Tax law significantly amplifies this effect.

**Theoretical contribution/Originality:** The findings suggest that ESG performance is linked to increased pollution, indicating potential for greenwashing. ESG reporting legitimises businesses and reduces litigation risk, with companies exploiting gaps in the law to maintain pollution levels.

**Practitioner/Policy implication:** The study highlights greenwashing in publicly listed companies. Recommendations include implementing climate policies, promoting renewable energy sources, increasing employee awareness, encouraging whistleblowing, implementing green taxes, and training inspectors and other stakeholders.

**Research Limitations:** The findings are limited by the short three-year study period and the restricted sample of TSE-listed firms, which constrain the generalisability of the results across broader contexts and longer time horizons. Future studies incorporating extended time frames, additional industries, and more comprehensive environmental reporting would provide deeper insight into long-term ESG dynamics and greenwashing behaviour.

**Keywords:** Environmental Pollutant Emissions, Environmental, Social, and Corporate Governance Performance, Green Tax Law, Greenwashing Approach, Legitimacy Theory

**JEL Classification:** M48, Q56, H23

## 1. Introduction

Facing both environmental challenges, like greenhouse gas emissions (Ioannou et al., 2022) and climate change (Oyewo, 2023), and social issues, such as inadequate employee support and a poor grasp of customer priorities (Ye & Xu, 2023), have made ESG reporting crucial for a wide range of stakeholders, including investors, environmental groups, governments, and regulators. Companies are today struggling to effectively measure their ESG performance as these concerns become more pressing (Baratta et al., 2023; Pears et al., 2023). In Iran, ongoing environmental and social challenges, from high fossil fuel consumption and rising pollution (International Energy Agency, 2021; Taghizadeh et al., 2023) to gender inequality (Behboodi-Moghadam et al., 2018) and

a lack of clear governance (Mashayekhi & Bazaz, 2008), have led to the implementation of legislative measures, including taxation policies. Economic development programs, specifically the Fifth and Seventh Development Plans, have been introduced to enhance ESG performance.

Studying environmental pollutants through the lens of ESG practices is therefore vital. This allows researchers to evaluate the impact of corporate governance mechanisms, such as ESG committees, on environmental outcomes. It also helps to differentiate between companies that make genuine progress toward sustainability and those that primarily engage in greenwashing to enhance their public image. Exploring the link between ESG practices and environmental pollutants further enables policymakers to assess the effectiveness of regulatory frameworks in reducing environmental damage. By highlighting this relationship, such studies offer valuable insights into how firms can effectively tackle pollution and contribute to global sustainability goals.

In Iran, ESG disclosure is still in its early stages and remains largely voluntary. The most visible efforts come from state-owned enterprises, cross-listed companies, and industries facing export scrutiny due to international sanctions. Before 2015, sustainability communication was rare and usually presented as corporate philanthropy. However, between 2015 and 2018, references to “sustainability” began to appear more frequently in Codal.ir<sup>1</sup> filings, especially within the petrochemical and banking sectors. These disclosures were driven more by image management than by regulatory requirements. Since 2019, the Securities and Exchange Organization (SEO) of Iran has encouraged environmental and governance reporting. Nevertheless, the lack of fully adopted global frameworks, such as the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB), has resulted in disclosures that are inconsistent and mostly qualitative, thereby increasing the risk of greenwashing (Farivar, 2016). Globally, ESG disclosure has evolved in a more structured way. Initially, reporting was voluntary and focused on corporate social responsibility. Over the past decade, there has been substantial progress in standardisation efforts, notably demonstrated by the European Union’s (EU) Non-Financial Reporting Directive, the implementation of new sustainability disclosure requirements by Asian stock exchanges, and the establishment of specialised sustainability indices. A major turning point came in 2021 with the establishment of the International Sustainability Standards Board (ISSB) and the elevation

of climate-related disclosure under the Task Force on Climate-related Financial Disclosures (TCFD) framework by the Group of Seven (G7) and Group of Twenty (G20) (Campopiano & De Massis, 2015; Lynne Bujaki & Durocher, 2020). Today, many jurisdictions, including the EU with its Corporate Sustainability Reporting Directive (CSRD) mandate, the US with its Securities and Exchange Commission (SEC) climate risk proposals, and Singapore with its exchange rules, require large listed firms to report ESG performance with external assurance. This reflects a decisive global shift from aspirational statements to enforceable sustainability accountability (Liang & Renneboog, 2017; Christensen et al., 2021).

The literature reveals two contrasting perspectives on the impact of ESG practices on environmental pollution. The first perspective, grounded in management theory, argues that strong ESG practices lead to reduced carbon dioxide (CO<sub>2</sub>) emissions (Engert & Baumgartner, 2016; Yunus et al., 2016; Zhou et al., 2022; Pan et al., 2022; Liu & Xu, 2022; Wen et al., 2022). Studies supporting this view highlight that corporate compliance with environmental regulations and the adoption of green technologies foster improved environmental performance and long-term sustainability. In contrast, other research points to a positive relationship between ESG compliance and increased ecological emissions, often attributing this to greenwashing. In this view, companies may disclose ESG information primarily to enhance their public image or mitigate legal risks, while their actual operations may still contribute to environmental impacts (Herold & Lee, 2019; Reid & Toffel, 2009; Wang et al., 2023).

Recent studies highlight positive outcomes of green practices, such as green financing for innovation (Kong et al., 2024), digital transformation through green technologies (Ye & Xu, 2023), and voluntary environmental reporting (Jiang & Tang, 2023). However, challenges remain, including opportunistic managerial behavior (Oyewo, 2023), questions about the effectiveness of corporate governance mechanisms like ESG committees (Tanthanongsakkun et al., 2023), and the limitations of strict government regulations (Luo & Tang, 2023) in reducing greenhouse gas emissions. These conflicting findings underscore the need for further research, especially in diverse governance settings and emerging markets.

A notable policy development in this context is Iran's Green Tax law, enacted in the mid-2010s as part of a broader reform of the national environmental taxation system (Ansari, 2018). This law replaced earlier, less effective measures, such as tariffs on

high-emission vehicles, and was implemented under the Sixth Five-Year Development Plan (2017–2021). The Green Tax law requires companies to pay taxes proportional to their pollution output, with rates determined by the severity of emissions and compliance with the Department of Environment regulations. It also offers financial incentives to encourage the adoption of cleaner technologies (Khazai, 2017). Despite these provisions, the law's effectiveness has been hampered by challenges in emissions monitoring, industrial lobbying, and inconsistencies between domestic and international environmental standards. There is ongoing debate over whether tax revenues should be integrated into the national budget or embarked specifically for environmental remediation projects. Globally, green tax policies are increasingly recognized as critical tools for promoting corporate compliance with sustainability standards. Financial penalties for environmental violations serve both as deterrents and as incentives for companies to reduce pollution (Tanthanongsakkun et al., 2023; Luo & Tang, 2023).

Evidence suggests that well-designed green regulations can facilitate the adoption of environmentally friendly technologies and reduce their firms' environmental footprint (Kong & Li, 2024). For example, green financing has been shown to incentivise the uptake of green technologies (Ye & Xu, 2023). However, the success of such policies depends on effective enforcement, political commitment, and genuine corporate compliance (Oyewo, 2023). Without these, the intended benefits may be undermined by opportunistic behaviour or weak governance.

Further research is needed to examine the moderating effect of green tax regulations on greenhouse gas emissions, particularly in emerging economies where environmental governance may be underdeveloped or in transition (Mashayekhi & Bazaz, 2008). In Iran, where environmental degradation remains a significant concern, green taxes have the potential to reduce pollution and steer industries toward more sustainable practices.

Given the limited research on the relationship between ESG practices and pollution, as well as the moderating role of environmental regulations in emerging markets, this study aims to: (1) investigate the link between ESG performance and environmental pollution, and (2) assess the moderating effect of the Green Tax law on this relationship within the Iranian capital market. By exploring whether ESG disclosure genuinely drives environmental improvement or merely serves as a tool for greenwashing, this research offers insights for policymakers, governments, investors,

and environmental advocates regarding the role of regulatory frameworks in shaping ESG practices and reducing pollution. The findings also highlight the importance of regulations in planning, taxation, investment decisions, and stakeholder engagement to address environmental challenges.

This study is structured as follows: first, the literature review and hypothesis development section introduce the foundational theories and concepts related to ESG and environmental performance. Next, the research methodology is described, detailing data collection and regression analysis procedures. The empirical results are then presented and discussed, followed by the study's conclusions and implications.

## **1. Literature Review and Hypothesis Development**

### **1.1 *The Impact of ESG Performance on Environmental Pollutants***

Legitimacy risk arising from neglected ESG values has become a critical concern for stakeholders in today's business environment. Numerous studies have demonstrated that ESG factors are fundamental to a corporation's legitimacy, as they shape public perception and stakeholder trust (O'Donovan, 2002; O'Dwyer, 2002; De Silva Lokuwaduge & Heenetigala, 2016; Duque-Grisales & Aguilera-Caracuel, 2019; Alda, 2021; Cojoianu et al., 2022). According to organisational legitimacy theory, firms require broad societal support and endorsement to ensure their stability and long-term survival in the marketplace. As a result, companies engage in ESG reporting to maintain legitimacy and meet stakeholder expectations. However, the pursuit of legitimacy can sometimes lead firms to prioritise symbolic ESG disclosures over substantive environmental actions (Lyon & Maxwell, 2011; Qian & Schaltegger, 2017). This means that while companies may report on ESG initiatives to enhance their image or reduce regulatory scrutiny, these disclosures do not always correspond to genuine improvements in sustainability. This divergence helps explain why ESG reporting does not always translate into actual environmental or social progress (Milne et al., 2009). Losing legitimacy signals a lack of public support, which exposes companies to significant business and financial risks (Deephouse & Carter, 2005; Clarkson et al., 2008; Luo et al., 2017). Such risks can escalate to severe consequences, including bankruptcy, operational shutdowns, and going-concern issues (Delmas & Burbano, 2011). For instance, Cojoianu et al. (2022) have shown that effective ESG communication, especially during crises, can help

companies maintain or restore their legitimacy, thereby mitigating the risks of backlash and revenue loss. Ultimately, failure to engage meaningfully with ESG issues can result in a loss of legitimacy and heightened business risk. To remain credible and competitive, companies must deliver both substantive ESG performance and transparent reporting (Duanmu et al., 2018). Firms that successfully integrate ESG principles tend to attract greater investor confidence, leading to improved financial outcomes and a stronger competitive position (Cho & Patten, 2007; Patten, 2015).

Previous research indicates that companies seeking to enter international markets attract heightened attention from stakeholders, including environmental activists and informed investors, largely due to their ESG disclosures. This increased scrutiny can lead to positive financial outcomes, as stakeholders reward transparency and responsible practices (Cho & Patten, 2007; Patten, 2015). For example, Hwang et al. (2021) found that firms with stronger ESG performance outperformed their industry counterparts during crises such as the COVID-19 pandemic, both in financial results and market valuations. Similarly, recent studies suggest that robust ESG performance strengthens a company's relationship with stakeholders, providing a buffer against crises and enhancing resilience (Gabr & ElBannan, 2024). However, the relationship between ESG performance and financial outcomes is not always straightforward. While positive ESG performance can foster investor trust and confidence, the impact varies across industries and regions, and some studies report mixed results. This inconsistency highlights the complexity of linking ESG activities directly to financial performance.

A key challenge lies in the accuracy and presentation of ESG indicators. While initial ESG disclosures may be factually correct, companies sometimes present an overly positive view of their overall performance, even if only certain aspects are strong (Sandberg et al., 2023). Investors, aware of this possibility, often monitor companies with weaker ESG records to assess whether genuine improvements are being made over time. This process of ongoing scrutiny can help companies regain legitimacy and improve their standing in capital markets. Nonetheless, some firms engage in greenwashing, deliberately misleading stakeholders and the public by exaggerating or fabricating ESG achievements (Lyon & Maxwell, 2011; Qian & Schaltegger, 2017). Such practices may temporarily enhance a company's image or attract customers, but they ultimately undermine the credibility of ESG reports and erode stakeholder trust (Ioannou et al., 2022).

Greenwashing is a deceptive practice where companies misrepresent their performance in ESG activities. Research by Cuadrado-Ballesteros et al. (2015) suggests that managers strategically employ greenwashing to attract clients who increasingly value ESG matters. Over time, this can destabilise capital markets and damage the company's reputation, as seen in high-profile scandals like "Dieselgate" (Vollero, 2022). Adhering to ESG standards requires companies to integrate these principles into their core values and operations. Delmas and Toffel (2004) argue that beyond reputational benefits, ESG reporting can also help mitigate legal risks, as compliance with regulations may protect firms from environmental penalties.

Moreover, some experts link compliance with international human rights organisations' guidelines to the practice of ESG reporting (Ferrell et al., 2016). Adhering to these standards can enhance a company's bargaining power and global reputation. Consequently, businesses increasingly use ESG reporting to assess the social, financial, and environmental impacts of their projects (Marquis & Qian, 2014). Ramírez-García and Díez Spelz (2020) highlight the value of integrating a human rights perspective into corporate social responsibility, emphasising moral obligations to avoid causing harm, especially in a globalised world. They argue that human rights should be regarded as "moral absolutes" that companies must uphold to maintain legitimacy in the international marketplace. De Jong et al. (2018) emphasises that greenwashing, misleading stakeholders about a company's environmental or social performance, can severely damage corporate achievements and public trust. For example, Vollero (2022) discusses how Volkswagen's Dieselgate scandal, along with cases involving Nestlé and Golden Agri Resources, involved greenwashing that led to some of the worst reputational crises in recent history. These companies were found guilty of presenting a misleading image of sustainability, which ultimately undermined their credibility and long-term relationship with customers and investors. Such cases illustrate the danger of prioritising image over genuine environmental efforts and underscore the need for clear guidelines to ensure effective and honest communication.

Further research shows that persistent greenwashing can erode long-term stakeholder relationships (Leonidou & Skarmeas, 2017). Trust is central in these dynamics, and once lost, it is difficult for companies to regain credibility. This loss of trust can have lasting negative effects on market position and investor confidence. While greenwashing may offer short-term benefits, its harmful

consequences highlight the critical importance of authentic and transparent ESG policies. Frank et al. (2013) provide evidence that greenwashing lowers consumer trust and reduces customer loyalty, ultimately damaging a company's market standing.

Navigating the relationship between genuine ESG efforts and greenwashing presents a complex challenge for modern companies striving to meet corporate responsibility goals and consumer expectations (Garczarek, 2024). Firms must carefully balance short-term gains with the need to build lasting trust and credibility with stakeholders. Achieving this balance is essential for sustaining long-term success and stability in the stock market.

In conclusion, while ESG reporting is vital for attracting stakeholders and maintaining credibility, greenwashing undermines these efforts by damaging trust and legitimacy and therefore must be avoided. Companies should prioritise genuine ESG practices over superficial compliance to achieve lasting sustainability and credibility. This approach not only benefits businesses but also advances broader societal goals by aligning corporate actions with public values.

Drawing from both legitimacy theory and the perspective of greenwashing, two competing predictions emerge regarding the relationship between a company's ESG performance and its level of environmental pollutants. Accordingly, the first hypothesis of this research is presented as follows:

*H<sub>1</sub>: ESG performance affects the level of environmental pollutants.*

## **1.2 The Moderating Role of Green Tax on the Impact of ESG Performance on Environmental Pollutants**

Countries worldwide face significant ESG challenges, worsened by rapid and severe climate change (Sun et al., 2024). Legislators, with strong influence over corporate behavior, have enacted economic, social, and environmental laws to restore balance (Suttipun & Dechthanabodin, 2022). Chief among these is the EU's CSRD, which prioritises compliance monitoring, particularly for environmental toxicity, to track firms' environmental footprints. Compared to other major frameworks, such as the SASB standards in the US and Japan's Ministry of the Environment guidelines, the CSRD is more stringent, emphasising comprehensive reporting and mandatory disclosures (Krivogorsky, 2024). These differences reveal distinct regional priorities for addressing ESG issues. Legitimacy theory provides a useful lens for understanding these dynamics. It suggests organisations seek legitimacy by aligning with societal norms and

expectations and clarifying how companies navigate and may manipulate regulations.

Despite the explanatory power of legitimacy theory, research suggests that firms often use environmental laws to bolster their image rather than achieve meaningful ecological gains (Jamali & Mirshak, 2007; Carroll, 2016). By exploiting legal loopholes, companies can create a positive public image, thereby reducing their exposure to litigation and reputational damage (Galán-Valdivieso et al., 2019; Martey et al., 2023; Abeywardana et al., 2023). This exploitation is achieved through mechanisms such as selective disclosure of favorable environmental figures while omitting problematic data, engaging in symbolic actions without real impact, and manipulating certifications or reporting standards to appear compliant. This deceptive dynamic, often known as greenwashing (Liu et al., 2023), can heighten stakeholder vigilance but does not necessarily curb harmful practices.

Several high-profile corporate cases illustrate that stricter environmental regulations and enhanced ESG reporting can unintentionally foster symbolic compliance, concealing deteriorating environmental outcomes (Client Earth, 2019). For instance, while stricter rules and ESG requirements prompted Volkswagen to market environmentally friendly vehicles, the company also deployed software to manipulate emissions tests, resulting in engines emitting up to 40 times the legal nitrogen oxide limit. Similarly, as regulations and reporting standards became more stringent, BP rebranded as “Beyond Petroleum” and installed solar panels at service stations. Nevertheless, over 96 per cent of its capital expenditure continued to be allocated to oil and gas, and despite a 15 per cent increase in ESG ratings, BP’s carbon emissions fell by only 2 per cent. Coca-Cola, under mounting public and regulatory pressure for sustainability, announced bottle-recycling programs but remained the world’s leading plastic polluter for years. Nestlé also pledged to use recyclable packaging as reporting demands increased, yet its progress was largely aspirational, as evidenced by its repeated inclusion in global plastic polluter rankings. As regulations become stricter, ESG disclosures may appear more robust, with firms focusing on meeting reporting criteria. However, actual environmental performance often stagnates or worsens, as companies prioritize reputation management over substantive change. This pattern, where ESG metrics improve while emissions remain unchanged or increase, reflects concerns highlighted by Gatti et al. (2021). They argue that strong ESG claims driven by regulation may actually signal greater harm. Analyses by

Boiral et al. (2020) and Li et al. (2023) further demonstrate that stricter legal requirements increase the visibility of ESG activities but can obscure profit-driven, pollution-increasing practices.

Drawing on legitimacy theory's greenwashing perspective, we predict that stricter environmental laws, rather than correcting the imbalance between ESG performance and pollution, may exacerbate it. Firms are incentivised to maximise ESG scores while strategically maintaining or increasing harmful outputs. To address these challenges, policymakers should consider targeted measures, such as closing legal loopholes, particularly those related to comprehensive emissions reporting and the ambiguous definition of sustainable practices. Enhancing the rigor of ESG audits through mandatory external verification and industry-wide standardisation can help ensure genuine compliance. Aligning regulations with meaningful environmental improvements, rather than superficial compliance, is essential. Additionally, fostering transparency and accountability through mandatory public disclosure of environmental performance data, such as detailed carbon footprint and waste management reports, can further discourage greenwashing. Implementing penalties for non-compliance and incentives for achieving accurate sustainability benchmarks can also play a crucial role in aligning corporate practices with legal and environmental expectations.

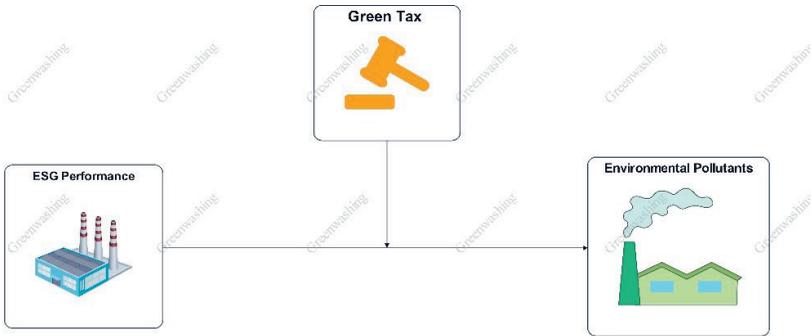
Therefore, the second hypothesis of this research is as follows:

*H<sub>2</sub>: Green Tax positively moderates the relationship between ESG performance and environmental pollutants.*

### **1.3 Theoretical Conceptual**

A review of literature indicates that ESG performance, by enhancing reputation and legitimacy, ultimately reduces litigation risk in the context of greenwashing, which can lead to increased environmental pollutant consumption. Additionally, according to the legitimacy theory (greenwashing approach), the Green Tax law reduces litigation risk and, in the presence of greenwashing, leads to increased consumption of environmental pollutants. The conceptual model of this research is illustrated in Figure 1.

**Figure 1: Theoretical Framework**



## 2. Research Method

### 2.1 Sampling

Defining the appropriate population is essential for achieving true randomness and minimising the risk of accidental selection. The most effective approach is to use data-driven cleaning of companies listed on the stock exchange (Tucker & Zarowin, 2006; Chu et al., 2016). This study applies data cleaning of companies listed on the TSE from 2020 to 2022. Since 2021, Iranian regulations have introduced advanced Green Tax laws for all polluting firms. In the data cleaning process, approximately 59 per cent of firms were excluded from the population due to their involvement in finance, non-polluting activities, or ceased operations. Additionally, 17 per cent of firms lacked consistent financial and non-financial reporting over the three-year period. This rigorous data cleaning enables researchers to identify suitable populations for analysis. The details of our data cleaning process are presented in Table 1.

**Table 1: The Data Cleaning**

Title	Number
Total TSE by the end of 2022 <sup>2</sup>	380
Companies that are financial intermediaries and holdings	(108)
Companies for which pollutant consumption data were not available	(85)
Companies that had ceased operations during the mentioned years	(31)
Companies whose fiscal year does not end on March 20	(49)
Companies that changed their fiscal year during the study period	(16)
Net number of companies	91

## 2.2 Definition

In this study, ESG performance is assessed based on ESG disclosure rather than direct operational outcomes. Specifically, we evaluate how companies communicate their ESG activities through reports and public filings, following established frameworks such as GRI, UNGC, ISO 26000, Bloomberg ESG metrics, and the DJSI. This disclosure-based approach reflects the information firms choose to present to stakeholders regarding their ESG commitments. While such reporting offers valuable insights into corporate responsibility, it may not fully capture actual practices, leaving room for symbolic actions or greenwashing. By focusing on ESG disclosure, this study captures how firms use reporting as a tool for legitimacy, credibility, and stakeholder engagement, an essential aspect of analysing the relationship between ESG performance, environmental pollution, and the moderating effect of Green Tax.

**Table 2: The Role and Measurement of Variables**

Role	Variables	Measurement	References
Independent	ESG Performance	Using a checklist consisting of GRI, the United Nations Global Compact Framework (UNGC), ISO 26000 management guidelines, the Bloomberg rating system, and the Dow Jones Sustainability Index (DJSI)	Fakhari et al. (2018)
Dependent	Environmental pollutants (EN_CON)	Annual fuel and energy consumption of companies	Ye and Xu (2023)
Moderator	Green Tax Law (LAW) dummy variable	years 2020 and 2022 value one and otherwise zero	Approved by the Iran Tax Organization (2021)
Control	Q-Tobin (QT)	(market value of common stock + book value of liabilities) / assets at the end of the period	Jiang et al. (2023)

Role	Variables	Measurement	References	
	Loss	dummy variable	Losing companies value one and otherwise value zero	Hwang et al. (2021).
	Institutional Shareholders (IO)		The per centage of institutional shareholders with ownership of more than 0.5 <sup>3</sup>	Guo (2023)
	Board Independence (BI)	dummy variable	The per centage of independent members of the board of directors who are above the median value is one, and otherwise zero	
	Diversity in Board Expertise (BD)	dummy variable	The per centage of variation in expertise that is higher than the median value of one and less than the value of zero	Khanchel (2007)
Control	Type of audit firm (AS)	dummy variable	Audited by the audit organization and applicable driver value one and otherwise zero <sup>4</sup>	
	Company size (SIZE)		Natural logarithm of assets	Dechow et al. (1996)
	Sales Growth (SG)		(Sales of the current year - Sales of the previous year)/Sales of the previous year	Lee et al. (2005)
	Quick Liquidity Ratio (Acid Test)		(cash + short-term investment)/current debt	Jiang et al. (2023)
	Financial leverage (LEV)		Debt/Equity	Ye and Xu (2023)
	Profitability (PROF)		Net profit/total assets	Galán-Valdivieso et al. (2019)
	Company Age (AGE)		The natural logarithm of the year of establishment of the company in the stock market	Tommasetti et al. (2019)

### 2.3 *Role of Control Variables in Enhancing the Regression Analysis*

To accurately assess the impact of ESG performance on environmental pollutants, we control for several firm-specific variables that could independently influence ecological outcomes. Q-Tobin (Jiang et al., 2023) captures intrinsic firm value, while the Loss dummy (Hwang et al., 2021) accounts for financial distress, which may reduce environmental investments and thus pollution. Institutional Ownership (Guo, 2023) and Board Independence (Khanchel, 2007) reflect governance structures influencing environmental behavior regardless of ESG policies. Board Expertise, Diversity, and Audit Firm Type (Khanchel, 2007) control for board capacity and transparency, which can influence environmental policy. Company Size (Dechow et al., 1996), Sales Growth (Lee et al., 2005), Liquidity (Jiang et al., 2023), and Financial Leverage (Ye & Xu, 2023) represent firm characteristics that enable the implementation of environmental strategies. Profitability (Galán-Valdivieso et al., 2019) ensures that pollutant reductions are not merely a result of stronger financial performance. Company Age (Tommasetti et al., 2019) controls for maturity in environmental management. Including these control variables strengthens the regression analysis by ensuring that observed changes in environmental pollutants are attributable to ESG efforts rather than confounding firm characteristics.

Adding these control variables ensures that the regression results accurately reflect the relationship between ESG performance and the pollutants emitted by firms. The model accounts for factors such as financial health, governance structure, liquidity, and company size to improve the accuracy of its findings and mitigate omitted variable bias.

ESG performance is measured using the index developed by Fakhari et al. (2018), which employs the Analytic Hierarchy Process (AHP) method. This technique involves pairwise comparisons of various ESG sub-dimensions to determine their relative importance. Expert judgments convert these comparisons into numerical weights, resulting in a composite ESG performance score. The detailed model and assigned weights are presented in Table 3.

$$\text{ESG} = 0.077 \text{ E1} + 0.147 \text{ E2} + 0.113 \text{ E3} + 0.069 \text{ S1} + 0.093 \text{ S2} + 0.124 \text{ S3} + 0.100 \text{ S4} + 0.079 \text{ G1} + 0.089 \text{ G2} + 0.107 \text{ G3} \text{ (Fakhari et al., 2018)}$$

**Table 3: ESG Measurement (Fakhari et al., 2018)**

ESG	Index
Environmental Variable	E1 General Environmental Issues
	E2 Impact on Nature
	E3 Environmental Management
Social Variable	S1 General Social Issues
	S2 Social Management System
	S3 Human Rights
	S4 Society
Corporate Governance Variable	G1 General Management Issues
	G2 Board of Directors and Committees
	G3 Legality

Given the inflationary conditions in Iran’s economy, the data have been adjusted accordingly: (1) Annual inflation rates for 2020, 2021, and 2022, as reported by the Central Bank of Iran,<sup>5</sup> were 0.471, 0.462, and 0.465, respectively. (2) These rates were applied to non-dummy variables, including environmental pollutant consumption, Tobin’s Q, firm size, sales growth, liquidity, financial leverage, and profitability, that could be distorted by inflation. The adjustment formula is as follows:

*Neutralization of Inflation*

$$= \left[ \frac{1}{1 + \text{Rate of Inflation}} \right] * \text{Quantity of Variables} \quad \text{Eq (1)}$$

## 2.4 Research Model

Finally, the regression models used in this research are presented as follows:

The 1<sup>st</sup> Hypothesis:

$$Df\_EN_{Con} = \beta_0 + \beta_1 ESG_{it} + \beta_2 QT_{it} + \beta_3 LOSS_{it} + \beta_4 IO_{it} + \beta_5 BI_{it} + \beta_6 BD_{it} + \beta_7 AS_{it} + \beta_8 SIZE_{it} + \beta_9 SG_{it} + \beta_{10} Acid\ Test_{it} + \beta_{12} LEV_{it} + \beta_{13} PROF_{it} + \beta_{14} AGE_{it} + \sum \gamma_j ind + \sum \theta_k Year + \varepsilon_{it} \quad \text{Eq (2)}$$

The 2<sup>nd</sup> Hypothesis:

$$\begin{aligned}
 Df\_EN_{con} = & \beta_0 + \beta_1 ESG_{it} + \beta_2 LAW_{it} + \beta_3 ESG_{it} * LAW_{it} + \beta_4 QT_{it} + \beta_4 LOSS_{it} \\
 & + \beta_5 IO_{it} + \beta_6 BI_{it} + \beta_7 BD_{it} + \beta_8 AS_{it} + \beta_9 SIZE_{it} + \beta_{10} SG_{it} \\
 & + \beta_{11} Acid\ Test_{it} + \beta_{13} LEV_{it} + \beta_{14} PROF_{it} + \beta_{15} AGE_{it} \\
 & + \sum \gamma_j Ind + \sum \theta_k Year + \varepsilon_{it}
 \end{aligned}
 \tag{3}$$

### 3. Findings

#### 3.1 Descriptive Analysis

Table 4 shows that, due to the aging of companies in the Iranian capital market (with an average company age logarithm of 1.63) and the predominance of audits conducted by small audit firms (average 0.241), managers tend to be unfamiliar with new voluntary disclosure practices. Consequently, companies exhibit relatively low ESG performance, with an average score of 3.283.

**Table 4: Descriptive Statistics**

Variables	Mean	Median	SD	Kurtosis	Range	Min	Max
Df_EN_CON	40059.13	756.1	234082.8	104.899	2980399	2.121	2980402
ESG	3.283	3.324	0.712	2.587	3.27	1.593	4.863
Law	0.667	1	0.472	1.5	1	0	1
Q-Tobin	0.014	0.014	0.006	12.201	0.05	0.0001566	0.05
Loss	0.07	0	0.255	12.39	1	0	1
IO	1.096	0.69	5.439	134.124	64.25	0	64.25
BI	0.949	1	0.221	17.554	1	0	1
BD	0.009	0	0.041	20.796	0.2	0	0.2
AS	0.377	0	0.486	1.256	1	0	1
Size	0.241	0.269	0.06	2.901	0.318	0.001	0.319
SG	0.01	0.008	0.008	6.088	0.075	-0.021	0.054
Acid Test	0.012	0.006	0.032	144.054	0.454	6.322	0.454
LEV	0.071	0.014	0.769	267.218	12.919	-0.239	12.68
PROF	0.006	0.005	0.005	4.011	0.028	-0.007	0.021
AGE	1.634	1.663	0.141	2.825	0.705	1.146	1.851

Although the distribution of most companies' maximum ESG scores is right-skewed, reflecting a tendency toward higher values, pollutant consumption among Iranian companies remains notably high (International Energy Agency, 2021). Consequently, we anticipate that the average pollutant consumption within our target

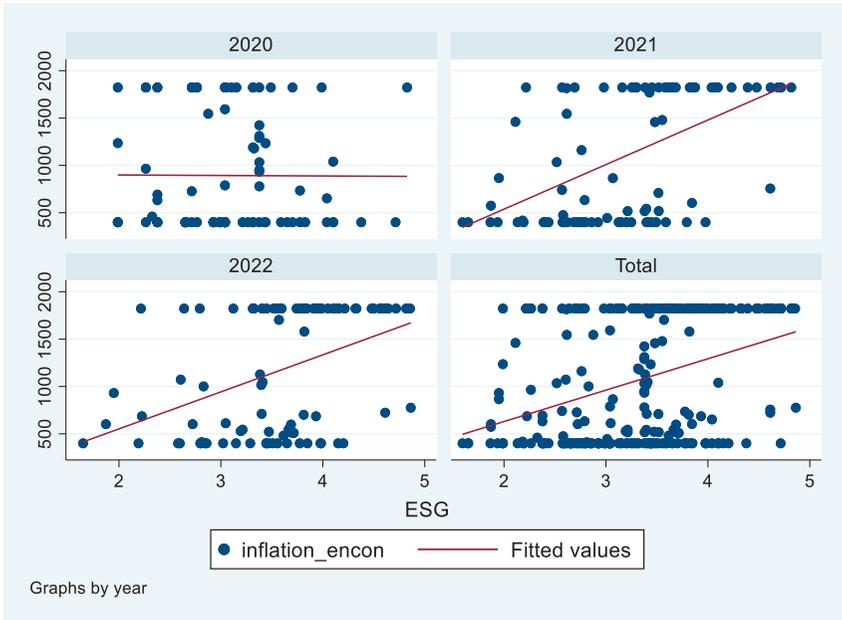
population will also be similarly elevated. This pattern suggests that the companies under study engage in greenwashing to enhance their power and competitiveness relative to peers. Such practices mitigate legitimacy, reputation, and litigation risks by artificially boosting corporate ESG performance. However, despite these efforts, they appear ineffective in reducing environmental pollutants. Therefore, based on the descriptive data, it is reasonable to expect that corporate ESG performance correlates with an increase in environmental pollutants, which is explicable through the lens of greenwashing.

Additionally, the Pearson correlation results in Table 5 reveal that, consistent with legitimacy theory’s greenwashing perspective, the Green Tax law, as a moderating variable, has a positive and significant effect (at the 0.95 confidence level) on the relationship between corporate ESG performance and environmental pollutants. This indicates that companies perceive the Green Tax law as more of a symbolic obligation than a substantive one. Their primary objective appears to be leveraging the law to enhance legitimacy and reduce litigation risk from regulatory bodies such as tax authorities. Furthermore, the results suggest that listed companies have mainly demonstrated desirable ESG performance to improve their market reputation. Thus, according to legitimacy theory (the greenwashing approach), strong corporate ESG performance not only fails to reduce environmental pollutants but may actually contribute to their increase. Data on pollutant consumption before and after the Green Tax law’s enactment show an upward linear trend. Although the data do not visually appear strictly linear, assuming linearity yields a higher R-squared value compared to non-linear models (Figure 2).

**Table 5: Pearson Correlation Test**

Variables	Pearson Correlation		
	EN_CON	ESG	Moderator of Law
Df_EN_CON	1.0000		
ESG	0.3631***	1.0000	
Moderator of Law	0.3015***	0.4937***	1.0000

Figure 2: Growth Trend of the ESG Performance



### 3.2 Inferential Statistics

Descriptive statistics indicate that environmental pollutants are increasing despite the legal framework established by governmental institutions. Meanwhile, corporate ESG performance scores are significantly higher than average relative to maximum reporting scores, suggesting that companies have adopted a greenwashing approach in their ESG disclosures. Given the observed linear relationship between corporate ESG performance and pollutant levels, the next step is to examine the impact of these variables through regression analysis. However, before proceeding, it is essential to verify the classical assumptions of regression.

Table 6 confirms the absence of multicollinearity among variables, indicating that the independent variables in the model are not highly correlated. Subsequently, a multiple regression model was fitted, incorporating year and industry while addressing heteroscedasticity and serial correlation. This approach ensures robust analysis of error terms across company performance from 2020 to 2022.

**Table 6: VIF Test**

Variables	VIF	
	First Model	Second Model
ESG	1.03	1.07
Law	-	1.16
Q-Tobin	1.53	1.54
Loss	1.15	1.16
IO	1.04	1.04
BI	1.04	1.04
BD	1.02	1.02
AS	1.23	1.23
Size	1.15	1.15
SG	1.02	1.08
Acid Test	1.08	1.08
LEV	1.02	1.03
PROF	1.40	1.41
AGE	1.05	1.05
Law ESG	-	1.09

According to Table 7, Equation (2) shows that the current model is sufficiently effective ( $F(27.9) = 0$ ) with an explanatory power of 0.52. At the 9 per cent significance level, corporate ESG performance has a positive and significant impact on environmental pollutants, with a 0.01 increase in ESG performance corresponding to a 180-unit rise in pollutant levels. Based on legitimacy theory and the greenwashing perspective, this suggests that companies often enhance their ESG performance primarily to gain credibility and improve their reputation rather than to achieve genuine environmental improvement. However, this strategy has led to increased ecological pollution, causing stakeholders to view such actions skeptically. These efforts are frequently seen as inconsistent with actual environmental conditions and indicative of greenwashing. Stakeholders believe these measures are aimed at retaining customers and maintaining favorable market positions in the short term, which could result in significant negative consequences for companies over the long term.

Based on Table 7, Equation (3) indicates that the model testing the second hypothesis is also effective ( $F(28.9) = 0$ ), with an explanatory power of 0.54. At the 95 per cent significance level, the enactment

of the Green Tax law has significantly increased environmental pollutants. Specifically, this law has amplified the effect of corporate ESG performance on pollutant levels by 293 units. This finding suggests that, despite the Green Tax law's intended purpose of reducing corporate environmental harm (Ioannou et al., 2022), it has had the opposite effect. According to legitimacy theory, such regulations can compel companies to increase transparency and adopt formal measures to enhance legitimacy and public credibility, thereby reducing litigation risks. However, companies, aware of regulatory gaps, often exploit these symbolic laws to protect their interests. They may superficially demonstrate positive ESG performance without implementing effective changes in corporate governance or addressing environmental and social issues in practice. Consequently, the Green Tax law, acting as a moderator, has contributed to a notable increase in environmental pollutants.

**Table 7: Summary of Hypothesis**

Variables	Coefficient		Robust std. error		t		P> t	
	Eq1	Eq 2	Eq1	Eq2	Eq1	Eq2	Eq1	Eq2
Cons	-267.536	363.657	681.013	652.327	-0.39	0.56	0.696	0.579
ESG	180.454	-23.98	57.908	75.76	3.12	-0.32	0.002	0.752
Law	-	-793.73	-	360.069	-	-2.20	-	0.030
Law*ESG	-	293.27	-	108.19	-	2.71	-	0.008
Q-Tobin	776.804	-80.728	6066.8	5969.51	0.13	-0.01	0.898	0.989
Loss	440.609	434.48	145.459	145.7	3.03	2.98	0.003	0.004
IO	-5.223	-6.101	4.294	4.394	-1.29	-1.39	0.199	0.168
BI	42.92	36.33	42.92	103.689	0.38	0.35	0.703	0.727
BD	-497.784	-360.45	610.85	595.604	-0.81	-0.61	0.417	0.547
AS	93.765	72.403	112.785	113.098	0.83	0.64	0.408	0.524
Size	2697.573	2815.8	1333.87	1290.83	2.02	2.18	0.046	0.032
SG	-4097.448	-4098.1	5418.18	5307.2	-0.76	-0.77	0.451	0.442
Acid Test	-691.306	-440.85	728.523	723.297	-0.95	-0.61	0.345	0.544
LEV	46.575	48.868	20.386	20.785	2.28	2.35	0.025	0.021
PROF	-5586.384	-4899.5	8457.589	8423.196	-0.66	-0.58	0.511	0.562
AGE	-355.683	-366.8	375.422	362.169	-0.95	-1.01	0.346	0.314
			<b>Eq1</b>				<b>Eq 2</b>	
R <sup>2</sup>			0.521				0.536	
F (26.91)			0				0	
Prob>F			0				0	
Confidence Interval = 0.95			Reject Hypothesis = ✗				Accept Hypothesis = ✓	
Hypothesis 1								✓
Hypothesis 2								✓

### 3.3 Robust Statistical Test

To further validate the findings, the second hypothesis was re-examined using a difference of means test to assess the significance of the changes in pollution levels before and after the Green Tax law's enactment. Pollution levels were standardized by dividing by total sales. Table 8 shows that despite the law's emphasis on reducing environmental pollutants, companies continued on an upward trajectory, experiencing a significant increase in pollution compared to 2020. This suggests that the Green Tax law either failed to incentivise emissions or that companies found ways to circumvent the regulations. These results align with the descriptive and inferential statistics presented earlier, reinforcing the conclusion that the Green Tax law has not succeeded in achieving its environmental objectives.

Table 8: T-test

Group	Obs	Mean	Std. errors	Std. dev.
No Green Taxation Law (one year)	91	0.013	0.0022	0.2155
Existing Green Taxation Law (two years)	182y	0.0253	0.0032	0.0434
Combined	273	0.0212	0.023	0.038
Diff	0.0039	-0.0122	0.0039	Diff

**Ha: df! = 0**

---

Pr (|T| > |t|) = 0.0021

## 4. Discussion

The challenges associated with ESG issues are particularly significant for companies in Asian countries such as Iran, Pakistan, India, Malaysia, and China (Suttipun & Dechthanabodin, 2022; Luo & Tang, 2023; Sujatha & Maheswari, 2023; Taghizadeh et al., 2023). In these countries, industries strive to justify both their financial and non-financial performance to enhance corporate reputation. They attempt to achieve this by showcasing positive ESG performance in their reports, which can help mitigate the risk of lawsuits and regulatory scrutiny. As a result, it is critical to examine the role of regulations and legal frameworks as moderating variables in the relationship between ESG performance and environmental pollution. Understandingly, this interaction reveals how regulatory environments shape the effectiveness of ESG practices and their environmental impact, ultimately guiding policymakers and

corporate leaders toward more sustainable and impactful initiatives from a stakeholder theory perspective.

This study explores the impact of ESG performance on environmental pollutants and finds a significant positive relationship between the two. In other words, higher ESG performance is paradoxically associated with increased levels of environmental contaminants within corporations. This counterintuitive result suggests that improved ESG performance does not necessarily translate into better environmental outcomes. The research further indicates that greenwashing, where companies exaggerate or falsify their ESG achievements, is often used by publicly traded firms to maintain legitimacy and shape stakeholder perceptions, rather than to deliver genuine environmental improvements. Such practices can increase public awareness of insincere environmental efforts, potentially leading to economic consequences for these companies, including bankruptcy and operational disruptions. These findings align with previous studies by De Jong et al. (2018), Gunawan et al. (2023), and Pears et al. (2023).

The study also investigates the moderating effect of Green Tax laws on the relationship between ESG performance and environmental pollutants. The results suggest that, in practice, these laws are often used as strategic tools to legitimise corporate behavior rather than to drive substantive environmental change. This approach leads to a short-term reduction of legitimacy risks, enhances corporate reputation, and mitigates litigation risks. While the introduction of Green Tax laws has prompted companies to increase their ESG reporting, these efforts are frequently superficial, aimed primarily at reducing litigation risks and environmental penalties. Consequently, such measures may inadvertently lead to higher levels of pollution, as companies focus on appearances rather than actual improvements. This highlights a tendency among corporations to pursue market legitimacy through enhanced ESG disclosures, temporarily misleading public opinion about their true environmental impact.

The research underscores the urgent need for robust regulatory frameworks that ensure authentic adherence to ESG principles, rather than mere compliance. Policymakers are encouraged to design regulations that compel companies to adopt genuinely sustainable practices, supported by stringent monitoring and reporting requirements that emphasise real reductions in environmental impact. Additionally, the study highlights the importance of transparency in ESG reporting, as greater openness can help deter greenwashing and make it more difficult for companies to mislead stakeholders about their environmental performance.

Stakeholder engagement is also identified as a key factor in improving ESG performance. By involving investors, customers, and local communities in the ESG evaluation process, companies can be held accountable for their environmental impact. Such engagement fosters a culture of sustainability within the organisation, driving long-term improvements in ESG performance (Ferrell et al., 2016).

Moreover, the research emphasises the critical role of corporate governance in ensuring the effectiveness of ESG initiatives. Strong governance structures, such as dedicated ESG committees within the board of directors and the integration of ESG metrics into executive compensation, provide essential oversight and accountability (Chiu, 2022).

The findings illuminate the complex interplay of economic incentives in promoting sustainability within Iran's environmental policy landscape. While mechanisms like renewable energy subsidies have achieved moderate success, persistent institutional and socioeconomic barriers remain. This mirrors broader trends in developing economies, where the effectiveness of market-based instruments depends on contextual adaptations (Hosseini & Kaneko, 2013). A closer examination of "green taxes" – intended to internalise environmental costs by taxing polluting activities – reveals their limited impact in Iran, despite their theoretical promise (Moosavian et al., 2022). Although such taxes have driven significant emission reductions globally, their implementation in Iran, as seen in the 2010 Targeted Subsidies Reform and the Sixth Five-Year Development Plan, has produced only marginal results, with green tax revenues accounting for less than 1 per cent of fiscal inflows and minimal pollution abatement (Farzanegan & Habibpour, 2017).

Comparisons with peer economies highlight the extent of this gap. For example, India and Brazil, despite facing similar challenges such as subsidy legacies and inflationary pressures, have achieved much higher green tax revenues, approximately 5 per cent and 3 per cent of fiscal inflows, respectively (Sternier, 2003). This contrast underscores the importance of economic context and policy design, reinforcing the need for adaptive reforms in Iran.

The underperformance of green taxes as sustainability promoters in Iran stems from a complex interplay of economic, political, and sociocultural challenges. High inflation, international sanctions, and a large informal sector undermine enforcement efforts and exacerbate the regressive impact of these taxes on vulnerable populations, often without adequate compensatory measures (Balali et al., 2024). Politically, inconsistent enforcement, bureaucratic obstacles, and

strong industry lobbying, combined with low transparency, reflect broader weaknesses in Iran's environmental governance (Madani et al., 2016). Socioculturally, limited public awareness further hampers change, as surveys indicate that sustainability remains a low priority for many Iranians (Azadi et al., 2012). To address these challenges, integrating green taxes with targeted incentives, such as credits for adopting technologies, and enhancing monitoring through digital innovations could significantly increase their effectiveness. By framing these policies as choice-architecture nudges, policymakers can subtly guide behavior, drawing on proven international successes in promoting sustainable decisions. This approach aligns with our study's emphasis on hybrid strategies (Panbechi et al., 2025) and could help Iran advance toward its Paris Agreement commitments. Ultimately, these insights caution against uncritical adoption of green taxes and advocate for adaptive reforms tailored to Iran's unique context to unlock their full potential.

Consequently, the ESG challenges faced by companies in Asian countries demand a multifaceted response that includes strong regulatory frameworks, transparent reporting, active stakeholder engagement, and robust corporate governance. Addressing these areas enables companies to genuinely improve ESG performance, reduce environmental pollutants, and strengthen their reputations. This study offers valuable insights into the complex relationships among ESG performance, regulatory environments, and ecological outcomes, providing a roadmap for policymakers and corporate leaders to implement sustainable and effective ESG initiatives. Moreover, these efforts promote corporate accountability for environmental impacts, fostering more sustainable business practices across the region.

## **5. Conclusion**

The research findings reveal that Hypothesis 1 is supported by a significant positive relationship between ESG performance and environmental pollutants. This means that as corporations report higher ESG performance, their emissions of environmental pollutants do not necessarily decrease; in fact, pollution levels may remain high or even increase. This unexpected result suggests that companies might be improving their ESG scores through superficial or symbolic actions rather than making substantive environmental improvements. It highlights the complexity and potential pitfalls of relying solely on ESG performance as an indicator of a company's true environmental impact.

Hypothesis 2 demonstrates that Green Tax laws moderate the relationship between ESG performance and environmental pollutants. Specifically, green tax policies can either strengthen or weaken the influence of ESG performance on pollution levels, depending on how effectively these policies are designed and enforced. Effectively designed and rigorously enforced green tax policies can drive meaningful environmental progress by encouraging companies to adopt sustainable practices. In contrast, poorly structured or weakly enforced policies allow companies to maintain pollution levels while superficially enhancing their ESG disclosures.

This study also contributes to the development of legitimacy theory by highlighting the prevalence of greenwashing among pollutant-emitting firms in Iran and international markets. Firms often overstate their ESG achievements to bolster legitimacy and reputation despite ongoing environmentally harmful practices and weak governance. As public awareness of these deceptive practices grows, such behavior is increasingly recognized as greenwashing (Mu & Lee, 2023). Greenwashing is the deceptive practice of making false or misleading claims about a company's environmental practices or the environmental benefits of a product or service (Wang et al., 2023). Essentially, it is a tactic used to appear more environmentally friendly than the company actually is, misleading consumers, investors, and other stakeholders about the true environmental impact of their operations.

However, like other empirical studies focused on specific contexts, the generalizability of these findings is limited. The results apply only to companies meeting the study's criteria and to the relatively short period during which carbon reporting and pollutant disclosures have been mandatory in Iran. Future research covering longer time frames and a broader range of companies would enhance the applicability of these findings across different contexts and provide deeper insights into long-term trends in ESG performance and greenwashing.

The study's results have important implications for policymakers and government officials. Given the widespread issue of greenwashing among publicly traded companies, innovative legislation is needed to combat climate change effectively. Such policies should encourage the adoption of renewable energy and green technologies. Additionally, corporations should invest in educating employees about the long-term consequences of environmental pollution. Building a culture of sustainability within organizations can drive meaningful environmental improvements

and reduce their reliance on superficial ESG enhancements (Daugaard, 2020).

Encouraging whistleblowers and exposing corporations engaged in greenwashing can significantly enhance accountability through legal actions, ultimately contributing to a reduction in pollution levels nationwide. Governments play a vital role in adopting and reinforcing necessary regulations, such as green levies, to promote environmental sustainability (Geels, 2014). Therefore, it is recommended that governments allocate dedicated resources to strengthen the knowledge and capabilities of environmental inspectors. These inspectors must be well-equipped to continuously monitor corporate activities and take decisive action against firms involved in greenwashing. By bolstering enforcement mechanisms and providing sufficient resources for oversight, governments can ensure companies are held accountable for their environmental claims and practices, thereby fostering good governance.

Environmentalists and investors are urged to remain vigilant about greenwashing (Richardson, 2019). It is essential not only to celebrate genuine positive ESG performance but also to actively expose companies that engage in deceptive practices through various media channels. By withholding financial support from such corporations in the stock market, stakeholders can raise public awareness about the harmful environmental and societal consequences of greenwashing. This concerted effort has the potential to substantially reduce greenwashing over time. Leveraging their influence and resources, environmental advocates and investors can drive greater transparency and accountability in corporate environmental practices.

Collaboration with international organisations can further strengthen efforts to combat greenwashing globally (Baratta et al., 2023). Such partnerships provide a unified front and shared resources, enabling more effective responses to this challenge. International cooperation can promote best practices and establish standardised strategies for detecting and preventing greenwashing. By exchanging knowledge and resources across borders, countries can develop more robust and practical frameworks for regulating and monitoring corporate environmental claims.

Additionally, scholars should investigate specific factors that influence ESG performance to deepen understanding of its complexities. Research topics such as gender dynamics in organisational structures, the varying effectiveness of green technologies, the impact of institutional ownership, and the role

and characteristics of audit committees are particularly promising. Exploring these areas can reveal key drivers and obstacles to effective ESG practices, enabling targeted recommendations to improve corporate environmental performance.

The research highlights the importance of a diverse approach to combating greenwashing, combining legislative measures, corporate initiatives, and public awareness campaigns. Policymakers should consider implementing stringent regulations that mandate transparent reporting of ESG performance and environmental impacts. Such rules could require detailed disclosures of CO<sub>2</sub> emissions, waste management practices, and renewable energy usage (Lee & Lee, 2018). Enforcing these standards will hold businesses accountable for their environmental footprint and help curb greenwashing.

Moreover, corporations should prioritise developing strategies aimed at genuinely improving ESG performance. This includes adopting energy-efficient technologies, minimising waste, and implementing sustainable resource management throughout supply chains. Employee training programs and workshops can raise awareness about ESG goals and the benefits of sustainable practices. Cultivating a sustainability-focused culture within organisations enables tangible improvements in ESG outcomes and reduces negative environmental impacts.

Raising public awareness is another crucial tool in the fight against greenwashing. Educating consumers about the tactics companies use to feign environmental responsibility can generate authentic pressure for change. Investigative journalism plays a pivotal role by uncovering instances of greenwashing, while social media platforms amplify these revelations and mobilise public opposition. Awareness campaigns can emphasise the importance of supporting genuinely sustainable businesses and encourage consumers to make informed choices that align with their environmental values.

However, these measures alone are insufficient to fully address greenwashing. International cooperation is increasingly essential to tackle these globally interconnected issues. Global institutions can develop unified ESG reporting standards and environmental regulations, reducing opportunities for companies to exploit regulatory discrepancies across jurisdictions. International forums and conferences facilitate knowledge sharing and coordinated action. By fostering global dialogue on ESG practices and greenwashing, countries can collaborate to create more consistent and effective regulatory frameworks.

Finally, ongoing research into ESG performance and greenwashing remains crucial due to the evolving nature of these issues. Future academic work should examine how firm-specific characteristics affect ESG outcomes and evaluate the effectiveness of current regulations and corporate initiatives against greenwashing. Comprehensive literature reviews analyzing long-term trends in ESG performance and environmental impacts can provide deeper insights. Integrating perspectives from economics, environmental science, sociology, and business studies will enhance understanding of the complex interrelations involved.

In summary, this study emphasizes the urgent need to intensify efforts against greenwashing in corporate management. Collaborative approaches are vital for developing innovative policies, strengthening corporate strategies, raising public awareness, and fostering robust international cooperation. These combined efforts can reduce greenwashing, promote authentic environmental responsibility, and improve governance. Further research should focus on dissecting ESG components and exploring strategies to mitigate greenwashing's effects, supported by legislation and partnerships among corporations, governments, and civil society. By addressing the root causes of greenwashing and encouraging genuine sustainability, we can advance towards a more transparent and environmentally responsible corporate landscape.

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## **Endnotes**

- <sup>1</sup> Codal.ir is the official information disclosure platform for Iran's capital market, regulated by the Securities and Exchange Organization.
- <sup>2</sup> For more information, visit <https://rdis.seo.ir/fa/category/list/22/annual-reports>

- <sup>3</sup> According to Iranian regulations, shareholders with ownership stakes greater than 0.05 are classified as institutional shareholders.
- <sup>4</sup> Due to the absence of the four major international auditing firms in Iran, the Audit Organization and Mofid Rahbar are regarded as the two largest auditing institutions compared to the others, which are typically considered the primary large-scale auditors in the classification of auditing institutions in Iran.
- <sup>5</sup> [https://cbi.ir/default\\_en.aspx](https://cbi.ir/default_en.aspx)

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