

**ESG DISCLOSURE, MEDIA EXPOSURE, AND SALES GROWTH
IN INDONESIAN MINING AND ENERGY**



Thesis by:

Surya Auladiansyah Prias (22111014)

Thesis Supervisor:

Dety Nurfadilah, S.E., MBA

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**ESG DISCLOSURE, MEDIA EXPOSURE, AND SALES GROWTH
IN INDONESIAN MINING AND ENERGY**

Prepared by:

Surya Auladiansyah Prias (22111014)

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CERTIFICATE OF APPROVAL

Name & Student ID: Surya Auladiansyah Prias (22111014)

Topic:

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INDONESIAN MINING AND ENERGY

We hereby declare that this Thesis is from student's own work, has been read and presented to Institute IPMI Board of Examiners, and has been accepted as part of the requirements needed to obtain a Bachelor of Business Administration Degree and has been found to be satisfactory.

Jakarta, 20 August 2026

Examined by,



Dety Nurfadilah, B.IfB, MBA
(Thesis Supervisor)



Dr. Liza Agustina
Maureen Nelloh, SE.,
MM., CDM
(Chief of Examiner)



Ir. Sasotya
Pratama, M.T.E
(Examiner)

Acknowledged by,



Prof. Dr. Christina Whidya Utami MM., CLC., CPM (A).
Director of Academic & Student Affairs

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This Thesis is a presentation of our original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

Also, this work is being submitted in partial fulfillment of the requirements for the Bachelor of Business Administration degree and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Jakarta, 20 August 2026



(Surya Auladiansyah Prias)

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ABSTRACT

Indonesia's energy and mining sector plays a central role in national economic growth as one of the world's largest coal and nickel exporters, yet it faces mounting pressure to operate more responsibly. Policies such as POJK No. 51/POJK.03/2017 have pushed ESG disclosure toward becoming standard practice, but whether this disclosure translates into commercial results remains largely untested, as prior research has focused mainly on firm value or profitability.

This study tests how Environmental (E), Social (S), and Governance (G) disclosure relate to sales growth among Indonesian energy and mining companies listed on the IDX, examining media exposure as a possible mediator. This study is anchored in Signaling Theory, with Stakeholder Theory and Legitimacy Theory providing supporting explanations for why firms disclose. The empirical work draws on panel data from 25 listed companies covering the 2021–2025 window, amounting to 125 firm-year observations. ESG scores were built through GRI-based content analysis of annual and sustainability reports, media exposure was captured as the log of ESG-related news coverage, and sales growth was defined as year-on-year revenue change after winsorizing extreme values. To estimate the model, panel regression with clustered standard errors was combined with both Sobel and bootstrap procedures for testing mediation.

ESG disclosure in this sector only boosted media coverage especially for Social and Governance issues, not Environmental. But that coverage didn't lift sales. And sales weren't directly affected by any disclosure type either. So despite drawing attention, ESG messaging seemed to fall flat in this B2B, price-sensitive market unlike what previous consumer-goods studies found. That gap matters for how companies frame ESG, handle media, and shape policy.

Keywords: ESG disclosure, media exposure, sales growth, mediation, energy and mining, Indonesia

CHAPTER I

INTRODUCTION

1.1 Research Background

Environmental, Social, and Governance (ESG) issues have moved from the periphery of corporate reporting to the center of how companies communicate with the market. What began, in the early 2000s, as a voluntary sustainability disclosure practice has become, particularly after the 2008 global financial crisis, a global expectation that firms account not only for their financial results but for their environmental footprint, their treatment of people, and the quality of their governance (Fatemi et al., 2018; Friede et al., 2015). Global ESG-related assets under management are projected to exceed USD 50 trillion by the mid-2020s, underscoring that ESG has moved well beyond a niche concern for socially conscious investors into a mainstream expectation shaping corporate strategy (Tran & Pham, 2022).

This study is built primarily on the framework of Tran and Pham (2022), *“How Does Environmental, Social, and Governance Disclosure Promote Sales? Empirical Evidence from Global Firms.”* Tran and Pham’s study, drawing on legitimacy theory, argues that ESG disclosure functions as a communication strategy: when a firm discloses its environmental, social, and governance practices, it signals legitimacy to its stakeholders. In business-to-consumer settings this reputational signal can plausibly extend to customers’ purchasing decisions, but the customer base of Indonesian energy and mining issuers coal, nickel, and other mineral buyers is overwhelmingly industrial rather than retail. Sales in this sector are shaped primarily by commodity prices, production volume, long-term offtake and export contracts, exchange rates, global commodity demand, government policy, production capacity, and buyer procurement standards, none of which are captured in this study. It is therefore important to distinguish two distinct outcome pathways that ESG disclosure may generate: an ESG disclosure → stakeholder/reputation outcome, in which disclosure shapes how a firm is perceived by regulators, investors, communities, and the media; and an ESG disclosure → commercial/sales outcome, in which that perception translates into

revenue. The present study focuses on the first pathway as it is carried by media coverage, and treats the link to commercial outcomes as theoretically plausible rather than empirically demonstrated in a business-to-business mining and energy context, where buyers are professional counterparties rather than ordinary retail consumers. Using a global panel of 826 firms spanning the 2008 financial crisis, Tran and Pham find that overall ESG disclosure, and Social disclosure in particular, has a significant positive effect on sales performance, and that this effect is considerably more pronounced during periods of market turbulence, when public trust becomes scarce and firms that can visibly demonstrate responsibility are rewarded with stronger customer support. This study adopts Tran and Pham's central proposition that ESG disclosure is, first and foremost, a market-facing communication strategy capable of promoting sales as its primary theoretical anchor, and extends it into a sector and a mechanism that Tran and Pham's global-firm sample did not specifically examine: Indonesian energy and mining companies, and the role of media coverage in carrying the ESG signal from the company to the market.

ESG disclosure alone, however, does not automatically reach the public. A sustainability report is, by design, a technical document read mainly by analysts, regulators, and specialized investors. For an ESG signal to influence ordinary customers and business partners, it typically needs to be picked up, simplified, and disseminated by independent news media. This is the logic behind treating Media Exposure as the mechanism the mediating variable through which ESG disclosure translates into sales growth: companies that disclose more information on their environmental, social, and governance practices are more likely to attract media coverage of those practices, and it is this media coverage, rather than the disclosure document itself, that reaches stakeholders including, but not confined to, the professional buyers, regulators, and communities that make up this sector's stakeholder base.

At the same time, the credibility of this pathway is not guaranteed. The risk that ESG disclosure diverges from actual corporate practice commonly known as greenwashing threatens to break the very mechanism this study proposes. Lee and

Raschke (2023) define greenwashing as a firm's attempt to project an image of environmental and social responsibility without a corresponding commitment to substantive ESG practice, typically through the overstatement or selective reporting of sustainability information; they argue that such practices create a legitimacy gap that, once exposed, undermines rather than builds stakeholder trust. The most instructive real-world illustration of this risk is the Volkswagen "Dieselgate" scandal. Between 2009 and 2015, Volkswagen installed defeat-device software in roughly eleven million diesel vehicles worldwide, engineered to detect laboratory emissions testing and activate pollution controls only during the test, while the same vehicles emitted nitrogen oxide at up to forty times the legal limit under normal driving conditions (U.S. Department of Justice, 2016). During the same period, Volkswagen had marketed its "Clean Diesel" line as an environmentally responsible alternative to gasoline engines, and subsequent content analysis of the company's 2012–2014 CSR reports alongside more than a thousand U.S. news headlines has shown that Volkswagen's sustainability communication diverged sharply from its actual environmental conduct a pattern researchers classify as a distinctive, deliberate form of greenwashing (Siano, Vollero, Conte, & Amabile, 2017). Once independent parties the U.S. Environmental Protection Agency, the International Council on Clean Transportation, and subsequently the global press exposed this gap, media coverage did not amplify Volkswagen's sales; it triggered fines and settlements exceeding USD 30 billion, the resignation of its CEO, and years of reputational repair (U.S. Department of Justice, 2016; Kell, 2022). The Volkswagen case therefore illustrates precisely why Media Exposure is theorized here as a *mediator* rather than an automatic amplifier: media coverage only transmits a positive ESG signal to the market when that coverage is itself favorable, which in turn depends on whether the underlying disclosure reflects genuine practice rather than symbolic reporting (Lee & Raschke, 2023).

Within this broader global context, Indonesia's energy and mining sectors present a setting of particularly high ESG exposure. The sector is central to national economic growth Indonesia is among the world's largest coal exporters and holds substantial reserves of nickel, copper, and bauxite that are critical to global industrial

and electric-vehicle supply chains yet it is simultaneously the sector most frequently cited in Indonesia's Ministry of Environment and Forestry (KLHK) PROPER ratings as carrying the highest environmental risk, with energy and mining companies disproportionately represented among firms receiving Red and Black environmental-compliance ratings. The regulatory landscape has evolved accordingly: OJK Regulation Number 51/POJK.03/2017 on Sustainable Finance mandated sustainability reporting for listed companies, and Indonesia's 2022 commitment to the Just Energy Transition Partnership (JETP) at the G20 Bali Summit further elevated the urgency of credible ESG communication in this sector. Against this backdrop of high scrutiny and high greenwashing risk, understanding whether and through what mechanism ESG disclosure actually promotes commercial performance in Indonesian energy and mining companies is both theoretically and practically important.

1.2 Problem Statement

Most existing research on ESG disclosure in Indonesia's energy and mining sector has examined its relationship with firm value, profitability, or broader financial performance, with decidedly mixed results. Comparatively little research has asked the more commercially direct question posed by Tran and Pham (2022): does ESG disclosure actually help a company sell more? This gap is especially pronounced for Indonesian energy and mining companies, whose products (coal, gas, and minerals) are frequently sold to industrial and institutional buyers who are themselves under growing pressure to demonstrate responsible sourcing, making the sector a plausible setting for ESG disclosure to matter commercially.

Beyond just looking at whether ESG affects sales, there's a bigger blind spot: how that actually happens. Even studies that find a positive link rarely explain the step-by-step process like how a PDF on a company website ends up changing customer behavior. We propose media coverage as the missing bridge. Disclosure has to get picked up by the press first; only then can it influence how the market sees and responds to a company. Without testing that middle step, earlier research whether it found a positive effect or not doesn't really tell us why the link exists or falls apart.

But we shouldn't assume this chain always works in the company's favor. Volkswagen's greenwashing scandal is a good cautionary tale. And in Indonesia's energy and mining sector, where PROPER compliance has historically been spotty, some ESG reports might be more about image than real action. If that's the case, media exposure could end up spreading bad press instead of good. So for the 2021–2025 period, we're asking three things: does ESG disclosure boost sales, does it attract media coverage, and does that coverage actually translate into sales growth?

1.3 Research Questions

1. Does Environmental disclosure (E) positively influence sales growth?
2. Does Social disclosure (S) positively influence sales growth?
3. Does Governance disclosure (G) positively influence sales growth?
4. Does Environmental disclosure (E) positively influence media exposure?
5. Does Social disclosure (S) positively influence media exposure?
6. Does Governance disclosure (G) positively influence media exposure?
7. Does media exposure positively influence sales growth?

1.4 Research Objectives

1. To analyze the influence of Environmental disclosure on sales growth of energy and mining companies listed on the IDX during 2021–2025.
2. To analyze the influence of Social disclosure on sales growth of energy and mining companies listed on the IDX during 2021–2025.
3. To analyze the influence of Governance disclosure on sales growth of energy and mining companies listed on the IDX during 2021–2025.
4. To analyze the influence of Environmental disclosure on media exposure.
5. To analyze the influence of Social disclosure on media exposure.
6. To analyze the influence of Governance disclosure on media exposure.
7. To analyze the influence of media exposure on sales growth.

1.5 Research Benefits

1.5.1 Theoretical Contribution

We take the sales-focused framework from Tran and Pham (2022) and apply it somewhere previous studies have barely touched: Indonesia's energy and mining sector. This industry carries unusually high environmental and social risks. Instead of just checking whether ESG directly affects performance like most earlier work did we bring media coverage into the picture as the key middle step. This study explains how ESG disclosure may influence sales by examining the process through which such information creates commercial value rather than focusing only on whether an effect exists. The analysis integrates three theoretical perspectives to explain this process, with Signaling Theory providing the central foundation by viewing ESG disclosure as a signal that gains value when an independent channel receives and communicates it to the market. Stakeholder Theory complements this perspective by explaining firms' motivation to disclose ESG information as a response to the expectations of stakeholders who influence their activities and performance. Legitimacy Theory then clarifies how credible sustainability communication can strengthen public acceptance and maintain organizational legitimacy over time. The analysis also incorporates greenwashing research, particularly Lee and Raschke (2023), which emphasizes that the benefits generated by ESG disclosure depend heavily on the credibility of the information presented. The Volkswagen case demonstrates the consequences of weakened credibility because misleading sustainability claims can damage legitimacy and attract negative media attention while reducing or even eliminating the intended benefits of ESG disclosure.

1.5.2 Practical Contribution

For managers and communication teams in the energy and mining sectors, this study views ESG reporting and media outreach as interconnected activities that can strengthen the visibility and impact of sustainability efforts. Publishing a sustainability report alone rarely attracts sufficient attention or influences business outcomes unless credible media outlets recognize its value and communicate the findings to a wider audience. This study therefore emphasizes that companies need to consider not only

the substance of their ESG reporting but also the extent to which relevant stakeholders can access and respond to its content. For OJK as the regulatory authority, this study provides evidence to evaluate whether POJK No. 51/POJK.03/2017 has encouraged meaningful sustainability disclosure rather than simply increasing reporting obligations. The findings can also support future policy adjustments and provide a basis for evaluating the regulation's effectiveness over time.

For investors and analysts, we offer a tool to tell whether a company's ESG disclosure is genuinely gaining traction through media buzz and sales uplift or just ticking a compliance box. Paying attention to both the quality of the disclosure and how well it actually reaches the market can lead to smarter investment calls.

1.6 Scope of Research

This research investigates the effect of Environmental (E), Social (S), and Governance (G) disclosure on the sales growth of energy and mining companies listed on the Indonesia Stock Exchange (IDX) during the period 2021–2025, with media exposure examined as a mediating variable. The study uses a sample of 25 companies, yielding 125 firm-year observations.

CHAPTER II

LITERATURE REVIEW

2.1 Theoretical Foundation

2.1.1 Stakeholder Theory

Freeman (1984) introduced Stakeholder Theory, arguing that companies answer to more than just shareholders. They also have responsibilities toward employees, customers, suppliers, local communities, governments, and society as a whole. The core idea is simple: long-term success depends on a company's ability to deliver value and build strong relationships with all these groups by meeting their needs and expectations.

These days, stakeholders want to see more honesty from companies about their ESG performance. So ESG reporting has turned into a major channel for showing that a business actually cares about sustainability and taking responsibility. Get the reporting right, and you can earn trust, polish your image, and keep clients and other stakeholders on board for the long haul.

Two theories guide this work, but they play different roles. Stakeholder Theory gives us the rationale for why energy and mining firms feel compelled to publish ESG disclosures, while Signalling Theory (Section 2.1.2) serves as our main analytical framework for tracing how that information moves through the market and what impact it actually generates. Companies in these sectors face intense public and stakeholder scrutiny because their operations create substantial environmental and social consequences which require comprehensive reporting to maintain stakeholder confidence and preserve corporate credibility. Stakeholder theory suggests that favorable perceptions may strengthen corporate reputation and that a stronger reputation could contribute to improved sales performance yet this relationship requires careful interpretation within the context examined here. Unlike consumer markets where personal values can strongly influence individual purchasing choices the B2B commodity market places greater emphasis on price supply reliability and contractual

conditions which can limit the influence of reputation on buying decisions (Tran & Pham, 2022; Freeman, 1984).

2.1.2 Signaling Theory

This study adopts Signalling Theory as its primary theoretical framework. Spence (1973) introduced the theory to describe how informed parties can communicate credible signals that reduce information asymmetry with external parties. Within a corporate setting companies generally possess more detailed knowledge of their sustainability practices than investors customers and the wider public can directly observe. ESG disclosure can therefore function as a favorable signal of a firm's commitment to responsible and ethical business practices.

However a signal can only create value when its intended recipients actually receive and recognize the information rather than simply encountering a corporate disclosure. Media exposure provides this communication channel by distributing ESG information through established and credible news platforms. Independent media coverage can strengthen the credibility of corporate sustainability claims because stakeholders often consider third-party reporting more objective and less self-interested than information released directly by the company.

This study applies Signalling Theory to explain the relationship between ESG disclosure and media coverage by proposing that firms with more extensive sustainability reporting may receive greater media attention. Increased press coverage can expand the visibility of corporate sustainability activities while also reinforcing their credibility among stakeholders. Greater awareness of these practices may then improve stakeholder perceptions of the company and create conditions that support stronger sales performance (Spence, 1973; Zheng et al., 2022).

2.1.3 Legitimacy Theory

Legitimacy Theory proposed by Suchman (1995) explains that organisations need to align their activities with prevailing social values norms and expectations to gain and maintain legitimacy within society. Public acceptance becomes more attainable when corporate actions demonstrate appropriateness accountability and

consistency with societal expectations. ESG disclosure has consequently become an important mechanism through which firms communicate their environmental social and governance commitments while reinforcing their credibility.

The role of legitimacy becomes more critical in industries that generate substantial environmental and social impacts such as energy and mining. Firms operating in these sectors face greater public scrutiny and need to demonstrate responsible conduct through transparent sustainability reporting. However credibility depends on whether ESG disclosures accurately reflect actual corporate practices. When firms exaggerate or misrepresent sustainability achievements stakeholders may interpret such communication as greenwashing which can damage corporate reputation and weaken public trust.

This research applies Legitimacy Theory to examine how credible ESG disclosure influences corporate reputation and stakeholder acceptance. The Volkswagen Dieselgate scandal illustrates how misleading sustainability claims can generate negative media attention reduce corporate credibility and weaken stakeholder trust despite extensive ESG communication efforts (Lee & Raschke, 2023). Firms therefore need to ensure that sustainability disclosures represent genuine achievements rather than symbolic compliance. Maintaining legitimacy through credible ESG practices and favourable media exposure may strengthen stakeholder confidence and support sustainable sales growth.

2.2 ESG Disclosure

2.2.1 Concept and Measurement Frameworks

ESG disclosure is a company's formal reporting of its environmental, social and governance performance, including policies, initiatives, risks and management practices relevant to sustainable business operations. This information is generally included in Sustainability Reports, Annual Reports, or other official corporate disclosures to give stakeholders transparent and credible information on the company's sustainability performance. As ESG issues become more relevant in corporate decision-making, ESG disclosure is not only a regulatory requirement but also a

strategic communication tool that helps companies demonstrate accountability, strengthen stakeholder trust, and enhance corporate reputation (GRI Standards, 2021).

The implementation of ESG disclosure in Indonesia has received more attention after the issuance of Financial Services Authority Regulation (POJK) No. 51/POJK.03/2017, which requires financial institutions, listed companies and public companies to prepare Sustainability Reports as part of their commitment to sustainable finance (OJK, 2017). The rule does not impose a particular reporting methodology, however many Indonesian corporations choose to use the Global Reporting Initiative (GRI) Standards, which are well recognised internationally as offering comprehensive and standardised principles for sustainability disclosure. The GRI framework offers enterprises a consistent method to report their environmental, social and governance activities, enhancing the comparability and trustworthiness of sustainability information across companies (GRI Standards, 2021).

Following Tran and Pham (2022), this study classifies ESG disclosure into three separate dimensions namely environmental social and governance rather than combining them into a single overall measure. Separating these components allows the analysis to identify the individual contribution of each dimension to media coverage and sales performance without allowing strong disclosure in one area to obscure weaker disclosure in another. This study measures each dimension through a GRI-based content analysis checklist that applies a binary scoring approach where each disclosed item receives a score of 1 while an undisclosed item receives 0. The study then sums the scores for each category to construct three independent indices covering Environmental disclosure Social disclosure and Governance disclosure.

2.2.2 Environmental Disclosure (E)

Environmental disclosure refers to the communication of information concerning a firm's environmental performance policies and management practices that seek to reduce the ecological effects of its business activities. This form of reporting holds particular importance for energy and mining firms because their operations involve substantial natural resource consumption greenhouse gas emissions water utilization waste generation and biodiversity concerns. Transparent

environmental reporting enables stakeholders to assess how effectively a company fulfils its environmental responsibilities and complies with sustainability regulations and internationally recognised reporting standards (Buallay et al., 2023).

Legitimacy Theory provides a relevant perspective for explaining environmental disclosure because the theory suggests that firms communicate environmental information to reduce the perceived difference between their actual ecological performance and societal expectations (Deegan, 2002; Cormier & Magnan, 2007). This function becomes especially relevant for extractive firms because their continued operations rely heavily on acceptance from local communities and regulatory authorities. Environmental reporting therefore operates as a legitimacy management mechanism that demonstrates corporate awareness of environmental risks and shows how the organisation manages those risks throughout resource extraction activities.

Voluntary disclosure theory offers a complementary explanation for why disclosure levels vary across firms. Clarkson et al. (2008) argue that environmentally superior performers have a stronger incentive to disclose discretionary environmental information because doing so allows them to differentiate themselves credibly from poorer performers, who would find such disclosure too costly to imitate. Hummel and Schlick (2016) emphasise that the volume of disclosure does not necessarily indicate higher reporting quality or stronger environmental performance and this distinction remains important for the discussion of disclosure credibility presented in Section 2.4.3 of this research. In Indonesia environmental reporting also operates within the framework of the Ministry of Environment and Forestry's Corporate Performance Rating Programme known as PROPER which evaluates and publicly ranks corporate environmental compliance from Gold to Black (KLHK, 2023). Energy and mining firms frequently appear among companies with the lowest PROPER ratings which increases the relevance of voluntary environmental reporting as a means for individual firms to demonstrate responsible environmental practices and separate their performance from the sector's broader reputation for weak compliance.

2.2.3 Social Disclosure (S)

Social disclosure represents the communication of corporate policies initiatives and performance concerning employees customers local communities and other stakeholders affected by business operations. Effective reporting in this area demonstrates a firm's commitment to fair employment practices occupational health and safety diversity community involvement and human rights. Such information can strengthen stakeholder trust enhance corporate reputation and contribute to long-term organisational sustainability.

The theoretical foundation of social disclosure draws primarily from Freeman's (1984) Stakeholder Theory and the social contract perspective developed by Gray Kouhy and Lavers (1995). Stakeholder Theory establishes that corporate accountability extends beyond shareholders to include employees communities customers and other groups influenced by organisational activities. The social contract perspective views a firm's continued operation as dependent on an implicit agreement with society that requires acceptable corporate behaviour. Social disclosure allows firms to demonstrate compliance with these expectations by communicating their responsibilities toward employees surrounding communities and customers who maintain direct connections with business activities.

Previous studies provide empirical support for this perspective across several areas. Turban and Greening (1997) show that social performance and related disclosure can affect organisational attractiveness as an employer which indicates that its influence reaches labour markets beyond general corporate reputation. Tran and Pham (2022) provide evidence that Social disclosure has a significant association with sales growth that differs from the effects observed for Environmental and Governance dimensions and this association becomes stronger during periods of market pressure when public confidence declines. This evidence provides a basis for assigning greater analytical attention to Social disclosure within the present research framework.

Social disclosure also holds particular relevance for Indonesia's energy and mining sector because many firms depend on large workforces and operate near communities that experience direct effects from extraction and energy activities. This

operational proximity increases the importance of communication for stakeholders who face the greatest exposure to corporate impacts. Workplace safety represents a major concern because extraction and heavy machinery involve substantial physical risks which makes transparent reporting on occupational safety and community relationships a meaningful indicator of corporate social responsibility.

2.2.4 Governance Disclosure (G)

Governance disclosure describes the transparency of a firm's governance structure ethical conduct accountability arrangements and internal monitoring processes that support responsible and sustainable management. Effective governance strengthens stakeholder confidence by showing that corporate sustainability commitments receive support from capable leadership strong internal controls ethical principles and systematic risk management.

Agency Theory developed by Jensen and Meckling (1976) provides a central explanation for the relevance of governance disclosure because the separation between ownership and management can create opportunities for managers to pursue personal interests rather than the objectives of shareholders and other stakeholders. Information concerning board composition monitoring arrangements and anti-corruption measures can reduce this agency gap by allowing external parties to assess whether management operates under adequate oversight (La Porta et al., 2000). The OECD Principles of Corporate Governance reinforce this perspective by identifying transparency and disclosure as essential elements of effective governance because shareholders require timely and relevant information to monitor management and exercise their rights (OECD, 2015). Cross-country evidence from Choi Chung and Young (2023) further indicates that greater transparency is associated with stronger firm performance which suggests that governance disclosure can strengthen stakeholder confidence rather than merely satisfy formal reporting requirements.

Governance transparency carries particular significance within the energy and mining sector because extraction rights licensing arrangements and payments to governments can create opportunities for corrupt practices. These risks have encouraged international initiatives such as the Extractive Industries Transparency

Initiative which promotes greater disclosure of payments and governance practices across extractive industries. Indonesia addresses similar concerns through Good Corporate Governance guidelines developed by OJK and the National Committee on Governance Policy (KNKG). This research incorporates both frameworks when developing the governance disclosure checklist to assess the transparency of governance practices within the sector.

2.3 Sales Growth

Sales Growth measures the annual percentage change in a firm's total sales revenue and provides a widely used indicator for evaluating changes in market performance over time (Nyame-Asiamah & Ghulam, 2019). As a common measure of business performance, this indicator captures the firm's ability to attract buyers expand market demand and maintain its competitive position (Zhang et al., 2020). Unlike valuation measures that mainly reflect investor expectations about future prospects, Sales Growth captures an operational result that directly represents customer purchasing behaviour and the market response to a firm's products or services (Tran & Pham, 2022).

This study adopts Sales Growth as the dependent variable based on the sales performance framework developed by Tran and Pham (2022). While their research evaluates performance through total sales revenue, the present study measures the annual growth rate of revenue to capture changes in commercial performance across periods. This measurement enables the analysis to determine whether stronger ESG disclosure corresponds with increasing customer demand and business expansion rather than merely indicating differences in organisational scale (Dai et al., 2020).

The use of Sales Growth also supports the marketing perspective adopted in this research. Previous ESG studies have largely examined financial indicators including firm value stock returns profitability and Tobin's Q (Friede et al., 2015; Buallay et al., 2023). A marketing perspective places greater emphasis on the behavioural response generated by ESG communication which should ultimately become visible through customer demand and increased sales (Tran & Pham, 2022; Yu

& Zheng, 2020). Sales Growth therefore provides a relevant measure for assessing whether ESG disclosure creates tangible commercial value by strengthening stakeholder trust and improving market perceptions of the firm (Pham & Tran, 2020).

In this study, Sales Growth is calculated as the year-on-year percentage change in total sales revenue drawn from each company's Annual Report, using the following formula:

$$\text{Sales Growth} = \frac{\text{Sales Revenue}_t - \text{Sales Revenue}_{t-1}}{\text{Sales Revenue}_{t-1}}$$

where Sales Revenue_t is the company's total sales revenue in the current year and Sales Revenue_{t-1} is the total sales revenue in the prior year. A higher sales growth rate points to stronger commercial performance and suggests the company is doing well at expanding its market presence (Zhang et al., 2020). In our research model, Sales Growth sits as the final outcome at the end of the line where ESG Disclosure's effect is expected to show up, but only indirectly, through Media Exposure (Zheng et al., 2022).

2.4 Media Exposure as a Mediating Variable

Media Exposure represents the level of attention that independent news organisations give to a firm's ESG activities and disclosures. This variable reflects the visibility of sustainability initiatives through newspapers online news portals and other professional media channels. Corporate sustainability reports generally target investors regulators and sustainability practitioners whereas news coverage can reach customers suppliers business partners and the wider public. This wider audience gives media exposure an important function in increasing public awareness and influencing stakeholder perceptions of corporate responsibility.

This study positions Media Exposure as a mediating variable that explains how ESG Disclosure may affect Sales Growth. Firms communicate sustainability information through Annual Reports and Sustainability Reports but these publications often reach a relatively limited audience and rarely attract ordinary consumers. Independent media organisations can act as information intermediaries by selecting

interpreting and presenting ESG content in a more accessible form. Greater media attention can increase stakeholder awareness of corporate sustainability practices which may strengthen reputation build trust and influence purchasing decisions. Media Exposure is therefore expected to transmit part of the relationship between ESG Disclosure and Sales Growth in line with the mediation framework proposed by Zheng et al. (2022).

This research measures Media Exposure through the number of ESG-related news articles published by credible online media organisations during each observation year. The study collects relevant articles through Google News and restricts the sample to reports produced by established professional media outlets. The search process applies standardised company-specific keywords covering ESG sustainability environmental social governance and corporate responsibility. Researchers limit the results to publications released during the corresponding observation year and remove duplicate articles blogs social media content discussion forums and corporate press releases that do not represent independent journalism. This procedure provides a systematic measure of the public media attention generated by each firm's ESG activities and disclosures.

Within the proposed research model Media Exposure functions as the communication pathway that increases the visibility of ESG Disclosure among external stakeholders. The framework therefore expects more comprehensive and credible sustainability reporting to generate greater media attention which can increase stakeholder awareness strengthen corporate reputation and contribute to higher Sales Growth.

2.4.1 ESG Disclosure and Media Exposure

ESG disclosure is expected to positively influence Media Exposure because more comprehensive sustainability information provides journalists with relevant material for news production. Corporate reporting on carbon reduction initiatives renewable energy investment employee welfare community development and governance improvements can create substantive topics for media coverage and increase the visibility of corporate sustainability activities. Greater transparency and

detail also provide independent media organisations with more reliable information for developing ESG-related stories which can expand public awareness of a firm's sustainability efforts.

Signalling Theory explains this relationship by viewing ESG disclosure as a positive signal of a firm's commitment to responsible and sustainable business practices. The effectiveness of such a signal depends on its ability to reach external audiences and independent media can facilitate this process by interpreting verifying and distributing corporate sustainability information to a broader public. While sustainability reports often primarily reach investors regulators and professional audiences media coverage can extend ESG information to customers suppliers business partners and society. More extensive disclosure should therefore create greater opportunities for news organisations to identify credible and relevant material for publication.

Stakeholder Theory provides additional support for this expected relationship because firms use ESG communication to address the information needs of diverse stakeholder groups. Growing expectations for corporate transparency increase the importance of media organisations as intermediaries that transform detailed sustainability information into content that wider audiences can understand. Companies with broader ESG disclosure may consequently receive greater media attention because their environmental social and governance activities provide information that carries relevance for society.

Previous empirical evidence supports this expectation. Zhang Wei and Jiang (2023) found that firms with more extensive ESG disclosure tend to receive greater media coverage because sustainability reporting provides journalists with information for developing ESG-related news. Based on this evidence this study expects Environmental Social and Governance disclosure to each exert a positive influence on Media Exposure. These relationships form the basis of Hypotheses H4 H5 and H6 which examine the effects of Environmental Disclosure Social Disclosure and Governance Disclosure on Media Exposure.

2.4.2 Media Exposure and Sales Growth

Media Exposure is expected to enhance Sales Growth by increasing the visibility and perceived credibility of corporate ESG activities among external stakeholders. Sustainability Reports and Annual Reports provide detailed information on environmental social and governance performance but their readership generally remains concentrated among investors regulators and sustainability professionals. Independent news coverage can reach a broader audience that includes customers suppliers business partners and the general public. These stakeholder groups can directly affect commercial outcomes through their purchasing choices and business relationships with the company.

Signalling Theory provides a basis for explaining this relationship because media coverage can reinforce ESG disclosure through an independent communication channel that strengthens the credibility of corporate information. Reports from reputable news organisations may appear more objective and reliable than statements issued directly by the firms being assessed. Positive coverage of ESG initiatives can therefore shape stakeholder perceptions of corporate reputation responsible conduct and long-term commitment to sustainable operations.

Legitimacy Theory also supports the proposed relationship through the concept of public acceptance described by Suchman (1995). Firms seek legitimacy by demonstrating that their activities correspond with prevailing societal expectations. Favorable media coverage can provide external recognition of corporate ESG commitments and make sustainability claims appear more credible than unsupported corporate statements. Stronger legitimacy may increase stakeholder trust improve corporate reputation and encourage customers and business partners to develop stronger relationships with the firm.

Empirical findings further reinforce this expected effect. Zheng et al. (2022) demonstrate that greater media attention can increase stakeholder awareness and strengthen the market influence of corporate sustainability activities through wider information dissemination and reduced information asymmetry. This study therefore

expects Media Exposure to contribute positively to Sales Growth by strengthening stakeholder trust and encouraging favorable purchasing behavior. This proposed relationship supports Hypothesis H7 which states that Media Exposure has a positive effect on Sales Growth.

2.4.3 Disclosure Credibility and the Risk of Greenwashing

The mediation framework in this study assumes that ESG disclosure generates media coverage that is generally positive and credible. Firms that provide transparent and comprehensive sustainability information are expected to receive favorable media attention which can strengthen stakeholder trust and contribute to higher Sales Growth. This mechanism however depends heavily on the credibility of the reported information. When ESG disclosure fails to represent actual corporate performance media attention may produce the opposite outcome by creating negative stakeholder perceptions and reducing the intended benefits of sustainability communication.

The Volkswagen Dieselgate scandal discussed in Chapter 1 provides a clear example of this risk. Volkswagen strongly promoted its Clean Diesel technology as an environmentally responsible innovation and received considerable media attention for its sustainability claims. Investigations later revealed that the company had manipulated emissions tests which exposed a substantial inconsistency between its public statements and actual practices. Media coverage subsequently shifted toward strong negative attention which damaged corporate reputation weakened stakeholder trust and generated financial penalties exceeding USD 30 billion (Siano et al., 2017; U.S. Department of Justice, 2016). This case shows that media exposure can intensify the consequences of misleading ESG communication rather than strengthen corporate legitimacy.

Greenwashing describes this situation when firms present strong sustainability claims without sufficient evidence of corresponding actions. Lee and Raschke (2023) identify greenwashing as a major risk associated with ESG disclosure because extensive sustainability communication can initially attract favorable media attention but later generate negative coverage when stakeholders discover inconsistencies between corporate claims and actual performance. Media exposure may then

undermine legitimacy by spreading evidence of stakeholder distrust reputational deterioration and declining market confidence.

The risk of greenwashing carries particular relevance for Indonesia's energy and mining sector because firms in these industries face substantial environmental scrutiny and must comply with various sustainability requirements. Environmental performance assessments through the PROPER programme further increase public attention toward corporate environmental conduct and create stronger expectations for companies to ensure that ESG communication accurately reflects their actual sustainability performance. Since POJK No. 51/POJK.03/2017 came into effect, many firms have stepped up the volume of their ESG reporting, but the gap between what they claim and what they actually do on the ground remains a real worry. So stakeholders might not necessarily respond positively to ESG disclosure if they get the sense that it's more symbolic than substantive.

The effectiveness of ESG disclosure as a market-facing signal therefore depends not only on the quantity of information disclosed but also on the credibility and authenticity of the sustainability practices underlying those disclosures. Greenwashing is not modeled or measured as a variable in this study; it is discussed here only as a contextual explanation that may help interpret a weak or negative mediation result, and it is revisited as a direction for future research in Chapter V rather than treated as a confirmed feature of the present model.

2.5 Previous Studies and Research Gap

Table 2.1 Summary of Previous Studies and Research Gap

Researcher (Year)	Research Focus	ESG Variable	Outcome / Mechanism	Finding	Relative Limitation
Tran & Pham (2022) primary reference	ESG disclosure & sales, global firms (826 firms, 2005–2011)	E, S, G, aggregate ESG, and interactions	Sales revenue	ESG and S positive on sales; effect stronger during market turbulence	Global sample, not sector-specific to Indonesian energy/mining; does not test media exposure as an explicit mediator
Lee & Raschke (2023)	Greenwashing, stakeholder legitimacy, and financial performance	Greenwashing / disclosure-practice gap	Firm legitimacy, financial performance	Greenwashing undermines the legitimacy benefits of disclosure	Conceptual/legitimacy focus; not a quantitative sales/media-exposure model
Zhang, Wei & Jiang (2023)	ESG disclosure, earnings management, and media attention, China	Aggregate ESG	Earnings management (media attention as a moderating/substitutive mechanism)	ESG disclosure attracts media attention; media attention interacts with ESG's governance effect	Different outcome variable (earnings management, not sales); China context; models media attention as moderator, not mediator
Angela & Rusmanto (2025)	ESG disclosure & media exposure, Indonesia	E, S, G, aggregate ESG	ROE, PBV	Governance significant pre-pandemic only; media exposure negative on PBV	Indonesia-specific and includes media exposure, but outcome is profitability/firm value, not sales growth

Source: Author's Compilation (2026)

Taken together, Tran and Pham (2022) establish that ESG disclosure and Social disclosure specifically can promote sales at the global level, but do not test the sector-specific Indonesian energy and mining context, nor do they formally model media exposure as the mechanism connecting disclosure to sales. Lee and Raschke (2023) establish the theoretical risk that this mechanism can fail when disclosure is not credible, but do not test this within a quantitative sales-growth model. Zhang, Wei, and Jiang (2023) and Angela and Rusmanto (2025) confirm that ESG disclosure attracts media attention and that media exposure matters for firm outcomes in practice, but neither tests media exposure as a mediator of a sales growth outcome. This study addresses this combined gap by testing ESG disclosure's effect on sales growth in Indonesian energy and mining companies, with media exposure formally modeled as a mediating mechanism, over the 2021–2025 period.

2.6 Hypothesis Development

Based on the research framework in Section 2.7, the following seven hypotheses are formulated.

The rationale for H1–H3 follows directly from Tran and Pham (2022), who find that overall ESG disclosure, and Social disclosure in particular, is positively associated with sales performance across a global sample of firms, an effect they attribute to disclosure functioning as a legitimacy-building signal that customers and business partners factor into their transacting decisions. Buallay et al. (2023) similarly report that ESG disclosure is linked to improved market-facing outcomes when disclosure quality is sufficiently high. On this basis, each disclosure dimension is expected to exert an independent positive effect on sales growth.

H1: Environmental disclosure positively influences sales growth.

H2: Social disclosure positively influences sales growth.

H3: Governance disclosure positively influences sales growth.

The rationale for H4–H6 draws on the media-attention literature. Zhang, Wei, and Jiang (2023) show that firms with higher ESG disclosure levels attract greater media attention because disclosure itself supplies verifiable, newsworthy material for

journalists to report on, while Angela and Rusmanto (2025), studying Indonesian firms directly, confirm that ESG disclosure and media exposure are empirically linked in the local market context. Each ESG component is therefore expected to positively influence the volume of media coverage a firm receives, consistent with the disclosure-to-media pathway set out in Section 2.4.1.

H4: Environmental disclosure positively influences media exposure.

H5: Social disclosure positively influences media exposure.

H6: Governance disclosure positively influences media exposure.

The rationale for H7 follows from legitimacy theory (Suchman, 1995) and from Zheng et al. (2022), who argue that independent media coverage lends a firm's sustainability claims a credibility that self-reported disclosure alone cannot achieve, and that this externally validated legitimacy is more persuasive to the market than the underlying disclosure document. Media exposure is therefore expected to exert a positive direct effect on sales growth, completing the mediating pathway through which ESG disclosure is hypothesised to influence commercial performance.

H7: Media exposure positively influences sales growth.

2.7 Research Framework

Figure 2.1 presents the conceptual research framework. Environmental (E), Social (S), and Governance (G) disclosure each exert a direct effect on Sales Growth (H1–H3) and on Media Exposure (H4–H6). Media Exposure, in turn, exerts a direct effect on Sales Growth (H7). Through the combination of H4–H6 and H7, Media Exposure is positioned as the variable mediating the relationship between each ESG component and Sales Growth.

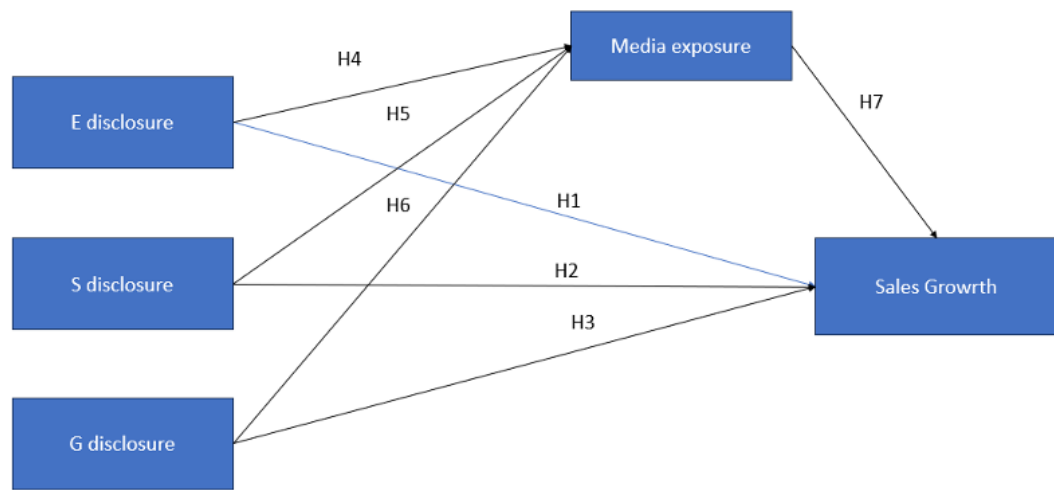


Figure 2.1 Conceptual Research Framework
Source: Author's Compilation (2026).

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

This study uses a quantitative, explanatory research design (Saunders et al., 2019) to examine the direct effects of Environmental (E), Social (S), and Governance (G) disclosure on sales growth (H1–H3) and on media exposure (H4–H6), the direct effect of media exposure on sales growth (H7), and the resulting mediating role of media exposure in the ESG–sales growth relationship. Secondary panel data covering Indonesian energy and mining companies listed on the IDX for the period 2021–2025 are used. Mediation is tested following the causal-steps approach (Baron & Kenny, 1986) as formalized for regression-based mediation analysis by Hayes (2022), with the significance of each indirect effect confirmed using the Sobel test.

A quantitative causal/explanatory design was chosen, rather than a qualitative or purely descriptive approach, because the study's objective is to test hypothesised cause-and-effect relationships among precisely measurable variables ESG disclosure scores, a media-coverage count, and a percentage sales growth figure across a structured panel of companies and years. This objective calls for statistical hypothesis testing rather than the interpretive, meaning-focused analysis that a qualitative design would provide, and a panel design in particular allows both cross-company and cross-time variation to be exploited, which a single-year cross-sectional design could not.

This design choice follows directly from the methodological approach of this study's primary reference, Tran and Pham (2022), who likewise employ quantitative panel-data regression to test the relationship between ESG disclosure and sales performance across a global sample of firms. Similar quantitative, hypothesis-testing designs have also been used in closely related Indonesian and regional studies, including Zhang, Wei, and Jiang (2023) on ESG disclosure and media attention, and Angela and Rusmanto (2025) on ESG disclosure and media exposure among Indonesian firms, confirming that this design is well established for the type of mediation and disclosure-effect questions this study addresses.

All data processing and statistical analysis in this study including panel-data regression estimation, the Chow and Hausman model-selection tests, diagnostic testing, and the Sobel mediation test were carried out in Python, executed through Google Colab. Google Colab was selected because it provides a free, cloud-based Python environment with the statistical and data-handling libraries required for panel regression (such as pandas, statsmodels, and linearmodels) pre-installed and readily accessible, removing the need for local software installation and making the analysis fully reproducible from the notebook file.

3.2 Population and Sample

3.2.1 Population

The population comprises firms in the energy (IDX: ENRG) and mining/basic materials (IDX: BASIC) segments of the IDX, selected because this sector carries the highest ESG risk exposure in Indonesia per KLHK PROPER ratings and receives intense investor, regulatory, and central to this study media scrutiny of its ESG practices (Buallay et al., 2023).

3.2.2 Sampling Technique, Criteria, and Final Sample

Purposive sampling is used (Saunders et al., 2019), consistent with prior Indonesian ESG studies requiring multi-year disclosure and data availability.

Table 3.1 Purposive Sampling Criteria

No.	Criterion	Rationale
1	Company classified in the energy (ENRG) or mining/basic materials (BASIC) sector and continuously listed on the IDX throughout 2021–2025	Ensures a complete 5-year panel per company
2	Consistently published an Annual Report and/or Sustainability Report each year in the study period	Required for GRI-based ESG disclosure scoring
3	Complete sales/revenue data available	Necessary for sales growth calculation
4	Company information must be searchable using a news archive (e.g., Google News) for each observation year, including firm-	Necessary for media exposure measurement

No.	Criterion	Rationale
	years in which no qualifying ESG-related news articles are identified	
5	Not subject to delisting, trading suspension, or major financial restructuring during the study period	Preserves panel integrity
6	Financial statements presented in Indonesian Rupiah (IDR)	Ensures uniformity of financial measurements

Source: Author's Compilation (2026)

Applying these criteria to the population of IDX-listed energy and mining companies yields a final sample of 25 companies, observed over 5 years (2021-2025), for a total of 125 firm-year observations.

Traceability of media coverage (Criterion 4) is assessed against a defined list of trusted, professionally edited Indonesian and international news outlets, so that the media-exposure count described in Section 3.3.2 is drawn from credible journalistic sources rather than from blogs, forums, or unverified social media content. The trusted-media list comprises: Kontan, Bisnis Indonesia, Kompas, CNBC Indonesia, CNN Indonesia, Katadata, Investor Daily, IDX Channel, Tempo, The Jakarta Post, Antara News, Detik Finance, and, for international coverage, Reuters and Bloomberg. A company-year is retained in the sample only if traceable coverage from at least one of these outlets can be located for that year.

Table 3.2 Final List of Sample Companies

No.	Ticker	Company Name
1	ABMM	PT ABM Investama Tbk
2	ADRO	PT Alamtri Resources Indonesia Tbk (ex PT Adaro Energy Indonesia Tbk)
3	AKRA	PT AKR Corporindo Tbk
4	ANTM	PT Aneka Tambang Tbk
5	BRPT	PT Barito Pacific Tbk
6	BYAN	PT Bayan Resources Tbk
7	BMWA	PT Bumi Mineral Wasesa Tbk
8	BUMI	PT Bumi Resources Tbk
9	DOID	PT Delta Dunia Makmur Tbk

No.	Ticker	Company Name
10	DSSA	PT Dian Swastatika Sentosa Tbk
11	ELSA	PT Elnusa Tbk
12	ESSA	PT ESSA Industries Indonesia Tbk
13	GEMS	PT Golden Energy Mines Tbk
14	HRUM	PT Harum Energy Tbk
15	INDY	PT Indika Energy Tbk
16	ITMG	PT Indo Tambangraya Megah Tbk
17	ZINC	PT Kapuas Prima Coal Tbk
18	MEDC	PT Medco Energi Internasional Tbk
19	MDKA	PT Merdeka Copper Gold Tbk
20	MBAP	PT Mitrabara Adiperdana Tbk
21	PTRO	PT Petrosea Tbk
22	MYOH	PT Samindo Resources Tbk
23	TOBA	PT TBS Energi Utama Tbk
24	TINS	PT Timah Tbk
25	UNTR	PT United Tractors Tbk

Source: Author's Compilation (2026).

3.3 Operational Definition and Variable Measurement

Table 3.3 Operational Definition of Research Variables

Variable	Type	Operational Definition	Proxy / Measurement	Data Source
Environmental Disclosure (E)	Independent	Extent of environmental disclosure	GRI 300-series checklist score (0–1)	Annual Report, Sustainability Report
Social Disclosure (S)	Independent	Extent of social/labor disclosure	GRI 400-series checklist score (0–1)	Annual Report, Sustainability Report
Governance Disclosure (G)	Independent	Extent of governance disclosure	GRI-based governance checklist score (GRI 2, GRI 205, GRI 415, and	Annual Report,

Variable	Type	Operational Definition	Proxy / Measurement	Data Source
			governance standards) (0–1)	Sustainability Report
Media Exposure (MEX)	Mediating	Volume of independent ESG-related media coverage of the firm	Count of ESG-related news articles per firm- year (Google News or equivalent archive)	Google News archive
Sales Growth	Dependent	Year-on-year change in company sales	$(\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$	Annual Report, IDX

Source: Author's Compilation (2026)

3.3.1 ESG Disclosure Score Measurement Procedure

ESG disclosure is measured using a GRI Standards-based checklist of 24 items (8 Environmental, 8 Social, 8 Governance), scored 1 if disclosed with specific supporting data and 0 otherwise, following the dichotomous content-analysis approach used in prior Indonesian ESG research. Inter-rater reliability is checked on at least 20% of firm-year observations using Cohen's Kappa (threshold ≥ 0.70 ; Neuendorf, 2017).

In practice, data collection for each firm-year proceeds in three steps. First, the company's Annual Report and/or Sustainability Report for the relevant year is downloaded either from the Indonesia Stock Exchange website (www.idx.co.id, under the company profile and financial-report section) or directly from the company's own investor-relations webpage; where a company issues a combined Annual Report rather than a stand-alone Sustainability Report, the sustainability section within the Annual Report is used instead. Second, the report is searched systematically against each of the 24 checklist items below, using the specific GRI disclosure code (e.g., GRI 302-1, GRI 403-1) and associated keywords as search terms, and each item is scored 1 only where the disclosure is supported by specific data or a concrete description, and 0 where the topic is mentioned only in general or aspirational language. Third, each scored item is recorded together with the exact page number of the supporting disclosure, so that the coding can be independently verified during the inter-rater reliability check described above.

a) Environmental Disclosure Indicators

This study measures Environmental Disclosure using eight indicators adapted from the Global Reporting Initiative (GRI) Standards 2021, specifically the GRI 300 Series. The indicators include energy consumption (GRI 302-1), energy intensity (GRI 302-3), water withdrawal and consumption (GRI 303-3), biodiversity impacts (GRI 304-1), direct greenhouse gas emissions (GRI 305-1), indirect greenhouse gas emissions (GRI 305-2), waste generation and management (GRI 306-3), and environmental compliance (GRI 307-1). These indicators were selected because they represent the most material environmental issues affecting the Indonesian energy and mining industry and are consistently disclosed within corporate Sustainability Reports prepared under the GRI framework (GRI Standards, 2021).

b) Social Disclosure Indicators

This study measures Social Disclosure using eight indicators adapted from the GRI 400 Series. These indicators include employee recruitment and turnover (GRI 401-1), occupational health and safety management systems (GRI 403-1), work-related injuries (GRI 403-9), training and employee development (GRI 404-1), diversity and equal opportunity (GRI 405-1), non-discrimination (GRI 406-1), local community engagement (GRI 413-1), and customer health and safety (GRI 416-1). These disclosure items were selected because they represent the most relevant social aspects within the energy and mining sector, where employee welfare, workplace safety, and community relationships significantly influence stakeholder perceptions. Furthermore, Tran and Pham (2022) reported that Social Disclosure consistently exhibits the strongest relationship with sales performance, making it an essential dimension in examining the relationship between ESG disclosure and sales growth.

c) Governance Disclosure Indicators

Unlike the Environmental and Social dimensions, Governance Disclosure in this study is measured using governance-related indicators adapted from both the GRI Standards and Indonesia's Good Corporate Governance (GCG)

principles issued by the Financial Services Authority (OJK) and the National Committee on Governance Policy (KNKG). The governance assessment consists of eight indicators: governance structure and composition of the highest governance body (GRI 2-9, previously GRI 102-18), board oversight of sustainability strategy and risk management (GRI 2-12, previously GRI 102-22), assessment of corruption risks (GRI 205-1), communication and training on anti-corruption policies (GRI 205-2), confirmed incidents of corruption and actions taken (GRI 205-3), political contributions and public policy participation (GRI 415-1), remuneration policies for members of the highest governance body (GRI 2-19, previously GRI 102-35), and governance of material economic, environmental, and social impacts (GRI 2-24, previously GRI 102-29). These indicators were selected because they represent the governance practices most frequently disclosed in Annual Reports and Sustainability Reports of Indonesian listed companies and are considered highly relevant for evaluating corporate governance transparency within the energy and mining sector.

Since this study covers the period from 2021 to 2025, companies may adopt different versions of the GRI Standards throughout the observation period. Therefore, disclosures reported under the former GRI 102 indicators are considered equivalent to their corresponding GRI 2 indicators introduced in the GRI Universal Standards 2021. This approach ensures consistency in the content analysis while accommodating changes in reporting standards across the study period.

3.3.2 Media Exposure Measurement Procedure

Media exposure is measured as the count of news articles mentioning the company name together with ESG-related keywords, retrieved separately for each sample year from 2021 to 2025, following an approach consistent with prior media-attention studies (Zhang, Wei, & Jiang, 2023). Given the disclosure-credibility discussion in Section 2.4.3, the tone of coverage (favorable versus unfavorable) is also

recorded for each article to allow a supplementary robustness check of whether the mediation effect holds when only favorable coverage is counted.

3.3.3 Sales Growth Calculation

$$\text{Sales Growth (i,t)} = (\text{Sales(i,t)} - \text{Sales(i,t-1)}) / \text{Sales(i,t-1)}$$

Sales figures are drawn from audited annual reports and cross-checked against IDX-published financial statements. Sales revenue for 2020 was collected solely as the baseline required to compute sales growth for the first observation year, 2021. To reduce the influence of extreme firm-year observations, Sales Growth is winsorized at the 1st and 99th percentiles.

3.4 Data Sources and Collection Procedure

Data are secondary, collected through documentary analysis from: (1) Annual Reports and Sustainability Reports (IDX website and company investor-relations pages) for ESG scoring and sales data; (2) a news archive (Google News or an equivalent database) for media exposure counts and tone coding; and (3) the IDX Factbook and Sector Classification Database for population and sector verification.

3.5 Research Model and Regression Equations

Mediation is tested using the three-equation causal-steps approach (Baron & Kenny, 1986; Hayes, 2022). Let ESG_k denote each disclosure component (E, S, or G) in turn.

a) Step 1: Total effect (Path C)

The effect of ESG disclosure on sales growth, ignoring the mediator.

$$\text{SalesGrowth(i,t)} = \alpha + \beta_1 E(i,t) + \beta_2 S(i,t) + \beta_3 G(i,t) + \varepsilon(i,t)$$

This equation tests H1–H3.

b) Step 2: Path A

The effect of ESG disclosure on the mediator, media exposure.

$$\text{MediaExposure(i,t)} = \alpha + \beta_1 E(i,t) + \beta_2 S(i,t) + \beta_3 G(i,t) + \varepsilon(i,t)$$

This equation tests H4–H6.

c) Step 3: Path B and Direct Effect C

The effect of media exposure on sales growth, controlling for ESG disclosure.

$$\text{SalesGrowth}(i,t) = \alpha + \beta_1 E(i,t) + \beta_2 S(i,t) + \beta_3 G(i,t) + \beta_4 \text{MediaExposure}(i,t) + \varepsilon(i,t)$$

This equation tests H7 (the coefficient on Media Exposure) and provides the direct-effect estimate (c') needed to compute each indirect effect.

For each ESG component k , the indirect effect is the product of its path-a coefficient (from Step 2) and the path-b coefficient of Media Exposure (from Step 3): $\text{indirect effect}(k) = a(k) \times b$. The statistical significance of each indirect effect is tested using the Sobel test. Full mediation is indicated where the direct effect of the corresponding ESG component in Step 3 (c') becomes statistically non-significant relative to its total effect in Step 1 (c); partial mediation is indicated where c' remains significant but is reduced in magnitude relative to c.

3.6 Data Analysis Techniques

Panel data regression combines cross-sectional and time-series variation to estimate the three equations presented in Section 3.5. For each equation this study evaluates three alternative model specifications which include Pooled OLS as the common-effect model Fixed Effects Model (FEM) and Random Effects Model (REM).

3.7 Model Selection

The panel data model selection process follows three sequential tests. The Chow (F) Test first determines whether the Fixed Effects Model (FEM) provides a better specification than Pooled OLS. The Breusch-Pagan Lagrange Multiplier (LM) Test then evaluates whether the Random Effects Model (REM) offers a better fit than Pooled OLS. When both tests indicate the presence of panel effects the Hausman Test compares FEM with REM to identify the more appropriate specification. This testing procedure applies independently to each of the three regression equations presented in Section 3.5. A significant Chow Test result indicates that FEM should replace Pooled OLS while a significant Hausman Test result supports FEM over REM. An

insignificant Hausman result indicates that REM represents the more efficient model choice.

3.8 Descriptive Statistics

Descriptive statistical analysis provides an initial overview of the characteristics and distribution of the research data before panel data regression is performed. This procedure describes the main properties of Environmental Disclosure (E), Social Disclosure (S), Governance Disclosure (G), Media Exposure, and Sales Growth through the mean median minimum maximum and standard deviation. These measures indicate the central tendency variation and general distribution of the observations which helps establish a clearer picture of the sample characteristics. The analysis also identifies potential outliers and unusual observations that could affect the regression estimates while providing an initial assessment of whether the dataset is appropriate for further statistical testing.

3.9 Diagnostic Tests

Prior to estimating the panel data regression models, several diagnostic tests are conducted to ensure that the regression results satisfy the classical assumptions and produce reliable parameter estimates.

a) Multicollinearity

Multicollinearity is tested using the Variance Inflation Factor (VIF) to examine whether high correlations exist among the independent variables. High multicollinearity may inflate the standard errors of the estimated coefficients and reduce the reliability of hypothesis testing. A VIF value below 10 indicates that multicollinearity is not a serious concern. The VIF test is performed separately for each of the three regression equations.

b) Heteroskedasticity

Heteroskedasticity is examined using the Breusch–Pagan Test to determine whether the variance of the regression residuals remains constant across

observations. If heteroskedasticity is present, the estimated standard errors may become biased, leading to unreliable statistical inference. Therefore, heteroskedasticity-robust standard errors are applied to obtain consistent and reliable significance tests whenever heteroskedasticity is detected.

c) Autocorrelation

Firm-level clustered standard errors are employed throughout the analysis. Clustering at the firm level addresses serial correlation within firms over time, achieving the same objective that a formal autocorrelation test (such as the Wooldridge test) is designed to detect, and improves the reliability of the regression results without requiring a separate diagnostic test.

3.10 Hypothesis Testing

After selecting the appropriate panel data model, hypothesis testing is conducted to examine the proposed relationships among the research variables. The following statistical tests are employed:

a) t-test

The t-test is used to examine the statistical significance of each individual regression coefficient and to determine whether each independent variable has a significant effect on the dependent variable. The hypotheses (H1–H7) are evaluated at the 5% significance level ($\alpha = 0.05$). A p-value less than 0.05 indicates that the corresponding hypothesis is supported.

b) Sobel Test

The Sobel Test is employed to examine the significance of the indirect effect of ESG Disclosure on Sales Growth through Media Exposure. The test evaluates whether the product of path coefficients $a \times b$ is statistically significant, where path a represents the effect of ESG Disclosure on Media Exposure and path b represents the effect of Media Exposure on Sales Growth. A significant Sobel Test result indicates that Media Exposure serves as a significant mediating variable in the proposed research model.

c) F-test

The F-test is conducted to assess the overall significance of each regression equation by determining whether all independent variables jointly explain the variation in the dependent variable. A statistically significant F-test indicates that the regression model is appropriate and provides explanatory power for the dependent variable.

d) Coefficient of Determination (R^2)

The coefficient of determination (R^2) is used to measure the explanatory power of each regression model. The R^2 value indicates the proportion of variation in the dependent variable that can be explained by the independent variables included in the model. A higher R^2 value suggests that the model has greater explanatory capability, although it should be interpreted together with the regression coefficients and significance tests.

3.11 Research Limitations

a) Sample Size and Media-Data Availability

The requirement of traceable media coverage (Criterion 4) narrows the sample to 25 firms with an established public media profile, which may introduce selection bias toward larger or more visible companies within the sector.

b) Media Exposure Measurement

Counting news articles captures coverage volume but only partially captures reach and audience impact; the supplementary tone-coding described in Section 3.3.2 mitigates but does not eliminate this limitation.

c) Greenwashing and Disclosure Credibility

As discussed in Section 2.4.3, this study measures disclosure and media coverage, not independently verified ESG performance. A significant positive mediation effect should be interpreted as evidence that, on average, sampled firms' disclosure and the coverage it generates are functioning as a credible signal not as proof that every firm's disclosure is substantively accurate.

d) Sobel Test Assumptions

The Sobel test assumes a normal sampling distribution of the indirect effect, which can be conservative in smaller panels; bootstrapped confidence intervals are recommended as a robustness check where software permits.

e) No Control Variables

This study does not include firm-level control variables (e.g., firm size, leverage) in the regression models; omitted firm-level heterogeneity that is correlated with both ESG disclosure and sales growth could therefore affect the estimated coefficients.

f) Structural Shocks

The 2021–2025 study period includes the post-pandemic commodity super-cycle, with sharply elevated coal and nickel prices in 2021–2022 followed by price normalisation in 2023–2024, which may introduce a structural break in both media coverage patterns and sales performance.

g) Software Limitation

All statistical analyses in this study are conducted in Python, using the `statsmodels` and `linearmodels` packages for panel-data fixed/random-effects estimation, diagnostic testing, and mediation analysis, executed via Google Colab notebooks. This is consistent with the approach and results reported in Chapter IV.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Overview of the Final Sample

This chapter presents the empirical results of the data processing procedures specified in Chapter III and discusses their theoretical implications. The analysis was conducted in Python using the statsmodels and linearmodels libraries, which natively support fixed-effects and random-effects panel estimation, the Chow and Hausman model-selection tests, clustered standard errors, and the Sobel mediation test.

After applying the purposive sampling criteria set out in Section 3.2.2 to the population of energy and mining companies listed on the Indonesia Stock Exchange, the final sample consists of 25 companies observed over five consecutive years (2021-2025), producing a strongly balanced panel of 125 firm-year observations. Every company in the sample has complete data for all three constructs, so no observation was lost to listwise deletion. The final sample comprises ABMM, ADRO, AKRA, ANTM, BMWA, BRPT, BUMI, BYAN, DOID, DSSA, ELSA, ESSA, GEMS, HRUM, INDY, ITMG, MBAP, MDKA, MEDC, MYOH, PTRO, TINS, TOBA, UNTR, and ZINC.

Two data-preparation decisions were taken before estimation. First, because the Media Exposure variable is a count that is heavily right-skewed (mean 2.256 articles per firm-year against a maximum of 25, with a substantial number of zero values), it was transformed into $\ln(1 + \text{MEX})$. This natural-logarithm transformation preserves zero observations, reduces the influence of the few very heavily covered firm-years, and permits the coefficient to be interpreted approximately as a semi-elasticity. Second, Sales Growth was winsorized at the 1st and 99th percentiles to limit the leverage of extreme observations, the most notable being a firm-year growth rate exceeding 300 percent that arose from an exceptionally low revenue base in the preceding year. Both adjustments are standard in panel research and are applied uniformly across all three regression equations.

4.2 Descriptive Statistics

Table 4.1 reports the descriptive statistics for all research variables across the 125 firm-year observations.

Table 4.1 Descriptive Statistics of Research Variables

Variable	N	Mean	Median	Std. Dev.	Min	Max
E	125	0.7460	0.8750	0.2675	0.0000	1.0000
S	125	0.8940	1.0000	0.1739	0.1250	1.0000
G	125	0.6540	0.6250	0.1825	0.3750	1.0000
ESG	125	0.7647	0.7917	0.1742	0.2500	0.9583
MEX	125	2.2560	1.0000	4.2897	0.0000	25.0000
lnMEX	125	0.7478	0.6931	0.8238	0.0000	3.2581
SalesGrowth	125	0.2554	0.0740	0.6046	-1.0000	3.1112

Source: Data processed by The Author (2026)

Three patterns emerge from Table 4.1. First, disclosure levels in this sector are high but uneven across the three ESG dimensions. Social disclosure records the highest mean (0.894) with a median of 1.000, indicating that a majority of firm-years disclose all eight GRI 400-series items assessed. Environmental disclosure follows with a mean of 0.746, although its standard deviation of 0.268 is the largest of the three, and its minimum of 0.000 shows that at least one firm-year disclosed none of the eight environmental indicators. Governance disclosure has the lowest mean (0.654) and the highest floor (minimum 0.375), which indicates that governance reporting is uniformly present but rarely comprehensive: most firms disclose the basic board-structure and anti-corruption items while omitting items such as remuneration policy and political contributions.

Second, media exposure is scarce and highly concentrated. The mean of 2.256 ESG-related articles per firm-year sits against a median of only 1.000 and a maximum of 25, and the standard deviation (4.290) is nearly twice the mean. This distribution confirms that independent ESG-related coverage of Indonesian energy and mining issuers is dominated by a small number of large, high-visibility firms, while the majority of issuers attract almost no ESG-specific journalistic attention in a given year.

This asymmetry is precisely the condition that motivated the logarithmic transformation described in Section 4.1.

Third, Sales Growth exhibits substantial dispersion (standard deviation 0.605) around a mean of 0.255 and a much lower median of 0.074. The gap between mean and median reflects a right-skewed distribution. The temporal pattern is consistent with the commodity-price cycle observed in 2021-2024, during which coal and nickel prices rose sharply in 2021-2022 before normalising in 2023-2024, although commodity prices are not directly tested as a variable in this study. The minimum value of -1.000 corresponds to a firm-year in which revenue effectively collapsed relative to the prior year.

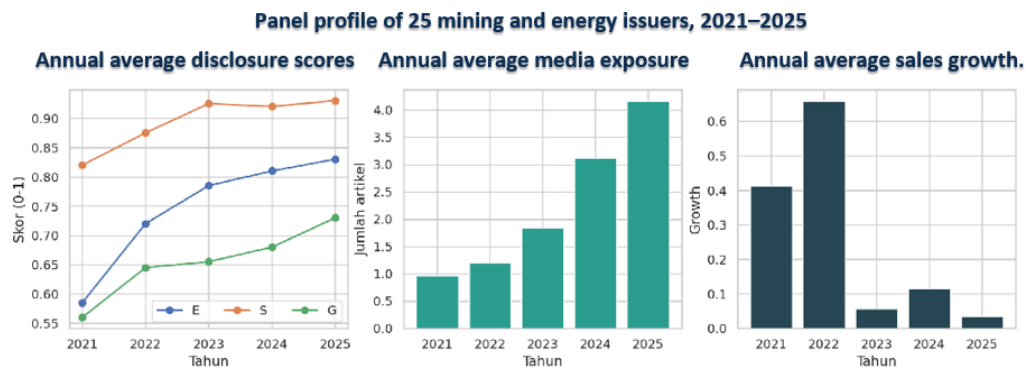


Figure 4.1 Annual Trends in ESG Disclosure, Media Exposure, and Sales Growth (2021-2025)

Source: Data Processed by The Author (2026)

Figure 4.1 places these statistics in temporal context. The left panel shows that average disclosure scores are broadly stable across the observation window, with a mild upward drift in Environmental and Governance disclosure consistent with the progressive institutionalisation of POJK No. 51/POJK.03/2017 reporting practice. The middle panel shows that average media exposure rises materially from 2023 onward, peaking in 2025, which coincides with heightened public debate over nickel downstreaming and the energy transition. The right panel shows the commodity cycle clearly: strongly positive average sales growth in 2021-2022 followed by a contraction in 2023-2024 and a partial recovery in 2025. The visual divergence between the disclosure trend (flat), the media trend (rising), and the sales trend (cyclical) already

provides an informal indication that sales growth in this sector is governed primarily by commodity-price dynamics rather than by disclosure behaviour.

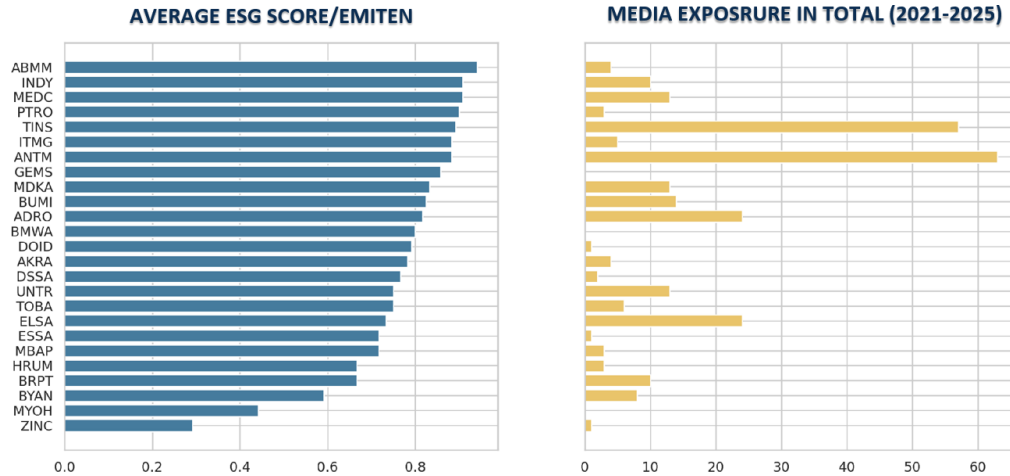


Figure 4.2 Average ESG Score and Cumulative Media Exposure by Issuer (2021-2025)
Source: Data Processed by The Author (2026)

Figure 4.2 disaggregates the sample by issuer. The left panel shows a wide cross-sectional spread in average ESG disclosure, with established large-capitalisation issuers clustering near the upper bound and several smaller issuers scoring well below the sample mean. The right panel shows that cumulative media exposure is far more unequally distributed than disclosure: a handful of issuers account for a disproportionate share of total ESG-related coverage, while a number of issuers recorded zero or near-zero coverage across the entire five-year window. The contrast between a relatively compressed disclosure distribution and a highly concentrated media distribution is an important descriptive finding in its own right, because it implies that disclosure effort and media visibility are only loosely coupled in this sector.

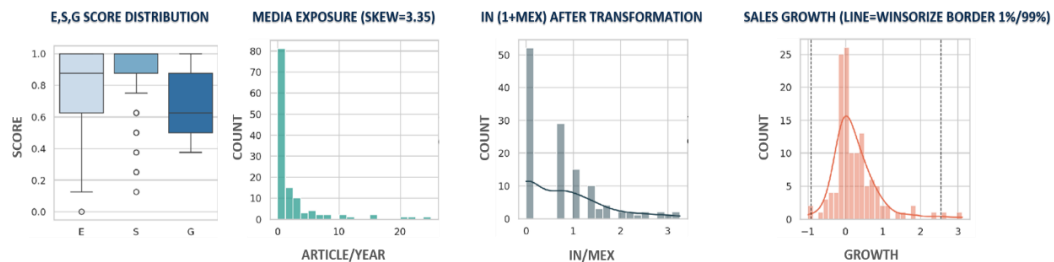


Figure 4.3 Distribution of Research Variables and Effect of Data Transformation

Source: Data Processed by The Author (2026)

Figure 4.3 documents the distributional properties of each variable and justifies the transformations applied. The first panel confirms the differing dispersion of the three disclosure dimensions. The second panel shows the pronounced right skew of the raw Media Exposure count, and the third panel shows that the $\ln(1 + \text{MEX})$ transformation produces a substantially better-behaved distribution suitable for linear estimation. The fourth panel shows the distribution of Sales Growth together with the 1st and 99th percentile winsorization boundaries, illustrating that the adjustment affects only the extreme tails and leaves the central mass of the distribution unchanged.

4.3 Diagnostic Tests

Before estimating the panel regression models, the diagnostic procedures specified in Section 3.9 were carried out to verify that the classical assumptions are satisfied.

4.3.1 Multicollinearity

Multicollinearity among the three independent variables was assessed using the Variance Inflation Factor. The results are reported in Table 4.2.

Table 4.2 Variance Inflation Factor Test Results

Variable	VIF	Threshold	Conclusion
E	1.5299	< 10	No multicollinearity
S	1.6615	< 10	No multicollinearity
G	1.7921	< 10	No multicollinearity

Source: Data Processed by The Author (2026)

All three explanatory variables record VIF values between 1.53 and 1.79, far below the conventional threshold of 10. Multicollinearity is therefore not a concern, and the coefficients of E, S, and G can be interpreted independently of one another. This is a meaningful result given that the three disclosure dimensions are positively correlated with each other, as shown below; the correlations are moderate rather than severe, so each dimension retains sufficient independent variation to be identified separately.

4.3.2 Correlation Analysis

Figure 4.4 presents the correlation matrix among all model variables alongside the VIF results.

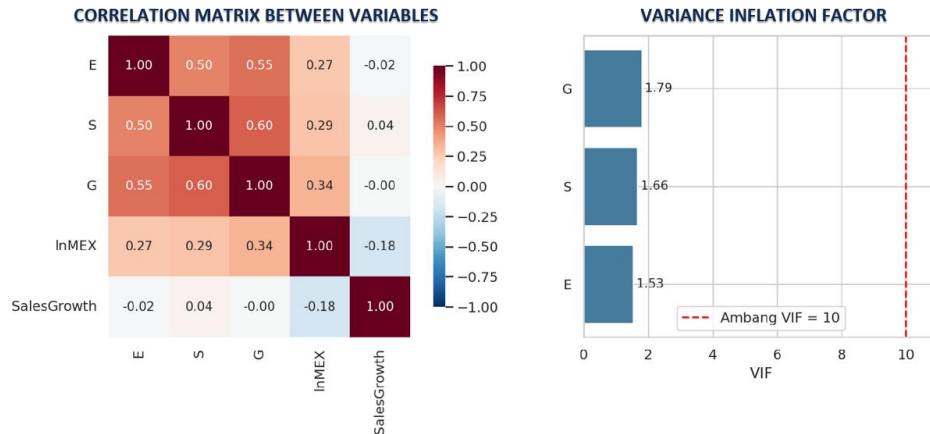


Figure 4.4 Correlation Matrix and Variance Inflation Factors

Source: Data Processed by The Author (2026)

The correlation matrix reveals a coherent structure. The three disclosure dimensions are moderately and positively intercorrelated ($E-S = 0.497$, $E-G = 0.550$, $S-G = 0.598$), consistent with the view that ESG reporting quality is a firm-level capability that tends to move together across dimensions. Each disclosure dimension is positively correlated with $\ln(1 + \text{MEX})$, with Governance showing the strongest association (0.341), followed by Social (0.289) and Environmental (0.268). This provides preliminary bivariate support for the path-a relationships hypothesised in H4 to H6.

Critically, the correlations between the disclosure dimensions and Sales Growth are effectively zero ($E = -0.015$, $S = 0.045$, $G = -0.005$), while the correlation between $\ln(1 + \text{MEX})$ and Sales Growth is negative (-0.183). Even before formal estimation, therefore, the correlation structure signals that the ESG-to-sales link hypothesised in H1 to H3 is unlikely to be supported, and that the sign of the media-to-sales relationship posited in H7 may run opposite to expectation.

4.3.3 Heteroskedasticity and Autocorrelation

The Breusch-Pagan test applied to the residuals of the total-effect equation yields an LM statistic of 2.116 with a p-value of 0.5488, so the null hypothesis of homoskedasticity cannot be rejected at the five percent level. Nevertheless, and consistent with the correction strategy described in Section 3.9, all three equations were estimated using standard errors clustered at the firm level. Firm-level clustering simultaneously addresses any residual heteroskedasticity and the within-firm serial correlation that the Wooldridge test is designed to detect, and it is the conservative approach recommended for short panels with a modest number of cross-sectional units. All coefficient significance levels reported in this chapter are therefore based on cluster-robust standard errors.

4.4 Panel Model Selection

Following Section 3.7, the Chow test and the Hausman test were applied separately to each of the three regression equations. Table 4.3 summarises the outcomes.

Table 4.3 Panel Model Selection Test Results

Equation	Chow Test F (p-value)	Hausman chi-square (p-value)	Selected Model
Eq. 1: Sales Growth $\sim E + S + G$	1.519 (0.0797)	9.454 (0.0238)	Pooled OLS
Eq. 2: $\ln(1+\text{MEX})$ $\sim E + S + G$	6.371 (0.0000)	0.984 (0.8050)	Random Effects

Eq. 3: Sales Growth $\sim E + S +$ $G + \ln(1 + \text{MEX})$	1.409 (0.1236)	9.666 (0.0464)	Pooled OLS
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Source: Data Processed by The Author (2026)

For Equation 1, the Chow test yields $F = 1.519$ ($p = 0.0797$), which does not reject the null of poolability at the five percent level; Pooled OLS is therefore preferred over the Fixed Effect Model. For Equation 2, the Chow test is highly significant ($F = 6.371$, $p = 0.0000$), confirming the presence of substantial unobserved firm heterogeneity in media exposure, but the subsequent Hausman test is insignificant (chi-square = 0.984, $p = 0.8050$), indicating that these firm effects are not systematically correlated with the regressors; the Random Effect Model is therefore the efficient and appropriate estimator. For Equation 3, the Chow test is insignificant ($F = 1.409$, $p = 0.1236$) and Pooled OLS is retained.

The pattern of these selection results is itself informative. Media exposure displays strong, persistent firm-specific effects, which is intuitive: some issuers are structurally more newsworthy than others because of their size, listing profile, and controversy history, and this visibility is stable over time. Sales growth, by contrast, shows no significant firm-specific component once the disclosure variables are included, which is consistent with sales growth in a commodity sector being driven predominantly by common, time-varying price shocks that affect all issuers rather than by persistent firm-level characteristics.

4.5 Panel Regression Results

4.5.1 Total Effect of ESG Disclosure on Sales Growth (H1-H3)

Equation 1 estimates the total effect of each disclosure dimension on sales growth without the mediator. The results are presented in Table 4.4.

Table 4.4 Equation 1 - Total Effect of ESG Disclosure on Sales Growth (Pooled OLS, clustered SE)

Variable	Coefficient	Std. Error	t-statistic	p-value	Conclusion
Constant	0.1520	0.4452	0.341	0.7335	-

Environmental (E)	-0.0796	0.1518	-0.525	0.6009	H1 not supported
Social (S)	0.2517	0.5670	0.444	0.6579	H2 not supported
Governance (G)	-0.1010	0.2863	-0.353	0.7249	H3 not supported
R-squared	0.0037	-	-	-	-
F-statistic (robust)	0.176	-	-	0.9125	Model not significant
Observations	125	-	-	-	25 firms x 5 years

Source: Data Processed by The Author (2026)

None of the three disclosure dimensions exerts a statistically significant effect on sales growth. Environmental disclosure carries a negative coefficient of -0.0796 ($p = 0.6009$), Social disclosure a positive coefficient of 0.2517 ($p = 0.6579$), and Governance disclosure a negative coefficient of -0.1010 ($p = 0.7249$). The model as a whole is not significant, with a robust F-statistic of 0.176 ($p = 0.9125$), and the coefficient of determination is 0.0037, meaning that the three disclosure dimensions jointly explain less than half of one percent of the variation in sales growth. Hypotheses H1, H2, and H3 are therefore not supported.

This is a substantively important null result rather than a mere absence of findings. It indicates that, in the Indonesian energy and mining sector, the volume of ESG information a company discloses bears no measurable relationship to its commercial revenue performance. The direction of the Social coefficient is at least consistent with Tran and Pham (2022), who found Social disclosure to be the dimension most strongly associated with sales, but its magnitude is estimated far too imprecisely to support any inference.

4.5.2 Effect of ESG Disclosure on Media Exposure (H4-H6)

Equation 2 estimates path a, the effect of each disclosure dimension on media exposure. Results are presented in Table 4.5.

Table 4.5 Equation 2 - Effect of ESG Disclosure on Media Exposure (Random Effects, clustered SE)

Variable	Coefficient	Std. Error	t-statistic	p-value	Conclusion
Constant	-0.9228	0.3549	-2.600	0.0105	-

Environmental (E)	0.0657	0.3352	0.196	0.8450	H4 not supported
Social (S)	1.0250	0.4179	2.453	0.0156	H5 supported
Governance (G)	1.0783	0.5412	1.993	0.0486	H6 supported
R-squared	0.1306	-	-	-	-
F-statistic (robust)	6.215	-	-	0.0006	Model significant
Observations	125	-	-	-	25 firms x 5 years

Source: Data Processed by The Author (2026)

In contrast to Equation 1, this model is jointly significant, with a robust F-statistic of 6.215 ($p = 0.0006$) and an R-squared of 0.1306. The results show that Social disclosure has a positive and statistically significant effect on media exposure (coefficient 1.0250, $p = 0.0156$), and Governance disclosure follows a similar pattern (coefficient 1.0783, $p = 0.0486$). Environmental disclosure also shows a positive coefficient but the effect remains statistically insignificant with a coefficient of 0.0657 and a p-value of 0.8450. The results therefore support H5 and H6 while providing no support for H4.

Because the dependent variable uses a logarithmic form, the estimated coefficients represent approximate semi-elasticities. A one-point increase in the Social Disclosure score from reporting none of the eight social indicators to reporting all eight corresponds to an estimated 1.02 log-point increase in ESG-related article counts which translates into approximately 179 percent higher media exposure. Governance disclosure produces a comparable effect of approximately 194 percent. A smaller change provides a more practical interpretation where a 0.10-point increase in Social Disclosure raises expected media exposure by around 10.8 percent while an equivalent increase in Governance Disclosure produces a similar proportional effect when other variables remain constant. These effect sizes carry meaningful economic implications and remain consistent with the signalling argument discussed in Section 2.4.1 because broader disclosure provides journalists with more usable information that can generate additional media coverage.

The insignificant Environmental disclosure result does not mean that environmental matters lack news value within the energy and mining sector because environmental controversies remain central to its public image. The finding instead indicates that environmental news in Indonesian mining and energy tends to originate from external sources such as PROPER evaluations regulatory actions NGO campaigns community conflicts and environmental incidents rather than from corporate sustainability reporting. Environmental coverage therefore appears more event-driven than disclosure-driven which weakens the direct connection between information released by firms and stories produced by the media. Social and governance topics face less external controversy and offer fewer independently observable signals which makes corporate disclosure a more important information source for journalists. This difference helps explain why Social and Governance disclosure generate measurable media coverage while Environmental disclosure does not.

4.5.3 Effect of Media Exposure on Sales Growth and Direct Effects (H7)

Equation 3 introduces media exposure alongside the three disclosure dimensions in order to estimate path b and the direct effects c-prime. Results are presented in Table 4.6.

Table 4.6 Equation 3 - Media Exposure and ESG Disclosure on Sales Growth (Pooled OLS, clustered SE)

Variable	Coefficient	Std. Error	t-statistic	p-value	Conclusion
Constant	0.0650	0.4545	0.143	0.8866	-
Environmental (E)	-0.0391	0.1617	-0.242	0.8092	Direct effect (c') n.s.
Social (S)	0.3284	0.5753	0.571	0.5691	Direct effect (c') n.s.
Governance (G)	0.0502	0.3189	0.157	0.8752	Direct effect (c') n.s.
Media Exposure ln(1+MEX)	-0.1479	0.0789	-1.875	0.0633	H7 not supported
R-squared	0.0420	-	-	-	

F-statistic (robust)	1.185	-	-	0.3211	Model not significant
Observations	125	-	-	-	25 firms x 5 years

Source: Data Processed by The Author (2026)

The coefficient on $\ln(1 + \text{MEX})$ is -0.1479 with a p-value of 0.0633. At the five percent significance level we adopted in Section 3.10, this coefficient doesn't clear the bar, so Hypothesis H7 is not supported. But two things still stand out. First, the coefficient is marginally significant at the ten percent level, so it's not something we can just write off as random noise. Second and this is the more striking part the sign is negative, which runs exactly opposite to what we had hypothesized. If we take the point estimate at face value, it suggests that doubling ESG-related media coverage is actually associated with a drop in sales growth of about 10.3 percentage points.

In this specification, none of the three disclosure coefficients come out significant, and the model only explains about 4.2 percent of the variation in sales growth. The robust F-statistic of 1.185 ($p = 0.3211$) suggests the model isn't jointly significant either. Still, one thing stands out: adding media exposure pushes the R-squared from 0.0037 up to 0.0420, which means media exposure alone accounts for most of the modest explanatory power the model actually has.

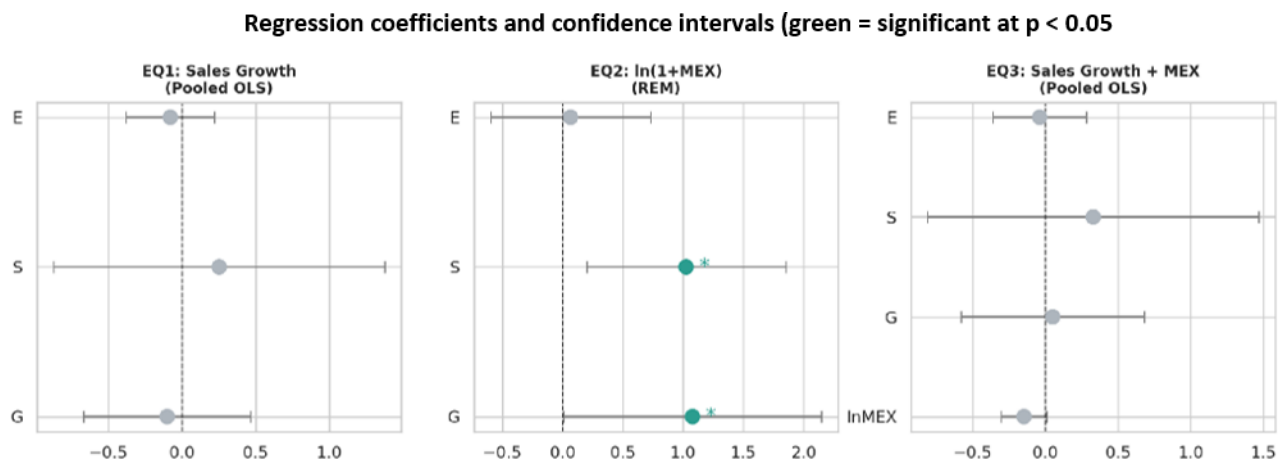


Figure 4.5 Regression Coefficients with 95 Percent Confidence Intervals across the Three Equations

Source: Data Processed by The Author (2026)

Figure 4.5 summarises all three equations visually. The contrast is stark. In Equation 1 and Equation 3, every disclosure coefficient has a confidence interval that comfortably spans zero, reflecting the absence of any detectable relationship with sales growth. In Equation 2, by contrast, the confidence intervals for Social and Governance disclosure lie entirely above zero, providing clear visual confirmation that the disclosure-to-media pathway is the only robustly estimated relationship in the model. The media exposure coefficient in Equation 3 sits just below zero with an interval that barely crosses the zero line, illustrating its marginal and negatively signed character.

4.6 Mediation Analysis: The Sobel Test

Following the causal-steps procedure of Baron and Kenny (1986) as formalised by Hayes (2022), the indirect effect of each disclosure dimension on sales growth through media exposure was computed as the product of its path-a coefficient from Equation 2 and the path-b coefficient of media exposure from Equation 3. Significance was assessed using the Sobel test. Results are reported in Table 4.7.

Table 4.7 Sobel Test of the Indirect Effect through Media Exposure

Path	a (Eq. 2)	b (Eq. 3)	Indirect (a x b)	Sobel SE	z-statistic	p-value	Conclusion
E	0.0657	-0.1479	-0.0097	0.0499	-0.1949	0.8455	No mediation
S	1.0250	-0.1479	-0.1516	0.1018	-1.4894	0.1364	No mediation
G	1.0783	-0.1479	-0.1595	0.1168	-1.3654	0.1721	No mediation

Source: Data Processed by The Author (2026)

None of the three indirect effects is statistically significant. The indirect effect of Environmental disclosure is -0.0097 ($z = -0.195$, $p = 0.8455$), that of Social disclosure is -0.1516 ($z = -1.489$, $p = 0.1364$), and that of Governance disclosure is -0.1595 ($z = -1.365$, $p = 0.1721$). Media Exposure therefore fails to mediate the relationship between each ESG disclosure dimension and Sales Growth which means that the main mediation proposition proposed in this study receives no empirical support.

The pattern behind this non-mediation provides an important explanation for the finding. The mediation process breaks at a specific stage because path a remains strong for two dimensions where Social and Governance disclosure clearly generate media coverage. The weakness appears in path b because media attention does not lead to higher Sales Growth and the estimated relationship instead points toward lower sales performance. Since the indirect effect depends on the product of path a and path b a statistically weak and negative path b will produce indirect effects that remain small negative and insignificant even when path a shows a strong relationship.

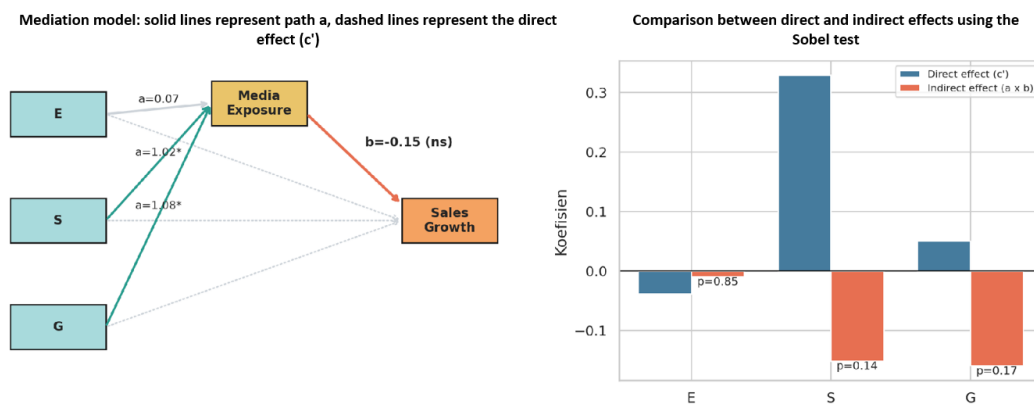


Figure 4.6 Mediation Path Diagram and Decomposition of Direct versus Indirect Effects
Source: Data Processed by The Author (2026)

Figure 4.6 illustrates this asymmetrical pattern clearly. The left panel shows significant solid arrows from Social and Governance disclosure toward Media Exposure while the link between Media Exposure and Sales Growth appears negative but remains statistically insignificant and the three direct relationships with Sales Growth also fail to reach significance. The right panel separates the total effect of each ESG dimension into direct and indirect effects and indicates that Social and Governance disclosure produce negative indirect effects with meaningful magnitudes although neither reaches statistical significance with p-values of 0.14 and 0.17 respectively.

The insignificant total effects reported in Equation 1 should also be considered because they do not meet the traditional Baron and Kenny requirement for mediation testing. Current mediation approaches based on Hayes (2022) do not treat an

insignificant total effect as sufficient reason to exclude a potential indirect relationship and this study therefore applies the Sobel test as described in Section 3.10. Both approaches lead to the same conclusion because the statistical results provide no evidence that Media Exposure mediates the relationship between ESG disclosure and Sales Growth.

4.6.1 Bootstrap Test of the Indirect Effect

To strengthen the Sobel test results which rely on the assumption that the indirect effect follows a normal sampling distribution this study also evaluates the significance of each indirect effect through a bootstrap procedure. Bootstrap inference removes the normality requirement and provides a more robust approach for analysing indirect effects because their sampling distributions often show skewness (Hayes, 2022). Following the analytical procedure described in Section 3.10 this study generates 5,000 bootstrap samples with replacement from 125 firm-year observations. Each resampled dataset re-estimates path a from Equation 2 and path b from Equation 3 before calculating the indirect effect as the product of $a \times b$. The resulting 5,000 estimates establish an empirical sampling distribution for every indirect effect and the study derives a 95 percent confidence interval through the percentile method using the 2.5th and 97.5th percentiles. An indirect effect reaches statistical significance when its 95 percent confidence interval excludes zero.

Table 4.8 Bootstrap Test of the Indirect Effect through Media Exposure

Path	Bootstrap Mean	Bootstrap SD	CI95 Lower	CI95 Upper	Empirical p	Significant (5%)
E	-0.0431	0.0521	-0.1661	0.0439	0.3320	No
S	-0.0898	0.0856	-0.3038	0.0247	0.1736	No
G	-0.1397	0.0955	-0.3437	0.0236	0.0948	No

Table 4.8 presents the bootstrap results. For all three disclosure dimensions, the 95 percent bootstrap confidence interval includes zero: Environmental (95% CI - 0.1661 to 0.0439), Social (95% CI -0.3038 to 0.0247), and Governance (95% CI - 0.3437 to 0.0236). Accordingly, none of the indirect effects is statistically significant

at the five percent level, with empirical p-values of 0.3320, 0.1736, and 0.0948 for Environmental, Social, and Governance disclosure, respectively. These results are fully consistent with the Sobel test reported in Table 4.7: media exposure does not mediate the relationship between any ESG disclosure dimension and sales growth. The bootstrap analysis therefore confirms, under a more flexible and assumption-free inference procedure, that the mediation proposition of this study is not empirically supported.

4.7 Summary of Hypothesis Testing

Table 4.8 consolidates the results of all seven hypothesis tests.

Table 4.8 Summary of Hypothesis Testing Results

Hypothesis	Statement	Coefficient	p-value	Result
H1	Environmental disclosure positively influences sales growth	-0.0796	0.6009	Not supported
H2	Social disclosure positively influences sales growth	0.2517	0.6579	Not supported
H3	Governance disclosure positively influences sales growth	-0.1010	0.7249	Not supported
H4	Environmental disclosure positively influences media exposure	0.0657	0.8450	Not supported
H5	Social disclosure positively influences media exposure	1.0250	0.0156	Supported
H6	Governance disclosure positively influences media exposure	1.0783	0.0486	Supported
H7	Media exposure positively influences sales growth	-0.1479	0.0633	Not supported

Source: Data Processed by The Author (2026)

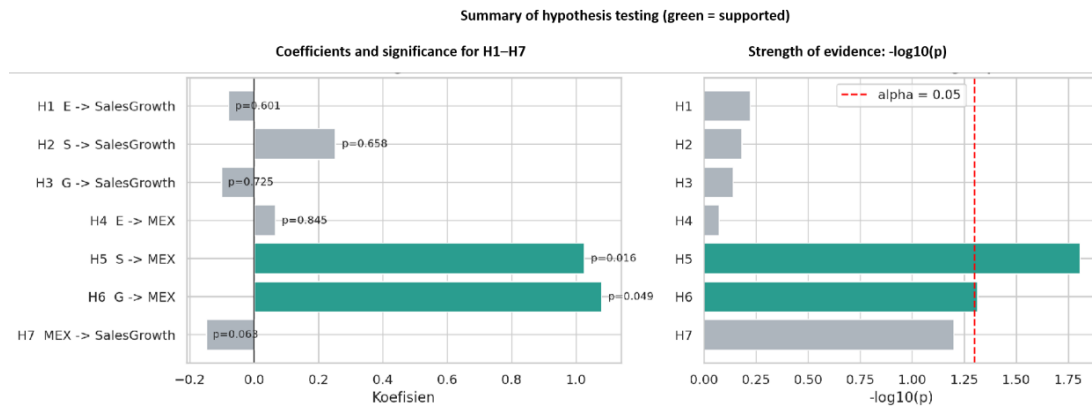


Figure 4.7 Visual Summary of Hypothesis Testing Results

Source: Data Processed by The Author (2026)

Figure 4.7 presents the same results graphically. The left panel reports the estimated coefficient and p-value for each hypothesis while the right panel displays the strength of statistical evidence through the negative base-ten logarithm of the p-value with the five percent significance level serving as the reference threshold. Only H5 and H6 exceed this benchmark which means that two of the seven hypotheses proposed in Section 2.6 receive empirical support while the remaining five do not.

The findings present a clear pattern across the proposed research model. ESG disclosure within Indonesia's energy and mining sector can generate media attention but this visibility does not translate into measurable market outcomes. The initial stage of the proposed mechanism therefore operates as expected whereas the subsequent stage fails to produce the anticipated effect.

4.8 Discussion

4.8.1 Summary of Hypothesis Testing Results

This section reviews the outcome of each of the seven hypotheses formulated in Section 2.6 in turn, situating each result against the rationale and prior studies cited at the point each hypothesis was developed.

H1, H2, and H3 (the direct effects of E, S, and G disclosure on sales growth) are not supported. None of the three disclosure dimensions has a statistically significant

relationship with sales growth, and the total-effect model explains less than one percent of its variation. ESG disclosure volume, on its own, bears no measurable relationship to commercial revenue performance in this sector.

H4 (Environmental disclosure positively influences media exposure) is not supported. The coefficient is positive but statistically indistinguishable from zero. One possible explanation is that environmental coverage in this sector is driven mainly by external events regulatory PROPER assessments, community disputes, and incident reporting rather than by the company's own disclosure, although this explanation is not directly tested with the available data.

H5 and H6 (Social and Governance disclosure positively influence media exposure) are supported. Both effects are positive, statistically significant, and economically large: a full-point improvement in either dimension is associated with roughly a doubling to tripling of ESG-related media coverage. This is the most robust result in the study and confirms that disclosure functions as usable, verifiable material for journalists.

H7 (Media exposure positively influences sales growth) is not supported. The estimated coefficient is negative and only marginally significant at the ten percent level, opposite in sign to the hypothesised direction.

4.8.2 ESG Disclosure Reaches the Media but Not the Market

The strongest result of this study shows that Social and Governance disclosure significantly increase Media Exposure. This finding supports the signalling mechanism discussed in Sections 2.1.2 and 2.4.1 because firms provide journalists with usable information when they disclose verifiable evidence concerning workforce composition occupational safety community programmes board supervision and anti-corruption practices. Greater disclosure gives news organisations stronger material for developing ESG-related stories and the magnitude of the relationship is substantial since a one-point increase in Social or Governance disclosure corresponds to an increase in coverage that approaches two or even three times the original volume. This pattern

remains consistent with Zhang Wei and Jiang (2023) who identify a clear association between corporate disclosure and media attention.

The absence of the second relationship represents the central contribution of this research. Media Exposure does not translate into higher Sales Growth because its estimated coefficient remains negative and only marginally different from zero. This result contrasts with Tran and Pham (2022) who report that ESG disclosure particularly Social disclosure can strengthen sales performance among global firms. Three main explanations can account for this difference and they are presented according to their relative explanatory importance.

4.8.3 The Business-to-Business Commodity Context

The first and most compelling explanation concerns the nature of the product market. Tran and Pham's global sample is weighted toward firms whose revenue depends on discretionary consumer purchasing, where brand reputation, perceived responsibility, and media narrative can plausibly shift demand. Indonesian energy and mining companies operate under fundamentally different commercial conditions. Their output consists of coal, nickel, tin, gas, and mining services sold to industrial buyers, smelters, utilities, and trading houses under long-term offtake agreements and contracts benchmarked to reference prices such as the Indonesian Coal Reference Price and London Metal Exchange quotations. Revenue in any given year is therefore determined overwhelmingly by contracted volume and prevailing commodity prices, neither of which responds to the volume of ESG articles published about the seller.

The descriptive evidence in Figure 4.1 corroborates this interpretation directly. Average sales growth traces the commodity cycle almost exactly, surging during the 2021-2022 price boom and contracting during the 2023-2024 normalisation, while average disclosure scores remain essentially flat throughout. A variable that does not move cannot explain a variable that swings by tens of percentage points annually. The near-zero R-squared of 0.0037 in Equation 1 is the formal expression of this mismatch.

4.8.4 The Valence Problem in Media Exposure Measurement

The second explanation concerns the measurement of the mediator. As specified in Section 3.3.2, media exposure is operationalised as a count of ESG-related articles. A count is valence-blind: an article reporting a new emissions-reduction target and an article reporting a tailings failure, a community protest, or a poor PROPER rating both increment the counter by one. In a sector that Section 3.2.1 identifies as carrying the highest environmental risk profile in Indonesia, a material share of ESG-related coverage is likely to be critical rather than celebratory. The negative sign on the path-b coefficient is consistent with a coverage stream in which unfavourable reporting is sufficiently prevalent to offset, and potentially outweigh, any reputational benefit from favourable reporting.

This interpretation is reinforced by the observation that media exposure rises steadily from 2023 onward, precisely the period in which average sales growth turns negative. While this co-movement is partly coincidental, in that both are driven by the commodity cycle, it is also consistent with the possibility that heightened scrutiny accompanies periods of operational and financial stress. The tone-coding robustness check anticipated in Section 3.3.2 would allow this proposition to be tested directly and represents the single most valuable extension of the present analysis.

4.8.5 Disclosure Credibility Revisited: A Possible, but Unverified, Explanation

The third explanation draws on the disclosure-credibility discussion in Section 2.4.3, which notes that the effectiveness of ESG disclosure as a signal depends on its perceived credibility. One possible reading of the insignificant and negatively signed mediating effect observed for all three dimensions is that stakeholders remain sceptical of corporate ESG disclosures, potentially because the disclosed information is perceived as compliance-oriented rather than substantive. This is offered as a plausible interpretation rather than a demonstrated finding, since greenwashing itself is not measured in this study.

Social disclosure averages 0.894 with a median of 1.000, meaning that most firm-years disclose every social indicator assessed. Such near-universal disclosure is difficult to reconcile with genuine variation in underlying social performance across 25 issuers of widely differing size, maturity, and operational complexity. A ceiling effect of this kind is more consistent with standardised, template-driven reporting produced to satisfy POJK No. 51/POJK.03/2017 than with differentiated substantive achievement, although this study did not independently verify reporting practices against underlying operational records, so this reading should be treated as a plausible interpretation of the descriptive pattern rather than a confirmed empirical finding. Where disclosure is uniformly high, it ceases to be a discriminating signal, and rational stakeholders will discount it accordingly.

Consistent with the caution in Section 2.4.3, however, these results should be interpreted as evidence that disclosure is not functioning as a credible commercial signal in this sample, not as proof that individual companies are engaged in deliberate greenwashing. This study measures disclosure and coverage; it does not independently verify ESG performance, and no firm-level greenwashing determination can be drawn from the data.

4.8.6 Comparison with Prior Indonesian Evidence

The findings closely correspond with Angela and Rusmanto (2025) who investigate ESG disclosure and Media Exposure among Indonesian firms and find that greater media attention produces a negative effect on firm value measured through price-to-book value. This study extends their evidence from a valuation-based outcome to an actual commercial measure represented by Sales Growth and identifies a similar direction. Within the Indonesian setting greater ESG-related media attention appears to associate with weaker market outcomes rather than improved performance. The consistency between these studies across different dependent variables samples and observation periods strengthens the argument that the negative association may reflect characteristics of Indonesia's information environment rather than a result specific to one research design.

The findings also confirm the disclosure-to-media relationship identified by Zhang Wei and Jiang (2023) while demonstrating that the commercial consequence examined in the present research does not emerge within this setting. The comparison with Tran and Pham (2022) further identifies an important boundary to their conclusions because the positive ESG-to-sales relationship observed in their global panel with substantial consumer-oriented firms does not appear to apply to a B2B commodity sector operating within an emerging market environment.

4.8.7 Theoretical Implications

The findings provide partial support for Signalling Theory because the transmission stage operates as predicted when corporate disclosure successfully reaches independent media intermediaries. The reception stage receives no comparable support because the transmitted information fails to generate a measurable commercial response. This pattern indicates that ESG signalling frameworks need to distinguish between signal transmission and signal reception while identifying the conditions that enable and motivate recipients to respond to the information received. Such motivation appears limited in markets where procurement teams make purchasing decisions through contracts that rely heavily on price benchmarks.

Stakeholder Theory and Legitimacy Theory continue to provide useful explanations for corporate disclosure decisions. Firms within this sector actively communicate ESG information and show particularly extensive disclosure across social and governance dimensions. The findings suggest that such reporting primarily serves regulatory and reputational legitimacy rather than direct commercial persuasion. Firms appear to maintain legitimacy among regulators financiers and licensing institutions instead of relying on customers to reward their sustainability communication which represents a coherent strategic approach despite the absence of a measurable sales effect.

CHAPTER V

CONCLUSION AND RECOMMENDATIONS

55.1 Conclusion

This study examined whether Environmental (E), Social (S), and Governance (G) disclosure influence the sales growth of Indonesian energy and mining companies listed on the IDX, and whether media exposure mediates this relationship. The analysis was based on a balanced panel of 125 firm-year observations drawn from 25 companies over the period 2021–2025. Based on the panel regression and Sobel mediation results reported in Chapter IV, the following conclusions are drawn with respect to each of the seven hypotheses.

In essence, the results show that ESG disclosure reaches the media but not the market: Social and Governance disclosure significantly increase media exposure (H5 and H6 supported), but none of the three disclosure dimensions has a significant direct effect on sales growth (H1–H3 not supported), media exposure does not in turn drive sales growth (H7 not supported), and Environmental disclosure does not significantly influence media exposure either (H4 not supported). The full hypothesis-by-hypothesis results, together with the supporting statistics and their interpretation, are presented in Section 4.8.1.

Consistent with these path-level results, the Sobel test finds no statistically significant indirect effect of Environmental, Social, or Governance disclosure on sales growth through media exposure. The mediation mechanism proposed in Section 2.7 is therefore not empirically supported: path a (disclosure → media exposure) holds for Social and Governance disclosure, but path b (media exposure → sales growth) does not hold, and a chain cannot transmit an effect through a broken link.

In summary, ESG disclosure in the Indonesian energy and mining sector succeeds in reaching independent media principally through its Social and Governance dimensions but this media exposure does not translate into sales growth. The

disclosure-to-media transmission stage of the proposed mechanism operates as theorised; the media-to-market reception stage does not.

5.2 Theoretical Implications

The findings provide three theoretical contributions. First, the results suggest that Signalling Theory (Spence, 1973) needs greater specification when researchers apply it to ESG disclosure because a signal may successfully reach an intermediary such as the media without reaching the ultimate audience whose behaviour the communication seeks to influence. Future ESG signalling models should separate transmission from reception and identify the conditions that make reception possible such as the buyer's capacity and willingness to respond to the information.

Second, the findings establish an important boundary for the sales-enhancing effect of ESG disclosure reported by Tran and Pham (2022). Their evidence comes from a global sample dominated by consumer-oriented firms and may not extend to B2B commodity markets in emerging economies where contracted quantities and reference prices exert greater influence on revenue than brand perceptions. The ESG-to-sales relationship therefore appears dependent on the structure of purchasing decisions which represents a contextual condition that broader international studies may not capture.

Third, the absence of a positive association between Media Exposure and Sales Growth indicates that greater ESG visibility does not automatically generate commercial value. The disclosure credibility argument discussed in Section 2.4.3 together with the concerns raised by Lee and Raschke (2023) provides one possible explanation for the limited effect of ESG communication on stakeholder trust but this study does not directly measure greenwashing. The results should therefore be interpreted as evidence that disclosure volume has limited value as a commercial signal rather than as proof of misleading corporate behaviour. When reporting focuses primarily on compliance instead of meaningful and distinctive sustainability practices the resulting media attention may fail to strengthen market confidence and could potentially weaken it as illustrated by the Volkswagen case discussed in Section 1.1.

Stakeholder Theory and Legitimacy Theory nevertheless remain relevant for explaining corporate disclosure decisions because firms in this sector provide substantial ESG information which suggests that reporting serves regulatory and financial stakeholder expectations more strongly than efforts to influence customers.

5.3 Practical Implications

For corporate managers and marketing or communication teams the findings indicate that firms should not treat greater ESG disclosure volume as a primary driver of commercial growth within B2B price-benchmarked segments such as energy and mining. ESG reporting remains important for regulatory compliance access to financing and stakeholder legitimacy but firms should allocate resources toward these objectives rather than assume that additional disclosure will produce higher sales.

For companies managing their media presence the significant relationship between disclosure and media coverage for Social and Governance information identifies these dimensions as the more dependable channels for generating ESG-related attention. Media visibility alone does not ensure favourable commercial results which makes the quality and tone of coverage important alongside its volume. This consideration becomes particularly relevant for Environmental disclosure because environmental news tends to follow external events and therefore remains less controllable through corporate communication.

For regulators such as OJK, the near-ceiling disclosure levels observed for Social information (mean 0.894, median 1.000) suggest that POJK No. 51/POJK.03/2017 has succeeded in producing widespread, standardised disclosure, but that this uniformity may leave firms and the market unable to distinguish differentiated, substantive ESG performance from template-driven compliance. Mechanisms that reward disclosure quality and verifiability, rather than checklist completeness alone, may be a useful complement to the current reporting mandate.

For investors and analysts, the results indicate that the volume of ESG-related media coverage a company receives is not a reliable proxy for future commercial

performance in this sector; sales growth in the sample is governed predominantly by the commodity price cycle rather than by disclosure or media activity.

5.4 Limitations of the Study

The limitations discussed in Section 3.11 need to be considered when interpreting the empirical findings presented in Chapter IV. Three issues carry particular importance for understanding the results. First, this study measures Media Exposure through the number of ESG-related news articles without distinguishing between favorable and unfavorable coverage. The negative coefficient on path b may indicate that adverse reporting contributes to the observed relationship but the available data cannot directly verify this explanation as discussed in Section 4.8.4. The measurement also depends on the article collection procedure because the study relies on Google News and a predetermined group of credible media outlets. Relevant reports from smaller or regional publications outside this selection may therefore remain unobserved which means the resulting figures may underestimate each firm's actual media visibility. Second, the regression models exclude commodity prices and firm size as control variables while the descriptive results in Section 4.1 indicate that Sales Growth may have responded strongly to the 2021–2022 commodity boom and the subsequent market normalization during 2023–2024. The omission of these factors may therefore affect the estimated relationships between the variables. Third, the five-year observation period represents only one commodity cycle and covers a relatively limited number of firms which reduces the ability of the models to identify smaller effects and limits the generalisability of the findings beyond Indonesia's energy and mining sector.

5.5 Recommendation for the Research

Tone-coded media exposure. Future studies should code each article's valence (favourable, unfavourable, or neutral) rather than counting coverage volume alone, directly testing whether unfavourable coverage is responsible for the negative path-b coefficient observed here.

Commodity price controls. Incorporating a commodity price index (e.g., the Indonesian Coal Reference Price or London Metal Exchange benchmarks) as a control variable would help isolate the effect of disclosure and media exposure from the effect of the price cycle identified in Section 4.8.3 as the dominant driver of sales growth in this sector.

Longer and multi-cycle panels. Extending the observation window to cover more than one commodity cycle would increase statistical power and allow the disclosure-sales relationship to be tested separately in boom and bust periods.

Cross-sector comparison. Testing the same model in a consumer-facing sector alongside the business-to-business energy and mining sector would allow the boundary condition proposed in Section 5.2 that the ESG-to-sales relationship depends on the buyer's purchasing structure to be tested directly rather than inferred.

Buyer-side qualitative research. Interviews with procurement or offtake decision-makers at industrial buyers would help establish whether, and under what conditions, ESG signals factor into business-to-business purchasing decisions at all.

Direct examination of greenwashing. Future research should directly examine greenwashing by comparing corporate ESG disclosure with independently verified ESG performance, for example through third-party ESG ratings, audited sustainability assurance reports, or regulatory compliance records (such as PROPER ratings). Such comparisons would allow the disclosure-credibility question raised in Section 2.4.3 to be tested directly at the firm level, rather than inferred from aggregate mediation patterns as in Section 4.8.5.

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