

Sustainability Disclosure Quality for Investment Attraction in Resource Extraction Firms: Field Study

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Abstract

The resource extraction sector occupies a highly contentious position in contemporary global economic systems, serving simultaneously as the foundational provider of raw materials necessary for the global energy transition and as a primary contributor to environmental degradation and carbon emissions. Consequently, firms operating within this sector face unprecedented pressure from stakeholders, particularly institutional investors, to provide comprehensive and high-quality sustainability disclosures. This paper presents a field study investigating the relationship between the quality of sustainability disclosures and subsequent investment attraction in resource extraction firms. Utilizing a mixed-methods approach that combines on-site field observations, interviews with corporate reporting officers, and quantitative analysis of financial and environmental data from a sample of global mining and energy corporations, this study explores how high-quality reporting mitigates information asymmetry. The research finds a robust positive association between substantive sustainability disclosures and institutional investment inflows, contrasting sharply with the negative investment reactions to superficial reporting or greenwashing. The findings suggest that investors utilize disclosure quality as a primary proxy for underlying managerial competence and risk mitigation capabilities. This study contributes to the literature on signaling theory and legitimacy theory by providing field-based empirical evidence on the capitalization of non-financial information in highly scrutinized industries.

Keywords: Sustainability Disclosure; Resource Extraction; Investment Attraction; Signaling Theory; Environmental Social Governance

1. Introduction

1.1 Background and Context

The global economic landscape has experienced a profound paradigm shift over the past two decades, characterized by an increasing integration of environmental, social, and governance considerations into mainstream financial decision-making. Nowhere is this shift more acutely felt than in the resource extraction industry, which encompasses mining, oil, gas, and large-scale forestry operations. These firms are inherently environmentally disruptive, frequently operating in ecologically sensitive regions and possessing massive carbon footprints. However, the paradox of the modern green transition is that the development of renewable energy infrastructure, electric vehicles, and advanced battery storage systems requires an unprecedented volume of extracted minerals such as lithium, cobalt, copper, and rare earth elements. As a result, resource extraction firms find themselves at the center of a complex web of stakeholder expectations. They are simultaneously demanded to increase production to meet the needs of the green transition while drastically reducing their operational environmental impacts and proving their commitment to long-term sustainability. In response to these contradictory pressures, corporate sustainability disclosures have emerged as the primary communicative mechanism through which these firms attempt to demonstrate their environmental stewardship, social responsibility, and overall corporate legitimacy to the external world [1].

Historically, sustainability reporting in the extraction sector was largely voluntary, narrative-driven, and often criticized for being little more than public relations exercises designed to deflect criticism. However, the landscape of non-financial reporting has matured significantly. Regulatory bodies, international standard-setting organizations, and industry consortia have introduced increasingly stringent frameworks intended to standardize and quantify environmental and social impacts. Despite these advancements, the quality, depth, and reliability of sustainability disclosures remain highly variable across the sector. Some firms provide highly granular, independently verified data regarding their greenhouse gas emissions, water usage, and community relations, while others continue to rely on boilerplate language and selective reporting that obscures underlying operational risks [2]. For institutional investors, who are increasingly mandated by their own stakeholders to decarbonize their portfolios and mitigate climate-related financial risks, distinguishing between substantive sustainability efforts and superficial greenwashing has become a critical component of capital allocation. Consequently, the quality of a firm's sustainability disclosure is no longer merely a matter of corporate communications; it has evolved into a fundamental determinant of cost of capital, valuation, and overall investment attraction.

1.2 Problem Statement and Objectives

Despite the growing consensus that sustainability matters, empirical evidence regarding the precise financial benefits of high-quality sustainability disclosures remains somewhat fragmented, particularly within the specific context of the resource extraction sector. Existing literature heavily relies on archival data and automated textual analysis of corporate reports, often failing to capture the internal organizational dynamics and the qualitative nuances that institutional investors evaluate during their due diligence processes. Furthermore, there is a pronounced gap in understanding how the quality of these disclosures—differentiated from the mere quantity or frequency of reporting—directly influences the decision-making calculus of institutional investors [3]. Many extraction firms invest substantial resources into producing voluminous sustainability reports, yet they struggle to attract the long-term, stable institutional capital required for capital-intensive transitions toward cleaner extraction technologies. This disconnect suggests that the mere presence of a sustainability report is insufficient; it is the underlying quality, verifiability, and strategic integration of the disclosed information that drives investment attraction.

Therefore, the primary objective of this paper is to conduct a comprehensive field study to unpack the mechanisms linking sustainability disclosure quality to investment attraction in resource extraction firms. Specifically, this study aims to achieve three interconnected goals. First, it seeks to develop a nuanced, field-informed metric for evaluating sustainability disclosure quality that moves beyond simple compliance checklists to assess the substantive strategic alignment of the reported data. Second, it endeavors to empirically test the relationship between this refined metric of disclosure quality and changes in institutional investment holdings over time. Third, by incorporating qualitative insights from field observations and interviews with corporate reporting officers, the study aims to illuminate the organizational challenges inherent in producing high-quality disclosures and the specific signals that investors extract from these reports. By bridging the gap between archival financial research and on-the-ground corporate realities, this research provides a holistic understanding of how non-financial information is capitalized in one of the global economy's most highly scrutinized sectors.

2. Literature Review and Theoretical Framework

2.1 Evolution of Sustainability Disclosures in Extractive Industries

The academic discourse surrounding corporate sustainability disclosures has evolved through several distinct phases, mirroring the broader societal shifts in environmental awareness and corporate accountability. Initially, the literature predominantly viewed environmental reporting through the lens of legitimacy theory, which posits that organizations continually seek to ensure that they operate within the bounds and norms of their respective societies. In the context of resource extraction, early studies suggested that firms utilized environmental disclosures primarily as reactive tools to repair their social license to operate following catastrophic environmental incidents, such as oil spills or mine tailings dam failures [4]. Under this paradigm, disclosures were often characterized by high volumes of positive narrative and a distinct lack of quantitative,

comparable data. Scholars noted that worse-performing firms sometimes produced lengthier environmental reports than their better-performing peers, a phenomenon driven by the urgent need to manage public perception rather than to provide useful information to financial markets.

As stakeholder demands matured and the financial implications of environmental risks became more apparent, the focus of both practice and literature shifted toward standardization and comparability. The introduction of frameworks by the Global Reporting Initiative and later the Sustainability Accounting Standards Board catalyzed a transition from purely narrative reporting to the inclusion of specific, industry-relevant metrics [5]. In the resource extraction sector, this meant a heightened focus on quantifiable indicators such as scope emissions, water consumption in water-stressed regions, and specific occupational health and safety metrics. Literature from this transitional period began to differentiate between the quantity of disclosure and the quality of disclosure, defining quality in terms of relevance, reliability, and comparability [6]. Researchers observed that while the adoption of standardized frameworks improved the baseline of reporting, significant heterogeneity in disclosure quality persisted, often driven by differing national regulatory environments, varying levels of board-level commitment to sustainability, and the relative visibility of the firm to international non-governmental organizations.

More recently, the literature has increasingly focused on the concept of financial materiality in sustainability reporting. This perspective argues that high-quality sustainability disclosures are those that provide investors with the information necessary to assess how environmental and social issues impact the firm's financial condition, operating performance, and risk profile [7]. In the extractive sector, where stranded asset risks and carbon pricing mechanisms pose existential threats to certain business models, the financial materiality of sustainability data is undeniable. Contemporary research emphasizes the importance of integrated reporting, where sustainability metrics are not siloed in a separate document but are discussed in tandem with strategic financial planning and core risk management processes. However, despite these advancements in the theoretical understanding of disclosure quality, empirical methodologies for accurately capturing and scoring this quality remain heavily debated, necessitating the field-based approach adopted in this current study to capture the nuances of substantive versus symbolic reporting [8].

2.2 Investment Attraction Mechanisms and Theoretical Underpinnings

To understand why high-quality sustainability disclosures attract investment, it is necessary to integrate insights from signaling theory and information asymmetry literature. In the capital markets, managers possess superior information regarding the firm's true environmental liabilities, transition strategies, and long-term sustainability prospects compared to outside investors. This information asymmetry creates a fundamental adverse selection problem. Investors, unable to perfectly differentiate between firms with robust, sustainable business models and those with hidden environmental risks, may discount the valuation of all firms in the sector, leading to a higher cost of capital across the board. Signaling theory posits that high-quality firms can overcome this adverse selection problem by sending costly, observable signals to the market that low-quality firms cannot easily mimic.

In the context of this study, high-quality sustainability disclosure functions as precisely this type of signal. Producing highly granular, independently verified, and strategically integrated sustainability reports requires significant internal data collection capabilities, robust governance structures, and actual substantive performance [9]. A firm engaged in greenwashing or possessing poor environmental performance would find it prohibitively costly or impossible to produce a disclosure of equivalent quality without exposing itself to significant reputational and legal risks associated with fraudulent reporting. Therefore, when institutional investors observe a high-quality sustainability disclosure, they interpret it not merely as a reflection of good environmental performance, but as a broader signal of superior managerial competence, robust internal control systems, and lower overall operational risk [10]. This reduced perception of risk directly translates into a lower required rate of return and an increased willingness to allocate capital to the firm.

Furthermore, the mechanisms of investment attraction are also driven by the changing structural constraints of institutional investors themselves. Pension funds, sovereign wealth funds, and large asset managers are increasingly subject to environmental mandates from their beneficiaries and regulatory bodies. These institutions require high-quality, standardized data to calculate the aggregate carbon intensity of their portfolios,

to comply with sustainable finance disclosure regulations, and to justify their capital allocation decisions to their own stakeholders [11]. When a resource extraction firm provides high-quality disclosure, it essentially lowers the information processing costs for these institutional investors, making the firm a more attractive target for inclusion in globally diversified, ESG-tilted portfolios. The combination of these two mechanisms—the signaling of managerial quality and the reduction of information processing costs for mandated investors—forms the theoretical foundation for the expectation that superior disclosure quality will drive quantifiable investment attraction.

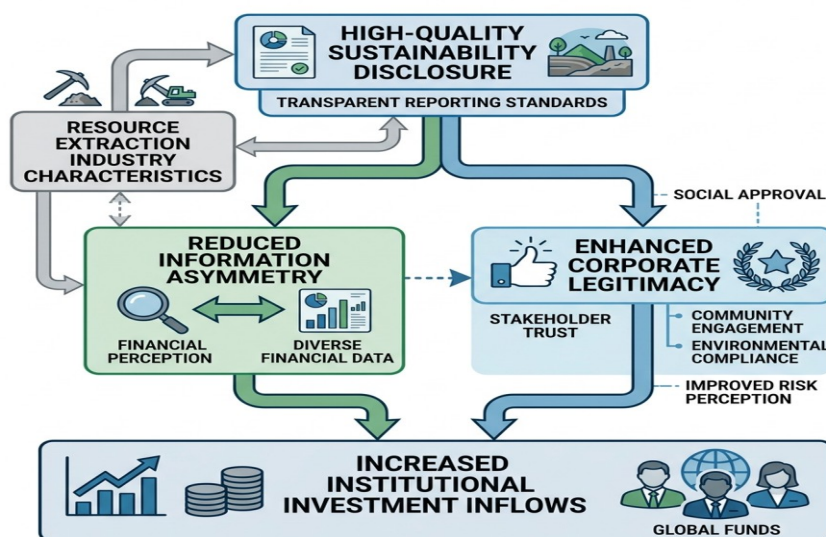


Figure 1: Theoretical Framework of Sustainability Disclosure Quality and Investment Attraction

3. Methodology and Research Design

3.1 Field Study Design and Sample Selection

This research employs a rigorous mixed-methods field study design to capture both the qualitative organizational dynamics of sustainability reporting and the quantitative financial outcomes of these disclosures. The methodology departs from traditional archival studies by integrating on-the-ground observations and primary data collection with secondary financial databases. The population of interest comprises publicly traded corporations operating within the global resource extraction sector, specifically focusing on industrial metals mining, precious metals mining, and oil and gas exploration and production. To construct a representative and manageable sample for the field study component, a stratified random sampling approach was utilized. The population was stratified based on geographic headquarters, market capitalization, and specific extraction sub-industry. From this stratified population, a final sample of sixty-five multinational resource extraction firms was selected for deep-dive analysis over a consecutive five-year observation period.

The qualitative component of the field study involved direct engagement with the selected firms. Over a period of eighteen months, structured interviews were conducted with corporate reporting officers, chief sustainability officers, and investor relations directors at thirty of the sixty-five sample firms who agreed to participate in the primary data collection phase. These interviews were designed to elicit information regarding the internal processes of data aggregation, the influence of board-level oversight on reporting quality, and the perceived pressures from institutional investors. Furthermore, field observations were conducted at a subset of operational sites to verify the alignment between the corporate narratives presented in sustainability reports and the actual environmental management systems implemented on the ground. This primary data was instrumental in developing a highly nuanced understanding of the divergence between symbolic reporting and substantive sustainability integration [12].

The quantitative component of the study utilized the full sample of sixty-five firms over the five-year period, resulting in a panel dataset of three hundred and twenty-five firm-year observations. Secondary financial and

ownership data were extracted from leading global financial databases, while the sustainability reports, annual reports, and proxy statements of the sample firms were manually collected from corporate websites and regulatory filings. The integration of qualitative insights from the field with robust panel data allows for a more accurate specification of the econometric models and a richer interpretation of the empirical findings, mitigating the common critique that sustainability research relies too heavily on automated, superficial metrics.

3.2 Data Collection and Variable Measurement

The dependent variable in this study, Investment Attraction, is operationalized as the net change in institutional ownership over the fiscal year following the publication of the annual sustainability disclosure. Institutional ownership data, specifically the percentage of outstanding shares held by mutual funds, pension funds, and other institutional asset managers, provides a precise metric of sophisticated capital allocation. By measuring the change in institutional ownership rather than absolute levels, the study isolates the marginal impact of the new information provided in the annual disclosure cycle, controlling for historical holding patterns [13].

The primary independent variable, Sustainability Disclosure Quality, was measured using a bespoke, field-informed scoring matrix developed specifically for this study. Unlike off-the-shelf ESG ratings provided by commercial data vendors, which often suffer from methodological opacity and aggregation biases, the scoring matrix utilized here is grounded in the qualitative findings of the field study phase. The matrix evaluates disclosures across four distinct dimensions: Quantitative Comparability, Strategic Integration, Independent Verification, and Forward-Looking Targets. Each firm's annual suite of reports was manually coded by a team of trained research assistants using a standardized rubric. A high score on this index requires not only the presence of relevant environmental data but also evidence that this data is integrated into the firm's capital expenditure planning, that it has been assured by a credible third-party auditor, and that it is linked to specific, time-bound management remuneration targets [14].

To isolate the specific effect of disclosure quality on investment attraction, it is crucial to control for a range of firm-specific financial and operational characteristics that simultaneously influence both reporting capabilities and investor preferences. The control variables include Firm Size, measured by the natural logarithm of total assets; Financial Leverage, calculated as total debt divided by total equity; Return on Assets, acting as a proxy for baseline operational profitability; and Revenue Growth, capturing the growth trajectory of the firm. Furthermore, a variable capturing the baseline Carbon Intensity of the firm's operations was included, as investors may react differently to disclosures depending on the absolute level of environmental risk inherent in the firm's specific asset portfolio. Industry and year fixed effects are also incorporated to control for macroeconomic shocks, commodity price cycles, and broad sub-industry trends that could spuriously drive both disclosure practices and capital flows.

Table 1: Variable Definitions and Measurement Approaches

Variable Category	Variable Name	Measurement Description	Data Source
Dependent	Institutional Investment Change	Year-over-year percentage point change in total shares held by institutional investors	Financial Databases
Independent	Disclosure Quality Score	Composite index based on content analysis of reporting (Scale 1 to 100)	Manual Coding / Corporate Reports
Control	Firm Size	Natural logarithm of total corporate assets in USD	Financial Databases
Control	Leverage Ratio	Total long-term and short-term debt scaled by total shareholder equity	Financial Databases
Control	Return on Assets	Net income divided by total assets	Financial Databases
Control	Carbon Intensity	Total scope one and two emissions scaled by total revenue	Corporate Reports

4. Empirical Analysis and Findings

4.1 Descriptive Statistics and Preliminary Trends

The analysis of the descriptive statistics reveals several compelling patterns regarding the state of sustainability disclosure within the resource extraction sector. The Sustainability Disclosure Quality score exhibits significant variance across the sample, with a mean score indicating that while most firms have moved beyond basic narrative reporting, true strategic integration and independent verification remain elusive for a substantial portion of the industry. Disaggregating the disclosure scores by geographic region highlights a pronounced regulatory effect; firms headquartered in European jurisdictions consistently display higher average disclosure quality scores compared to their North American and emerging market peers. This geographic divergence is largely attributable to the earlier implementation of stringent non-financial reporting directives within the European Union, which forced extraction firms in those jurisdictions to develop robust internal data gathering and verification mechanisms earlier than their global competitors.

Furthermore, an initial correlational analysis indicates a positive, albeit unconditional, relationship between the disclosure quality score and the baseline profitability metrics of the firms. This observation aligns with the slack resources hypothesis, which suggests that more profitable firms possess the discretionary financial and human capital necessary to invest in high-quality sustainability reporting systems. However, the qualitative insights from the field study complicate this simple narrative. Interviews with reporting officers revealed that in several instances, firms experiencing significant operational challenges or declining commodity prices paradoxically increased their investment in disclosure quality. In these cases, managers viewed enhanced transparency as a critical strategic tool to maintain investor trust and secure continued access to debt and equity markets during periods of operational distress. This nuanced reality underscores the necessity of employing robust multivariate econometric techniques to disentangle the causal pathways linking disclosure quality to investment attraction, controlling for underlying financial performance.

An examination of the dependent variable, the change in institutional investment, also demonstrates considerable volatility over the five-year observation period. The data reveals distinct periods of capital flight from the most carbon-intensive sub-sectors, particularly thermal coal extraction, coinciding with major global climate summits and shifts in international environmental policy. Conversely, firms involved in the extraction of transition minerals, such as lithium and copper, experienced aggregate inflows of institutional capital. Within these broader macroeconomic and sector-specific trends, the crucial analytical task is to determine whether individual firm-level variations in disclosure quality provide a statistically significant explanatory factor for the observed differences in capital allocation among firms operating within the same sub-industries and facing identical macro-environmental pressures.

Table 2: Descriptive Statistics for Key Study Variables

Variable	Mean	Standard Deviation	Minimum	Maximum
Institutional Investment Change	1.25	4.30	-15.40	18.75
Disclosure Quality Score	62.40	18.15	22.00	95.50
Firm Size	9.85	1.45	6.20	13.10
Leverage Ratio	0.45	0.22	0.05	1.35
Return on Assets	0.08	0.06	-0.12	0.25
Carbon Intensity	450.20	310.50	85.00	1450.00

4.2 Main Regression Outcomes

To rigorously test the primary research hypothesis, a series of multivariate panel data regression models were estimated. The baseline model utilized ordinary least squares with firm-clustered standard errors to account for potential serial correlation within the individual firm observations across the five-year period. Following standard econometric practices for panel data, subsequent models incorporated firm fixed effects to control for time-invariant, unobservable corporate characteristics, such as entrenched organizational culture or historical geographical asset positioning, which might simultaneously influence both disclosure behavior and investor attractiveness [15]. Time fixed effects were also included in all models to absorb common macroeconomic shocks, such as fluctuations in global commodity prices or broad shifts in international monetary policy that affect the entire extraction sector simultaneously.

The results of the primary regression analysis provide strong, statistically significant evidence supporting the core hypothesis. The coefficient for the Sustainability Disclosure Quality variable is positive and highly significant across all model specifications. In practical terms, the model estimates that a one standard deviation improvement in the disclosure quality score is associated with a proportional increase in net institutional investment over the subsequent fiscal year, holding all other financial and operational variables constant. This finding confirms that institutional investors actively utilize the qualitative aspects of sustainability reports—specifically the presence of verifiable data, strategic integration, and forward-looking targets—as critical inputs in their capital allocation decisions. The market does not merely reward the existence of a disclosure document; it specifically prices the depth, reliability, and strategic relevance of the information contained within it.

Further nuanced findings emerge when interacting the disclosure quality score with the baseline carbon intensity of the firm. The interaction term reveals that the positive impact of high-quality disclosure on investment attraction is significantly amplified for firms with higher absolute levels of baseline carbon intensity. This suggests that for the most environmentally problematic firms within the extraction sector, transparency is arguably the most valuable tool available for maintaining investor relations. When high-polluting firms provide highly detailed, credible roadmaps for transition and risk management, investors respond more positively than they do to similar disclosures from firms with naturally lower environmental footprints. This dynamic strongly supports the signaling theory interpretation: for high-risk firms, producing a high-quality disclosure acts as a particularly powerful and costly signal of managerial competence and commitment to structural transformation, thereby significantly reducing the adverse selection risk for institutional capital allocators.

5. Discussion and Implications

5.1 Interpretation of Key Results

The empirical findings of this field study offer a substantial contribution to the ongoing academic and practical debates regarding the financial materiality of sustainability reporting in contentious industries. The robust positive association between disclosure quality and institutional investment attraction challenges the cynical view that corporate environmental reporting in the extraction sector is entirely relegated to the realm of ineffective public relations. Instead, the data demonstrates that sophisticated capital markets possess the analytical capacity to look past boilerplate narratives and reward firms that engage in substantive, verifiable, and strategically integrated transparency. The field study component was critical in illuminating why this occurs; institutional investors, constrained by their own fiduciary duties and environmental mandates, heavily discount superficial reporting but actively utilize high-quality data to model long-term cash flow risks associated with carbon pricing, resource scarcity, and potential stranded assets.

The finding that the value of disclosure quality is magnified for firms with the highest baseline environmental impact provides profound validation for signaling theory in modern capital markets. It indicates that investors do not necessarily expect resource extraction firms to transform into zero-impact entities overnight, an operational impossibility. Rather, investors demand credible, high-fidelity information regarding how management is navigating the transition risk. A high-quality disclosure serves as a proxy for high-quality management. When a highly carbon-intensive firm successfully produces an independently verified, financially integrated sustainability report, it signals to the market that internal governance structures are functioning effectively, that data collection systems are robust, and that the executive team is actively managing, rather than ignoring, existential environmental risks [16]. Consequently, the reduction in information asymmetry leads directly to a lower perceived risk profile and increased investment attraction.

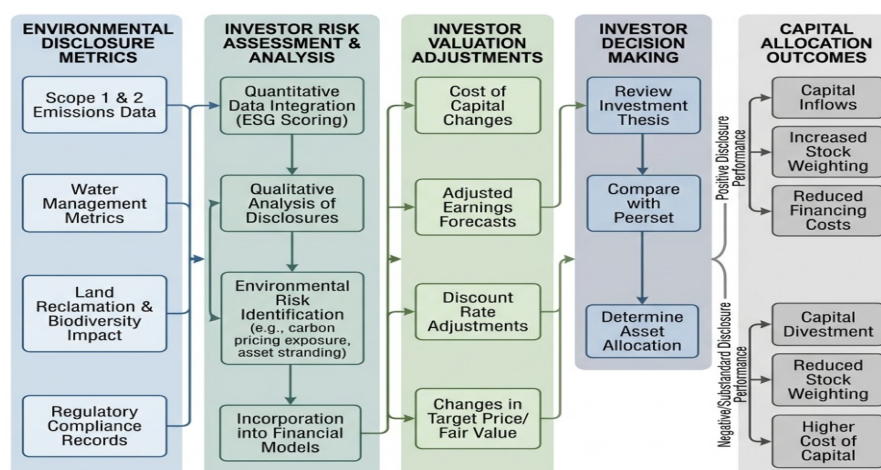


Figure 2: Empirical Mechanism of Disclosure Impact on Investor Decision Making

5.2 Policy and Managerial Implications

The implications of this research are highly relevant for both corporate managers within the resource extraction sector and international regulatory bodies. For corporate executives, the study provides clear empirical evidence that investments in internal sustainability data infrastructure, third-party assurance processes, and integrated reporting frameworks are not merely sunk compliance costs but represent strategic investments with quantifiable returns in the capital markets. Managers must recognize that producing a voluminous but superficial sustainability report may actually be detrimental, as sophisticated investors rapidly identify and discount greenwashing efforts. To maximize investment attraction, extraction firms must shift their focus from the quantity of narrative output to the quality, comparability, and strategic relevance of their environmental data, ensuring that sustainability metrics are treated with the same rigor and board-level oversight as traditional financial accounting figures.

From a public policy and regulatory perspective, the findings strongly support the current global trajectory toward mandatory, standardized sustainability reporting frameworks. The observed heterogeneity in disclosure quality and its significant impact on capital allocation highlights the market inefficiencies created by voluntary, unstandardized reporting regimes. When disclosure quality varies wildly, information processing costs for investors remain high, and capital may not flow efficiently toward the firms genuinely leading the transition to more sustainable operational models. Regulators should focus on enforcing standardized, quantifiable metrics specific to the extraction industry, and crucially, mandate the independent third-party verification of critical environmental data. By leveling the informational playing field, regulators can facilitate more efficient capital markets that accurately price environmental risks and reward genuine corporate sustainability efforts in globally critical industries.

6. Conclusion and Limitations

6.1 Summary of Contributions

This paper has presented a comprehensive field study investigating the critical nexus between sustainability disclosure quality and investment attraction within the globally significant resource extraction sector. By moving beyond simple binary measures of disclosure presence and developing a nuanced, field-informed metric of reporting quality, this study has successfully isolated the financial market's reaction to substantive versus symbolic transparency. The integration of qualitative field observations with rigorous panel data econometrics has demonstrated a robust, positive, and statistically significant relationship between the quality of sustainability disclosures and subsequent increases in institutional capital allocation. Furthermore, the research highlighted that this relationship is particularly pronounced for firms with higher baseline environmental footprints, providing strong empirical validation for signaling theory in the context of

contemporary environmental risk management. Ultimately, the study confirms that high-quality sustainability reporting acts as a vital mechanism for reducing information asymmetry, signaling managerial competence, and securing long-term capital in an industry facing unprecedented transition pressures.

6.2 Limitations and Avenues for Future Research

While this study offers significant contributions, it is necessary to acknowledge certain methodological limitations that provide avenues for future academic inquiry. Firstly, despite employing a rigorous stratified sampling technique, the field study component was inherently limited to a specific subset of sixty-five multinational resource extraction firms. The findings may not be entirely generalizable to smaller, domestically focused extraction companies or state-owned enterprises, which face entirely different capital constraints and stakeholder pressures. Secondly, the bespoke disclosure quality scoring matrix, while deeply informed by extensive field interviews, inherently relies on a degree of subjective researcher judgment during the manual coding process. Future research could focus on developing advanced natural language processing algorithms capable of automatically identifying and weighting the substantive, strategically integrated elements of disclosures at a much larger scale. Finally, while the study establishes a clear link between disclosure quality and investment attraction, future longitudinal research should investigate the ultimate real-world environmental outcomes of these capital flows, examining whether firms that successfully attract capital through high-quality reporting subsequently utilize that capital to achieve measurable reductions in their environmental impacts over the long term.

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