

Article

When Authenticity Doesn't Pay: Validating an ESG Communication Authenticity Framework and Explaining Stakeholder–Investor Decoupling

Yiu-Fai Chan ^{1,*}, Lawrence M. Ngoe ² , Moshood Olatunde Oladapo ³, Godswill Osemeke ²  and Imran Akhtar ² 

¹ International Foundation Year, Salford Languages, University of Salford, Maxwell Building, Salford M5 4WT, UK

² Business Management and MRes Leadership and Strategy, Greater Manchester Business School, University of Greater Manchester, Great Moor Street, Bolton BL1 1SW, UK; l.ngoe@greatermanchester.ac.uk (L.M.N.); g.osemeke@greatermanchester.ac.uk (G.O.); i.akhtar@greatermanchester.ac.uk (I.A.)

³ School of Leadership, Marketing and Management, Faculty of Business and Law, De Montfort University, Dubai Internet City, Building 12, Dubai 501870, United Arab Emirates; moshood.oladapo@dmu.ac.uk

* Correspondence: y.f.chan@salford.ac.uk

Abstract

Environmental, Social, and Governance (ESG) communications have proliferated across Fortune 500 companies, yet no validated frameworks exist for systematically distinguishing authentic from superficial positioning. This study develops and validates the Dynamic Authenticity Evaluation Model (DAEM), measuring three interactive dimensions of ESG communication authenticity: operational alignment, temporal consistency, and communication specificity. Through dual-evaluator protocols applied to eight mega-cap companies, DAEM achieves excellent inter-rater reliability (ICC = 0.85; Krippendorff's $\alpha = 0.83$). An event study analysis across sixteen major ESG announcements reveals no significant correlation between communication authenticity and abnormal stock returns ($r = 0.289$; $p = 0.491$), with effects being bounded below $\pm 0.30\%$ cumulative abnormal returns through equivalence testing. Preliminary stakeholder analysis suggests differential authenticity sensitivity, with employee engagement showing a stronger association with DAEM scores ($r = 0.423$) than market reactions ($r = 0.289$). Results indicate that authentic ESG communications influence non-market stakeholders more than short-term stock prices, suggesting that market value creation requires operational rather than symbolic approaches, while authentic communication remains important for stakeholder relationship management.

Keywords: ESG communication; authenticity measurement; stakeholder theory; market efficiency; framework validation; stakeholder–investor decoupling



Academic Editor: Ting Chi

Received: 6 September 2025

Revised: 2 October 2025

Accepted: 6 October 2025

Published: 8 October 2025

Citation: Chan, Y.-F.; Ngoe, L.M.; Oladapo, M.O.; Osemeke, G.; Akhtar, I. When Authenticity Doesn't Pay:

Validating an ESG Communication Authenticity Framework and Explaining Stakeholder–Investor Decoupling. *Sustainability* **2025**, *17*, 8922. <https://doi.org/10.3390/su17198922>

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The exponential growth of Environmental, Social, and Governance (ESG) communications across Fortune 500 companies over the past decade has created pressing measurement challenges, with profound implications for stakeholder capitalism theory. While more than 90% of S&P 500 companies now publish comprehensive ESG communications, the absence of validated frameworks for systematically distinguishing authentic from superficial positioning prevents rigorous testing of fundamental assumptions about authenticity–market relationships [1]. This measurement gap constitutes a critical obstacle to advancing a theoretical understanding of how corporate communication quality affects stakeholder relationships and organizational performance.

This research aligns with *Sustainability*'s interdisciplinary scope by bridging corporate strategy, stakeholder management, and sustainable development measurement. The DAEM framework addresses calls for better ESG accountability tools, while the stakeholder–investor decoupling findings inform sustainable business strategy development. The methodology advances measurement science for sustainability research requiring intensive assessment approaches.

Current ESG research faces fundamental measurement limitations, preventing definitive conclusions about the effects of communication authenticity. Existing approaches focus on disclosure quantity, compliance with reporting standards, or aggregate commercial ESG ratings while neglecting the communicative quality and perceived authenticity that stakeholder theory suggests should drive stakeholder responses [2]. This oversight is problematic given evidence that stakeholders possess sophisticated capabilities for distinguishing authentic from inauthentic corporate communications [3].

Existing ESG rating disagreements exemplify these challenges, with correlations between major agencies (MSCI, Sustainalytics, Refinitiv) ranging from 0.14 to 0.65, reflecting deeper conceptual disagreements about meaningful ESG assessment rather than technical measurement issues [1]. These disagreements stem from scope definition, methodology, and weighting differences, suggesting fundamental conceptual rather than purely technical challenges that validated authenticity measurement frameworks could address.

Recent scholarly attention has increasingly focused on the disconnect between widespread ESG disclosure adoption and persistent questions about corporate commitment authenticity. While stakeholder theory predicts that authentic ESG positioning should enhance stakeholder relationships and organizational performance, the empirical evidence remains mixed due to measurement limitations that prevent systematic authenticity assessment [4,5]. Concurrent developments in signaling theory suggest that the quality of communication, not just quantity, determines stakeholder responses to corporate ESG initiatives [6,7]. However, legitimacy theory warns that superficial positioning may backfire when stakeholders detect inauthenticity [8,9]. These theoretical tensions remain unresolved due to the absence of validated frameworks for systematically distinguishing authentic from superficial ESG communication strategies.

This study makes three primary contributions. First, we establish the first validated framework for systematic ESG communication authenticity measurement, achieving superior reliability ($ICC = 0.85$) compared to existing ESG rating approaches, which show correlations between agencies of only 0.14–0.65 [10]. Second, we provide bounded evidence of stakeholder–investor decoupling, demonstrating through equivalence testing that authentic ESG positioning's effects on stock returns are economically negligible while showing directional evidence for stronger non-market stakeholder sensitivity. Third, we contribute to efficient market theory by showing that sophisticated financial markets may efficiently recognize communication–action gaps, pricing operational substance while remaining unmoved by communication quality alone.

2. Literature Review and Theoretical Development

2.1. The ESG Measurement Crisis: From Quantity to Quality Concerns

Contemporary ESG research confronts a measurement crisis that undermines its theoretical advancement and practical application. This crisis manifests through three interconnected problems that existing approaches fail to address systematically, as illustrated in Table 1's comparison of current measurement frameworks.

Table 1. DAEM vs. existing measurement approaches.

Approach	Focus	Dimensions	Reliability	Theoretical Basis	Market Application	Key Limitation Addressed	DAEM Innovation
ESG Ratings (MSCI, etc.)	Performance scores	Multiple varied	$r = 0.14\text{--}0.65$	Mixed	Widespread	Outcome measurement, not communication quality	Communication authenticity vs. performance outcomes
Disclosure Quality	Quantity/compliance	Information breadth	Variable	Disclosure theory	Limited	Volume metrics miss credibility signals	Quality assessment vs. quantity metrics
CSR Authenticity Scales	Consumer perceptions	Brand-specific	$r = 0.70\text{--}0.85$	Consumer behavior	Marketing only	Single-stakeholder focus	Cross-stakeholder application via theoretical integration
DAEM	Communication authenticity	3 interactive	ICC = 0.85	Multi-theoretical	Cross-stakeholder	Systematic authenticity assessment	Interactive modeling capturing stakeholder evaluation processes

Source: the authors.

The DAEM advances beyond existing frameworks through three key innovations: (1) interactive dimensional modeling replacing the additive metrics used in CSR scales, enabling capture of multiplicative authenticity effects; (2) a focus on communication quality, distinguishing it from ESG ratings measuring performance outcomes; (3) multi-theoretical grounding, enabling cross-stakeholder application beyond single-context brand perception measures. The framework addresses the critical measurement gap where existing approaches cannot systematically assess communication authenticity across diverse stakeholder groups.

Problem 1: Measurement–Theory Disconnection. As Table 1 demonstrates, current ESG measurement approaches focus primarily on disclosure quantity and compliance metrics while neglecting the communication authenticity constructs that stakeholder, signaling, and legitimacy theories identify as critical for stakeholder response prediction [2,4,11]. Traditional ESG ratings examine “performance scores” and disclosure quality measures’ “information breadth,” yet neither captures the credibility signals and perceived authenticity that theoretical frameworks suggest should drive stakeholder responses [12,13]. This creates a fundamental theory–practice gap, where measurement tools cannot test core theoretical propositions about authentic stakeholder engagement.

Problem 2: Commercial Rating Inadequacy. The substantial disagreements between commercial ESG rating agencies shown in Table 1 (correlations: 0.14–0.65) reflect deeper conceptual failures in capturing stakeholder evaluation processes rather than technical measurement challenges [10]. These disagreements suggest that current approaches may be measuring the wrong constructs entirely, focusing on compliance rather than credibility. The variable reliability across existing approaches indicates fundamental methodological inconsistencies that prevent systematic theoretical testing.

Problem 3: Authenticity Assessment Absence. Table 1 reveals that no existing frameworks systematically measure the operational alignment, temporal consistency, and communication specificity that consumer behavior research demonstrates stakeholders use to distinguish authentic from inauthentic corporate positioning [3,14,15]. CSR authenticity scales focus narrowly on “brand-specific” consumer perceptions with limited “marketing-only” applications, while ESG ratings and disclosure quality measures ignore authenticity constructs entirely. This absence prevents empirical testing of authenticity–outcome relationships across stakeholder groups.

Synthesis: The Need for Authenticity-Focused Measurement. These three problems converge to create an urgent need for theoretically grounded, empirically validated frameworks that can systematically assess the authenticity of ESG communication while enabling rigorous testing of stakeholder capitalism predictions. Table 1’s final row shows how the DAEM addresses these convergent problems through “multi-theoretical” foundations, superior reliability (ICC = 0.85), and “cross-stakeholder” applications that existing approaches cannot

provide. The DAEM represents a fundamental methodological innovation rather than an incremental improvement to existing measurement systems.

2.2. *Dynamic Authenticity Evaluation Model (DAEM): Theoretical Innovation and Methodological Advancement*

Rather than developing another ESG rating system, the DAEM represents a fundamental methodological innovation that addresses the measurement–theory disconnection identified above. This section presents the DAEM’s theoretical foundations and novel measurement approach, highlighting three key innovations that distinguish it from existing frameworks.

Innovation 1: Multi-Theoretical Integration. The DAEM uniquely integrates stakeholder, signaling, and legitimacy theories through multiplicative rather than additive relationships, capturing the complex cognitive processes that stakeholders use for authenticity evaluation that single-theory approaches miss.

Innovation 2: Interactive Authenticity Modeling. Unlike existing approaches that treat ESG dimensions independently, the DAEM models authenticity as emerging through interactions between operational alignment, temporal consistency, and communication specificity, reflecting empirical evidence about holistic stakeholder evaluation processes.

Innovation 3: Communication–Operation Distinction. The DAEM systematically separates communication authenticity from operational performance, enabling empirical testing of whether stakeholders respond to “what companies say” vs. “what companies do”—a critical distinction for understanding ESG value creation mechanisms.

2.2.1. Multi-Theoretical Integration

The DAEM integrates stakeholder theory, signaling theory, and legitimacy theory to explain ESG authenticity assessment as an ongoing cognitive process involving interactive evaluation mechanisms [16]. This integration addresses single-theory limitations that may miss important stakeholder evaluation aspects across different contexts.

Stakeholder Theory Integration: Freeman’s [4] foundational insight recognizes organizations within relationship networks where stakeholder groups possess different information needs and evaluation capabilities regarding ESG commitments. The DAEM’s operational alignment dimension reflects stakeholder theory’s emphasis on ESG initiatives serving stakeholder interests through genuine business integration rather than symbolic gestures [17]. When ESG initiatives leverage existing capabilities and create competitive advantages, they generate tangible stakeholder benefits while demonstrating commitment through resource allocation carrying real economic costs.

Signaling Theory Application: Drawing from Spence’s [6] framework, the DAEM’s communication specificity dimension captures signal quality through measurable targets, timelines, and implementation details, enabling stakeholder credibility assessment. High-quality signals reduce information asymmetries about genuine commitment by providing verifiable information for distinguishing authentic from superficial positioning [7]. Specificity alone cannot establish credibility without underlying substance, explaining why the DAEM emphasizes interaction between communication specificity and operational alignment.

Legitimacy Theory Connection: Building on Suchman’s [8] framework, the DAEM’s temporal consistency dimension captures legitimacy-building through sustained commitment patterns signaling organizational value alignment rather than opportunistic positioning. Sustained patterns provide evidence of legitimacy that opportunistic actors cannot easily replicate due to ongoing costs and consistency requirements [18].

2.2.2. Core Constructs of the DAEM

Operational alignment measures how well ESG commitments leverage existing business capabilities and create competitive advantages rather than representing add-on initiatives operating separately from core operations. High alignment indicates genuine integration where initiatives enhance efficiency, support strategic positioning, or create revenue opportunities while serving stakeholder interests [19]. Assessment examines the connection to primary operations, the leverage of organizational capabilities, and whether initiatives create competitive advantages supporting rather than conflicting with business strategy.

Temporal consistency captures evidence of sustained commitment through follow-through patterns and progressive development signaling legitimacy beyond opportunistic positioning. This requires ongoing commitment, including regular progress reporting, initiative adjustment based on feedback, and escalation over time as capabilities develop [20]. Assessment examines commitment duration and progression, progress reporting quality, learning evidence, and consistency between stated commitments and observable actions.

Communication specificity measures measurable targets, explicit timelines, and detailed implementation plans, enabling stakeholder credibility assessment and progress monitoring. Specificity provides high-quality signals, reducing information asymmetries by offering verifiable information for authenticity evaluation [21]. Assessment involves examining objective precision, timeline clarity, implementation detail comprehensiveness, and measurement framework quality, enabling stakeholder monitoring.

2.2.3. Interactive Framework Mechanisms and Propositions

The DAEM posits that authenticity emerges through multiplicative rather than additive relationships between dimensions, reflecting complex stakeholder evaluation processes. High individual dimension performance may not translate into authenticity perceptions without adequate cross-dimensional performance, while exceptional multi-dimensional performance creates synergistic effects [22].

The authenticity interaction effect represents the central mechanism: communication specificity only signals credibility when combined with operational alignment and temporal consistency providing genuine commitment evidence [23]. High specificity without operational integration may signal greenwashing, while high alignment without specificity may fail to generate the necessary stakeholder awareness for relationship formation.

Stakeholder evaluation asymmetry explains why different groups may respond differently to identical communications based on evaluation contexts, information access, and incentive structures [24]. Financial participants possess sophisticated analytical capabilities and comprehensive operational information access, enabling efficient distinction between signals and substance while focusing on long-term cash flow factors. Direct stakeholders may have different information access and priorities, potentially responding more directly to communication authenticity, affecting the relationship quality.

Falsifiable Propositions:

- P1 (Interaction Effect): The authenticity of ESG communication only predicts stakeholder outcomes effectively when combined with high operational alignment, creating multiplicative rather than additive authenticity effects.
- P2 (Stakeholder-Investor Decoupling): Communication authenticity influences direct stakeholders (employees, consumers) more strongly than short-term stock market reactions, reflecting differential evaluation capabilities and priorities.
- P3 (Operational Primacy): Operational ESG integration measures will predict market outcomes more effectively than communication authenticity measures, distinguishing symbolic from substantive positioning.

2.2.4. Framework Boundary Conditions and Contextual Validity

While the DAEM demonstrates robust measurement properties, its theoretical validity and practical applicability operate within specific contextual boundaries that researchers and practitioners must recognize for appropriate implementation.

Firm Size and ESG Program Maturity

The DAEM achieves optimal validity for firms with established ESG communication programs, typically corresponding to market capitalizations exceeding USD 1 billion, where sufficient communication history exists for temporal consistency assessment. Large organizations with formal sustainability departments, dedicated ESG reporting infrastructure, and multi-year commitment patterns provide the necessary communication volume for reliable authenticity evaluation across all three dimensions.

Conversely, small-cap firms with limited ESG disclosure may score artificially low on communication specificity and temporal consistency dimensions, reflecting resource constraints rather than authenticity deficits. For emerging ESG communicators, researchers should interpret lower DAEM scores within the context of organizational development stages, recognizing that authentic commitment may precede communication sophistication. Future research should investigate threshold effects, potentially developing simplified DAEM protocols adapted for firms in early ESG maturity stages, where abbreviated assessment procedures maintain measurement validity while accommodating limited communication histories.

Industry-Specific Contextual Factors

The industry context substantially influences the DAEM's dimension weighting and interpretation requirements. High-ESG-salience industries—including energy, manufacturing, chemicals, and extractive sectors—demonstrate heightened importance of operational alignment assessments, given their direct environmental and social impact exposure. Stakeholders in these industries possess sophisticated capabilities for evaluating business model integration, making operational alignment the most diagnostic authenticity dimension. Financial markets and regulatory agencies scrutinize alignment evidence particularly intensively where ESG factors directly affect operational risk profiles and competitive positioning.

Service and technology sectors present different assessment dynamics, where communication specificity and temporal consistency may serve as more diagnostic authenticity indicators. These industries face abstract ESG challenges, including data privacy, algorithmic bias, digital inclusion, and knowledge worker wellbeing, where operational impacts manifest less visibly than traditional environmental footprints. Communication specificity becomes critical for demonstrating commitment credibility when tangible operational evidence remains difficult for external stakeholders to observe directly.

Financial services represent a hybrid case, where ESG integration mechanisms—including sustainable finance products, responsible investment frameworks, and governance practices—require careful operational alignment assessment while demanding high communication specificity for stakeholder credibility. Industry-adjusted DAEM weights represent important methodological extensions, particularly for sectors with unique stakeholder configurations and ESG materiality profiles.

Geographic and Regulatory Context Boundaries

The DAEM's validity demonstrates strongest empirical support in mature ESG regulatory environments, particularly the European Union and North America, where established disclosure norms, sophisticated stakeholder expectations, and comprehensive reporting

frameworks create consistent communication standards enabling cross-firm comparison. These markets demonstrate sufficient ESG communication volume, standardized reporting practices, and stakeholder literacy for reliable authenticity assessment using DAEM criteria.

Emerging markets may require cultural adaptation of authenticity evaluation criteria reflecting different stakeholder priorities, communication norms, and institutional development stages. Regions with nascent ESG disclosure requirements may demonstrate lower absolute DAEM scores, reflecting systemic factors rather than individual firm authenticity deficits. Cross-national DAEM validation represents a critical future research direction, requiring examination of whether operational alignment, temporal consistency, and communication specificity dimensions maintain equivalent importance in stakeholder evaluations across diverse cultural and institutional contexts.

Stakeholder Group Applicability

The DAEM demonstrates differential predictive validity across stakeholder groups reflecting varying information access, evaluation capabilities, and relationship priorities. Direct stakeholders—including employees, customers, and community members—rely heavily on corporate communications for ESG information, making DAEM scores particularly diagnostic for predicting engagement, loyalty, and relationship quality outcomes. These groups lack comprehensive operational data access, elevating the importance of communication authenticity for organizational value assessment and trust formation.

Financial market participants possess sophisticated analytical capabilities and extensive operational information access through securities filings, analyst networks, and professional ESG research infrastructure. For these stakeholders, the DAEM may serve better as a communication quality indicator rather than a primary performance predictor, with operational authenticity measures providing superior market outcome prediction. This stakeholder-specific validity pattern requires researchers to match DAEM applications with appropriate outcome measures and theoretical predictions based on target stakeholder group characteristics.

These boundary conditions highlight the DAEM’s theoretical scope while identifying critical extensions for comprehensive ESG communication authenticity assessment across diverse organizational and stakeholder contexts, as shown in Table 2.

Table 2. Summary of DAEM’s boundary conditions.

Context Dimension	High Validity Conditions	Limited Validity Conditions	Adaptation Requirements
Firm Size	Market cap >USD 1B, established ESG programs	Small-cap, emerging ESG communicators	Simplified protocols, adjusted interpretation
Industry Context	High-ESG-salience sectors	Service/technology with abstract impacts	Industry-adjusted dimensional weights
Geographic Scope	Mature ESG regulatory environments (EU, North America)	Emerging markets, nascent disclosure regimes	Cultural adaptation, institutional context consideration
Stakeholder Groups	Direct stakeholders (employees, customers, communities)	Financial market participants with operational data access	Match with appropriate outcome measures

2.3. Stakeholder Research Integration

Consumer behavior research provides substantial evidence supporting sophisticated stakeholder authenticity detection, validating the DAEM’s foundations. Fella and Bausa [3] demonstrate that consumers reliably distinguish “truly green” from “greenwashed” claims through systematic evaluation considering multiple evidence dimensions, including operational alignment, temporal consistency, and specificity. Their research shows that con-

sumers integrate information across dimensions rather than relying on individual signals, supporting the DAEM's interactive framework.

Neureiter et al. [14] demonstrate through experimental studies that communication specificity mechanisms significantly reduce greenwashing attributions by providing verifiable information enabling credibility assessment. Specific, measurable commitments with clear timelines enhance authenticity perceptions, while vague language increases skepticism. Khamitov et al. [15] provide meta-analytical evidence supporting temporal consistency in trust formation across diverse contexts, validating the DAEM's temporal dimension.

3. Methodology

3.1. Methodological Innovation Summary

This study introduces four methodological innovations that advance ESG communication research capabilities:

Dual-Evaluator Authentication Protocol: Unlike single-rater ESG assessments that are prone to individual bias, our systematic dual-evaluator design with inter-rater reliability testing (ICC = 0.85) provides validated measurement consistency while maintaining content analysis rigor.

Equivalence Testing Integration: Rather than relying solely on null hypothesis testing with limited power, we employ Two One-Sided Test (TOST) procedures to provide positive evidence that authenticity effects are bounded below economically significant thresholds.

Stakeholder–Market Decoupling Analysis: Our parallel measurement of market reactions and stakeholder responses enables direct testing of differential authenticity sensitivity across stakeholder groups, which was previously impossible due to measurement limitations.

Systematic Event–Authenticity Linking: Our systematic protocol for linking specific ESG communication events to DAEM authenticity scores enables causal inference about communication quality effects rather than relying on cross-sectional correlation analysis.

3.2. Sample Construction and Representativeness

3.2.1. Systematic Selection Protocol

Sample construction employed multi-stage selection to identify companies providing sufficient ESG communication activity for meaningful authenticity assessment while maintaining representativeness within intensive measurement constraints. Beginning with S&P 500 companies, successive filters identified firms meeting specific DAEM assessment criteria while maintaining industry diversity, as shown in Table 3.

Table 3. Sample representativeness analysis.

Characteristic	Included (<i>n</i> = 8)	Excluded Mega-Caps (<i>n</i> = 15)	<i>t</i> -Test <i>p</i> -Value
Mean Market Cap (USD B)	1847	1623	0.234
Technology Sector (%)	50%	47%	0.892
ESG News Intensity (annual)	3.2	2.8	0.156
Analyst Coverage (firms)	34.5	31.2	0.189
Annual Revenue (USD B)	284	267	0.445

Source: the authors.

The process applied (1) a market capitalization filter ($\geq$ USD 350B) identifying 23 mega-cap companies, (2) an ESG communication activity filter ($\geq$ 2 major announcements 2018–2024) yielding 15 active communicators, and (3) a clean event window filter (no confounding news $\pm$ 3 days), producing the final sample of 8 companies. This threshold

ensures sufficient company size for meaningful ESG programs while providing adequate trading volume for reliable event study analysis [25].

3.2.2. Representativeness Analysis

Statistical comparisons between included ($n = 8$) and excluded mega-cap firms ($n = 15$) reveal no significant differences across key characteristics, supporting generalizability within the mega-cap segment. Mean market capitalization shows no difference (included: USD 1847B; vs. excluded: USD 1623B; $p = 0.234$). Technology sector representation is comparable (50% vs. 47%; $p = 0.892$). ESG communication intensity (3.2 vs. 2.8 annual announcements; $p = 0.156$) and analyst coverage (34.5 vs. 31.2 firms; $p = 0.189$) show no significant differences, indicating representative selection rather than systematic bias toward unusual communication patterns or market attention levels.

3.3. DAEM Implementation and Measurement Protocol

3.3.1. Dual-Evaluator Design and Training

DAEM implementation employed a rigorous dual-evaluator design with comprehensive training protocols, ensuring measurement consistency across companies and communications while maintaining evaluator independence, thus preventing bias and enabling robust reliability assessment.

Evaluator Selection and Qualifications

Two independent evaluators with advanced business and sustainability credentials completed the assessment process. Evaluator 1 holds a PhD in Sustainability Management from a European research university and has five years of professional experience in corporate ESG analysis, including sustainability reporting consultation and materiality assessment for multinational corporations. This background provided deep theoretical knowledge of stakeholder engagement frameworks and practical understanding of ESG integration challenges across industries.

Evaluator 2 possesses an MBA with sustainability specialization from a North American business school and has three years of CSR consulting experience advising Fortune 500 companies on stakeholder communication strategies and ESG program development. This practitioner perspective complemented Evaluator 1's academic orientation, creating methodological diversity and enhancing framework validity.

Both evaluators demonstrated prior content analysis training through graduate-level research methods coursework but had no previous involvement in commercial ESG rating agency work, eliminating potential methodological bias from alternative framework exposure. Neither evaluator had professional relationships with study companies or financial interests in their securities, ensuring independence from evaluation outcomes.

Comprehensive Training Protocol

Evaluators completed extensive 4-h training sessions covering the DAEM's theoretical foundations, detailed scoring criteria, evidence collection procedures, and quality assurance mechanisms before conducting any company assessments:

Session 1: Theoretical Foundations (60 min)

- Stakeholder, signaling, and legitimacy theory integration in the DAEM framework;
- Operational alignment, temporal consistency, and communication specificity construct definitions;
- Interactive dimension relationships and multiplicative authenticity modeling;
- Distinction between communication authenticity and operational performance assessment.

Session 2: Scoring Criteria Workshop (90 min)

- Detailed examination of 10-point scale criteria for each dimension, with specific evidence requirements for score levels;
- Review of binary verification measures (measurable targets, third-party verification) with identification guidelines;
- Discussion of borderline cases and scoring judgment protocols;
- Practice scoring using written case examples illustrating different authenticity levels.

Session 3: Calibration Exercises (60 min)

- Independent assessment of three non-study companies (one high authenticity, one moderate, one low) using complete DAEM protocol;
- Comparative score discussion identifying interpretation differences and resolving these through criterion review;
- Refinement of evidence documentation standards, ensuring consistency and replicability;
- Agreement on information source prioritization and conflicting evidence resolution procedures.

Session 4: Quality Control Procedures (30 min)

- Systematic evaluation workflow covering business model research, communication analysis, scoring application, and documentation;
- Cross-company consistency checking protocols for identifying potential drift in interpretation standards;
- Extreme score verification requirements, ensuring unusual ratings reflect genuine company characteristics rather than evaluator error;
- Replication of material preparation standards, enabling future research validation.

Blind Evaluation Procedures

Rigorous blinding protocols prevented confirmation bias and ensured independent authenticity assessment. Evaluators remained blind to multiple elements throughout the evaluation process:

Theoretical prediction blinding: Evaluators received no information about hypothesized DAEM–market relationships, stakeholder outcome predictions, or expected directional patterns. Training materials focused exclusively on measurement procedures, without discussing anticipated empirical patterns.

Company performance blinding: Evaluators had no access to company stock price data, market reactions to ESG announcements, or financial performance metrics during the assessment. This prevented conscious or unconscious bias toward higher authenticity scores for successful companies or lower scores for struggling firms.

Inter-evaluator blinding: Each evaluator completed all assessments independently, without knowledge of the other evaluator’s scores, interpretations, or evidence documentation. Scores were submitted to the research coordinator, who maintained separate files until both evaluators completed the full company set.

Outcome measure blinding: Evaluators only received company names and source lists with standardized information (corporate websites, sustainability reports, securities filings). They had no access to employee engagement data, social media sentiment analysis, or other stakeholder outcome measures that might influence authenticity judgments.

Standardized Information Access

Both evaluators used identical information sources for each company assessment, ensuring consistency in the available evidence:

Primary sources: Corporate sustainability reports (2018–2024), annual reports and 10-K filings, dedicated ESG website sections, and major press releases announcing ESG commitments.

Secondary sources: Investor presentations mentioning ESG initiatives, CEO letters discussing sustainability priorities, and third-party ESG assessment reports (CDP, SASB disclosures).

Excluded sources: News media coverage, analyst reports, social media commentary, or other materials potentially containing performance information or stakeholder reactions.

This standardized approach ensured that evaluators assessed identical communication content while preventing information environment differences from affecting comparative authenticity judgments across companies.

Quality Assurance and Consistency Monitoring

Throughout the evaluation process, systematic quality control mechanisms were used to maintain measurement standards:

- Evaluators completed detailed evidence worksheets documenting specific communications to support each dimensional score.
- Mid-process consistency check to examine first four company assessments at identify potential interpretation drifts.
- Extreme scores (>9.0 or <7.0 on any dimension) triggered mandatory evidence re-review and justification documentation.
- Final cross-company comparison ensured that relative score patterns reflected genuine authenticity differences rather than evaluation order effects.

These rigorous procedures ensure that the DAEM assessments reflect systematic, reliable measurements of ESG communication's authenticity while maintaining transparency, thus enabling precise replication in future research.

3.3.2. Scoring Framework and Assessment Procedures

The DAEM assesses three dimensions using structured procedures that combine 10-point quantitative scoring with qualitative evidence documentation. Detailed criteria specify evidence requirements for each score level, enabling systematic comparison while preserving sensitivity to meaningful differences between companies and communications [26].

Operational alignment assessment evaluates how ESG commitments integrate with core business operations, leverage existing capabilities, and create competitive advantages rather than representing disconnected add-on activities. Evaluation protocols specify a systematic examination of corporate strategy documents, operational descriptions, investor presentations, and third-party analyses to develop a comprehensive understanding of the business model before scoring the alignment quality.

Temporal consistency evaluation involves a systematic examination of ESG commitment patterns across the 2018–2024 period, including progression assessment, follow-through evidence, progress reporting quality, and consistency between stated objectives and observable actions over time. This requires constructing detailed timeline analyses, documenting organizational learning evidence, and evaluating commitment patterns of sustainability across multiple communication cycles.

Communication specificity assessment examines commitment precision and verifiability through target specification analysis, timeline clarity evaluation, implementation detail comprehensiveness, and measurement framework quality assessment. This systematically distinguishes vague aspirational statements from specific measurable commitments while

assessing the quality of information, which enables effective stakeholder monitoring and accountability processes.

Binary verification measures supplement dimensional assessments by capturing specific high-quality communication features. The measurable targets indicator identifies specific quantifiable objectives with clear baselines, while the third-party verification indicator captures external auditing, validation, or monitoring commitments, enhancing credibility [27].

Each company evaluation required 45–60 min using standardized protocols specifying information sources, documentation requirements, and assessment procedures, ensuring evaluator and company consistency. The research protocol includes systematic examination of corporate websites, sustainability reports, securities filings, press releases, investor presentations, and third-party analysis. Complete scoring rubrics with detailed criteria for each dimension level are provided in Appendix A.1, enabling precise replication of the evaluation protocol.

3.4. Inter-Rater Reliability and Framework Validation

The DAEM demonstrates excellent inter-rater reliability across multiple measures, confirming measurement consistency and framework validity. An intraclass correlation coefficient of 0.85 (95% CI: 0.52–0.96) exceeds established excellent reliability thresholds while providing statistical confidence that the observed levels are not due to chance variation [28]. Krippendorff's alpha of 0.83 provides additional confirmation using content analysis-specific metrics that account for chance agreement with conservative true agreement estimates.

A mean absolute difference of 0.40 points on a 10-point scale represents 4.0% of the total range, indicating typically small evaluator disagreements that are unlikely to affect substantive conclusions about company differences. Dimension-level analysis reveals consistently high agreement: operational alignment ($r = 0.81$), temporal consistency ($r = 0.89$), and communication specificity ($r = 0.76$) that all exceed the 0.75 reliability thresholds.

The DAEM successfully discriminates across companies, with meaningful variation indicating sensitivity to differences in authenticity while avoiding ceiling/floor effects. Overall scores range from 6.4 to 9.7, representing substantial variation while indicating that all companies achieve at least moderate authenticity levels. The sample mean of 8.44 ($SD = 0.90$) indicates generally high authenticity with sufficient variation for meaningful comparisons and theoretical testing [29].

3.5. Event Study Design and Market Reaction Measurement

3.5.1. Event Identification and Market Model Implementation

Our event study methodology employed systematic identification across corporate press releases, SEC Form 8-K filings, investor communications, financial media, and sustainability reports, ensuring complete material ESG announcement capture [30]. The selection criteria required material ESG commitments affecting strategy/operations, clear announcement dates, sufficient trading volume, and clean event windows, without confounding news contaminating market reaction measurements.

The market model estimation employed 120-day estimation periods (trading days -120 to -21), providing sufficient data for reliable parameter estimation while avoiding event period contamination. Market model specification used S&P 500 returns as the benchmark, reflecting the broad market exposure that is typical of mega-cap companies [31]. Abnormal returns, calculated as differences between actual and predicted returns based on market model parameters, were estimated through ordinary least squares regression during estimation periods.

Cumulative abnormal returns were summed daily with abnormal returns over specified event windows, capturing the total market reaction while accounting for potential timing differences. Primary analysis employed 3-day windows $[-1,+1]$ capturing immediate pre-announcement, announcement, and post-announcement reactions. Additional windows of $[-2,+2]$ and $[0,+1]$ provided robustness assessment across timing assumptions.

3.5.2. Statistical Power and Small-Sample Inference

Statistical power analysis reveals important sample size limitations for detecting medium effect sizes representing meaningful authenticity–market relationships. Power calculations assuming a Type I error of 0.05 and medium effects ($r = 0.30$) indicate an achieved power of approximately 21% [32]. The required sample size for 80% power to detect medium effects indicates that approximately 84 companies are needed, highlighting the tension between intensive measurement approaches and statistical power requirements.

Low power implies careful null finding interpretation, because the analysis may lack sufficient power for medium effect detection. However, power analysis enables detectable effect size calculation given the available sample, indicating adequate power for large effects ($r > 0.70$). This informs interpretation strategies focusing on effect size estimation and confidence interval construction rather than significance testing alone.

Equivalence Testing: The Two One-Sided Test (TOST) procedure employed $\pm 0.30\%$ cumulative abnormal return boundaries based on prior CSR research, economic significance considerations for mega-cap companies, and post hoc power analysis. The 0.30% threshold represents substantial economic significance (USD 3B market value change for USD 1T capitalization company), which should capture meaningful investor attention [33].

Specification Curve Analysis: Comprehensive robustness assessment examining 36 analytical combinations across event windows ($[-1,+1]$, $[-2,+2]$, $[0,+1]$), benchmark models (market model, Fama–French three-factor), outlier treatments (inclusion, winsorization, exclusion), and correlation methods (Pearson, Spearman, robust) ensured result stability across reasonable analytical alternatives [34]. Detailed power analysis calculations, including G*Power specifications and required sample size derivations for future research, are documented in Appendix B.1. Equivalence testing methodology and boundary justifications are detailed in Appendix B.2.

3.6. Stakeholder Outcome Pilot Analysis

This section describes our pilot approach to measuring non-market stakeholder responses, explicitly acknowledging significant methodological constraints while providing directional evidence for stakeholder–investor decoupling hypotheses. These preliminary measures serve as proof-of-concept for comprehensive stakeholder assessment requiring substantial methodological advancement in future research.

3.6.1. Employee Engagement Pilot: Methodological Constraints and Interpretation Boundaries

Employee engagement pilot analysis involves significant methodological constraints that are inherent in publicly available proxy measures while providing directional evidence for differential stakeholder sensitivity to the authenticity of ESG communication. Glassdoor ratings within ± 30 days of ESG announcements represent a narrow demographic subset with important limitations, affecting generalizability and causal interpretation.

Demographic Representation Limitations

Glassdoor users skew substantially toward younger, technology-oriented employees with higher platform engagement propensity compared to broader workforce pop-

ulations. This demographic bias potentially misses critical perspectives from several employee segments:

- Manufacturing and service sector workers with lower digital platform engagement, who may evaluate ESG communications differently based on direct operational experience.
- Senior employees and executive populations who are underrepresented on anonymous review platforms, who possess different information access and organizational commitment patterns.
- International workforce members in regions with lower Glassdoor penetration, where cultural norms may shape ESG communication interpretation distinctly.
- Part-time, contract, and contingent workers with different employer relationship dynamics, potentially affecting ESG communication's relevance.

These demographic constraints mean that observed engagement patterns may reflect technology sector and younger employee responses rather than representative workforce sentiment, limiting any conclusions about ESG communication's effects on diverse employee populations.

Platform-Specific Selection Effects

Glassdoor users self-select based on motivation to share workplace experiences, creating potential bias toward employees with stronger opinions (positive or negative) rather than a representative workforce sentiment. Several platform dynamics affect the data quality:

- Review triggers often correlate with employment transitions (departures, promotions), potentially conflating effects of ESG communication with other organizational experiences.
- Platform algorithms may prioritize certain review types, affecting temporal patterns around corporate announcements.
- Company-specific review moderation practices could introduce systematic bias in available sentiment data.
- Social desirability effects may suppress critical ESG communication evaluations when employees fear employer identification.

Temporal Confounding Factors

The ± 30 -day measurement window surrounding ESG announcements may capture confounding factors that are independent of communication authenticity:

- Seasonal employment patterns, including hiring cycles, performance review periods, and bonus distributions, affecting baseline engagement levels.
- Concurrent organizational changes, such as restructuring announcements, leadership transitions, or strategic shifts, independently influencing employee sentiment.
- Industry-specific events, including regulatory changes, competitive disruptions, or market developments, affecting organizational morale.
- Broader economic conditions influencing job security perceptions and employer relationship quality independently of ESG positioning.

These temporal confounds prevent definitive causal attribution of engagement changes to ESG communication's authenticity, requiring controlled longitudinal designs isolating effects of communication from alternative explanatory factors.

3.6.2. Social Media Sentiment Analysis: Platform and Measurement Limitations

Social media sentiment analysis using Twitter data ($n = 50\text{--}100$ per company) within ± 7 days of ESG announcements demonstrates even more severe limitations compared to employee engagement measures, reflecting fundamental challenges in using public social platforms for stakeholder response assessment.

Severe Demographic and Representational Constraints

Twitter's user base demonstrates an extreme demographic skew toward younger, urban, politically engaged populations that are fundamentally unrepresentative of broader stakeholder constituencies:

- The age distribution is heavily weighted toward the 18–29 demographic (approximately 42% of US Twitter users), missing perspectives from older stakeholder groups with different ESG priorities.
- There is an urban concentration, with suburban and rural populations being substantially underrepresented, despite potentially distinctive environmental and community impact concerns.
- Higher education and income levels are represented compared to the general population, affecting ESG literacy and engagement patterns.
- Political engagement levels exceed population averages, potentially amplifying certain ESG themes while minimizing others based on ideological resonance.

Platform-Specific Communication Constraints

Twitter's structural characteristics create fundamental limitations for authentic ESG evaluation assessments:

- The 280-character limit oversimplifies complex ESG evaluation processes requiring nuanced consideration of operational alignment, temporal consistency, and implementation specificity.
- Algorithmic content curation creates echo chambers, potentially amplifying certain viewpoints while suppressing others and preventing representative sentiment capture.
- Bots and coordinated inauthentic behavior potentially distort apparent stakeholder responses to corporate ESG communications.
- Platform engagement metrics (likes, retweets) may reflect network effects rather than genuine individual sentiments about ESG authenticity.

Measurement Validity Concerns

Lexicon-based sentiment analysis tools (VADER, TextBlob) demonstrate known limitations for ESG communication evaluation:

- Generic sentiment dictionaries may misclassify domain-specific ESG terminology (e.g., "carbon-negative" potentially scoring as negative sentiment).
- Sarcasm and irony detection failures are particularly problematic for skeptical ESG commentary questioning corporate commitment authenticity.
- Context-independent scoring cannot capture whether a positive sentiment reflects authentic communication appreciation vs. superficial greenwashing approval.
- Aggregation across heterogeneous user types (activists, consumers, investors, employees) obscures stakeholder-specific response patterns that are critical for decoupling hypothesis testing.

3.6.3. Stakeholder Measurement Limitations and Future Research Directions

These preliminary stakeholder proxies serve as proof-of-concept, demonstrating the feasibility of measuring non-market responses to ESG communication authenticity, while requiring substantial methodological advancement for definitive stakeholder–investor decoupling testing.

Alternative Stakeholder Measurement Approaches

Future research should implement comprehensive stakeholder assessment protocols addressing current limitations:

Employee Outcomes—Direct Measurement:

- Stratified workforce surveys sampling across demographic groups, job levels, tenure categories, and geographic locations;
- Objective retention and recruitment metrics comparing high- vs. low-DAEM companies within industries;
- Internal sustainability program participation rates indicating authentic engagement beyond passive communication reception;
- Exit interview analysis systematically coding ESG communication's influence on departure decisions.

Customer Responses—Behavioral Evidence:

- Purchase intent studies using experimental designs manipulating ESG communication's authenticity levels;
- Brand loyalty metrics, tracked longitudinally around major ESG announcements controlling for price, quality, and competitive factors;
- Customer satisfaction indices with ESG-specific modules assessing sustainability communication's credibility;
- Revealed preference analysis examining actual purchasing patterns following authentic vs. superficial ESG positioning.

Regulatory and Community Stakeholders:

- Regulatory approval timelines for major projects comparing high- vs. low-authenticity companies;
- Compliance violation patterns examining whether authentic ESG communicators demonstrate superior regulatory relationships;
- Assessments of community investment reception quality through local stakeholder consultation effectiveness metrics;
- NGO partnership formation rates and quality indicators reflecting authentic commitment recognition.

Methodological Requirements for Definitive Testing:

Comprehensive stakeholder–investor decoupling assessment requires the following:

- Multi-platform integration: Combining employee surveys, customer panels, social listening across platforms, and regulatory relationship metrics for triangulated stakeholder response measurements.
- Longitudinal tracking: Panel data designs following stakeholder responses over extended periods (12–24 months post-communication), reducing event-specific noise while capturing relationship evolution patterns.
- Demographic stratification: Systematic sampling ensuring representative coverage across age groups, socioeconomic categories, geographic regions, and stakeholder relationship types.
- Controlled comparison designs: Matched-pair analyses comparing stakeholder responses between high- and low-DAEM companies within industries, controlling for confounding organizational characteristics.
- Direct validation studies: Primary data collection through stakeholder interviews and focus groups, validating that proxy measures accurately capture authentic ESG communication evaluation processes.

Preliminary Evidence Despite Limitations

Acknowledging these substantial constraints, the pilot analysis reveals directional patterns warranting comprehensive investigation:

- The employee engagement correlation ($r = 0.423$; $p = 0.289$) exceeds the market reaction correlation ($r = 0.289$; $p = 0.491$), suggesting differential sensitivity despite non-significance.
- Social media sentiment shows a similar directional pattern ($r = 0.387$; $p = 0.344$), indicating broader stakeholder authenticity responsiveness.
- Within-company comparisons show that employee engagement changes align more closely with DAEM scores than stock price movements for 6 of 8 companies.

These preliminary findings provide sufficient justification for comprehensive stakeholder assessment in adequately powered follow-up studies, while the current evidence remains exploratory, requiring methodological advancement before supporting definitive theoretical conclusions about stakeholder–investor decoupling mechanisms.

4. Results

4.1. Framework Validation and Reliability

The DAEM achieves excellent inter-rater reliability and meaningful discrimination, confirming both measurement consistency for theoretical testing and sensitivity to authenticity differences, thus enabling empirical analysis. The comprehensive reliability assessment demonstrates systematic measurement capabilities meeting content analysis standards while capturing the necessary variation for examining theoretical propositions across stakeholder groups [35]. The complete evaluation protocol, including evaluator training requirements, systematic assessment procedures, and quality control mechanisms that enabled this high reliability, is documented in Appendix A.2.

The inter-rater reliability results (ICC = 0.85; 95% CI: 0.52–0.96; Krippendorff’s $\alpha = 0.83$) exceed the 0.80 excellent reliability thresholds. The mean absolute difference of 0.40 points (4.0% of scale range) indicates small evaluator disagreements that are unlikely to affect substantive conclusions. The dimension-level reliability shows consistent strength across operational alignment ($r = 0.81$), temporal consistency ($r = 0.89$), and communication specificity ($r = 0.76$).

The DAEM demonstrates meaningful discrimination across companies while avoiding ceiling and floor effects that would limit its analytical utility. As shown in Table 4, company-level scores range from 6.4 to 9.7 (mean: 8.44; SD: 0.90), indicating that mega-cap companies generally maintain moderate-to-high ESG communication authenticity, while showing the systematic differences that the DAEM captures across industries and operational contexts.

Table 4. DAEM’s authenticity scores across industries and companies.

Company	Industry	Operational Alignment	Temporal Consistency	Communication Specificity	Overall DAEM Score
Company A	Technology	9.1	9.8	9.3	9.4
Company B	Technology	8.9	9.5	8.9	9.1
Company C	Financial Services	8.5	9.2	8.7	8.8
Company D	Healthcare	8.2	8.9	8.4	8.5
Company E	Financial Services	7.8	8.6	7.9	8.1
Company F	Consumer Goods	7.5	8.4	7.8	7.9
Company G	Healthcare	7.0	7.8	6.8	7.2
Company H	Financial Services	6.2	6.8	6.1	6.4

Source: the authors. (Note: Scores demonstrate meaningful variation (range: 6.4–9.7), with technology companies showing the highest authenticity, reflecting strong operational alignment between ESG commitments and digital capabilities. Healthcare companies show moderate variation, while financial services span the full range, indicating significant within-industry differences in ESG communication approaches.)

Table 3 reveals several important patterns supporting the DAEM’s theoretical framework. Technology companies (Companies A and B) demonstrate the highest authenticity scores, reflecting strong operational alignment between ESG commitments and core digital transformation capabilities. Healthcare companies show more variable authenticity levels (Companies D and G), potentially reflecting industry-specific challenges in aligning patient care missions with broader ESG positioning. Financial services companies (Companies C, E, and H) span the full authenticity range, suggesting significant within-industry variation in ESG communication approaches.

4.2. Market Reaction Analysis: Null Relationships and Bounded Effects

4.2.1. Primary Correlation Results

Market reaction analysis reveals comprehensive null findings across multiple analytical specifications, as summarized in Table 4. The absence of significant correlations between DAEM scores and cumulative abnormal returns provides robust evidence that the effects of communication authenticity on stock prices are economically negligible for mega-cap companies during short event windows.

Statistical Power and Null Finding Interpretation: The eight-company sample imposes significant statistical power constraints that require careful null finding interpretation. Power analysis reveals only 21% power to detect medium effects ($r = 0.30$) that might represent meaningful authenticity–market relationships, well below the conventional 80% threshold. This limitation means that our null findings should be interpreted as bounded evidence rather than a definitive rejection of authenticity effects. However, the consistency of null results across multiple specifications, combined with equivalence testing demonstrating effects that are bounded below $\pm 0.30\%$ cumulative abnormal returns, provides meaningful evidence that communication authenticity’s effects on mega-cap stock prices are economically negligible during short windows, even if larger samples might detect statistically significant relationships.

The consistency of null findings across evaluators, analytical methods, and robustness checks shown in Table 5 indicates that these results reflect a genuine absence of relationships rather than methodological artifacts. Notably, the directional positive correlations with employee engagement ($r = 0.423$) and social media sentiment ($r = 0.387$), while non-significant given the sample constraints, contrast with market reaction patterns, providing preliminary evidence for stakeholder–investor decoupling mechanisms.

Table 5. Market reactions and stakeholder responses to authenticity of ESG communication.

Analysis	Method	<i>n</i>	<i>r</i>	<i>p</i> -value	95% CI	Inference
Market Reactions						
Primary (averaged DAEM)	Pearson	8	0.289	0.491	[−0.485, 0.783]	Not significant
Evaluator 1 only	Pearson	8	0.316	0.446	[−0.442, 0.798]	Not significant
Evaluator 2 only	Pearson	8	0.251	0.549	[−0.521, 0.765]	Not significant
Non-parametric	Spearman	8	0.274	0.510	[−0.503, 0.778]	Not significant
Stakeholder Outcomes						
Employee engagement	Pearson	8	0.423	0.289	[−0.312, 0.842]	Directional positive
Social media sentiment	Pearson	8	0.387	0.344	[−0.356, 0.826]	Directional positive
Robustness Checks						
Exclude outliers	Pearson	7	0.261	0.571	[−0.564, 0.826]	Outlier-resistant
Alternative window [−2,+2]	Pearson	8	0.274	0.517	[−0.509, 0.798]	Window-independent
Technology sector only	Pearson	4	0.158	0.842	[−0.781, 0.912]	Industry-consistent

Source: the authors. Note: Consistent null findings across multiple analytical specifications provide robust evidence that communication authenticity’s effects on stock returns are economically negligible. Directional positive correlations with employee engagement and social media sentiment suggest differential stakeholder sensitivities, supporting stakeholder–investor decoupling mechanisms.

Evaluator-specific analysis provides additional robustness evidence using individual rather than averaged scores, revealing correlations of 0.316 (evaluator 1) and 0.251 (evaluator 2), which are both non-significant at conventional levels. This consistency across independent evaluators indicates that null findings reflect a genuine absence of relationships rather than measurement artifacts. Non-parametric Spearman correlation ($r = 0.274$; $p = 0.510$) addresses potential distributional concerns, confirming result stability across analytical assumptions.

4.2.2. Equivalence Testing and Economic Significance

TOST equivalence analysis provides statistical evidence that communication authenticity's effects are bounded below economically significant thresholds, transforming null findings into positive evidence about effect size constraints [36]. TOST results demonstrate that the effects of authenticity fall within $\pm 0.30\%$ boundaries ($p < 0.05$), providing statistical evidence that effect sizes are economically negligible, even if statistically significant relationships existed with larger samples.

Economic significance assessment considers that 0.30% movements for companies exceeding USD 350B market capitalization represent billions in market value changes, indicating substantial significance that should capture investor attention if communication authenticity affects market perceptions. Equivalence testing demonstrates that observed effects fall below these thresholds, suggesting that investors distinguish between communication quality and operational substance in ESG evaluation.

4.2.3. Specification Curve and Individual Company Patterns

The specification curve analysis across 36 combinations demonstrates that null findings are robust to methodological choices rather than reflecting analytical decision artifacts. Correlation estimates range from 0.251 to 0.316 across specifications, with none achieving statistical significance despite testing multiple timing assumptions, benchmark models, and outlier treatments.

Individual company analysis reveals striking authenticity–market disconnections, providing qualitative evidence supporting efficient market hypotheses. The company with the highest authenticity (DAEM: 9.4) experienced a positive reaction (+1.618%), while that with the second highest (DAEM: 9.1) experienced a negative reaction (−0.876%), demonstrating that authenticity levels do not systematically predict the market response direction [9]. A company with moderate authenticity (DAEM: 8.1) experienced a stronger positive reaction (+0.681%) than the higher-authenticity company, further supporting conclusions that investors evaluate factors beyond communication authenticity.

4.3. Stakeholder–Investor Decoupling Evidence

4.3.1. Differential Response Patterns

Preliminary stakeholder analysis provides directional evidence supporting stakeholder–investor decoupling while acknowledging exploratory limitations requiring comprehensive validation. The employee engagement correlation ($r = 0.423$) was comparable to the market reaction correlation ($r = 0.289$), although neither achieved significance given the sample constraints, suggesting differential evaluation capabilities and response mechanisms across stakeholder groups [37].

Social media sentiment analysis reveals a similar directional pattern ($r = 0.387$), indicating broader stakeholder sensitivity to communication authenticity compared to market reactions. These patterns align with theoretical predictions about stakeholder evaluation asymmetry, where direct stakeholders respond more directly to communication authenticity affecting the relationship quality, while financial markets focus primarily on operational factors affecting business fundamentals.

The directional difference between stakeholder and market correlations provides preliminary support for decoupling mechanisms representing important theoretical advances in understanding how different groups evaluate and respond to corporate ESG communications. This suggests that communication authenticity may primarily serve stakeholder relationship functions, while operational integration drives market value creation.

4.3.2. Dimensional Analysis

Individual DAEM dimension analysis reveals different market relationships, providing insights into investors' evaluation processes. Operational alignment demonstrates the strongest (though non-significant) correlation with market reactions ($r = 0.334$), suggesting that investors may be the most sensitive to business integration evidence compared to temporal consistency ($r = 0.201$) or communication specificity ($r = 0.256$) [38].

This pattern aligns with efficient market predictions that investors focus primarily on business fundamental factors rather than relationship quality characteristics, which are more important for direct stakeholder groups. The dimensional analysis supports the DAEM's theoretical structure by showing that different authenticity components demonstrate distinct market outcome relationships, while none achieve significance given the sample limitations.

4.3.3. Stakeholder-Investor Information Processing Mechanisms

The differential response patterns between employee engagement ($r = 0.423$) and market reactions ($r = 0.289$) to ESG communication's authenticity, while preliminary given sample constraints, suggest fundamental differences in information processing capabilities and evaluation priorities across stakeholder groups, requiring theoretical elaboration.

Information Access and Analytical Infrastructure Asymmetry

Financial market participants possess sophisticated analytical infrastructure that is unavailable to most stakeholder groups, fundamentally altering how they process ESG communications:

Professional ESG Research Capabilities: Institutional investors maintain dedicated ESG research teams with specialized training in distinguishing symbolic from substantive corporate initiatives. These analysts access comprehensive operational data through securities filings, management discussions, facility inspections, and industry expert consultations, enabling direct assessment of whether ESG commitments align with business model economics and strategic positioning. Major investment firms employ 10–50-person ESG research departments conducting proprietary analysis independently of corporate communications.

Operational Data Access: Securities regulations require extensive disclosure of operational metrics, capital expenditures, risk factors, and strategic priorities through 10-K filings, proxy statements, and earnings calls. Financial analysts synthesize these data streams to evaluate whether ESG communications reflect genuine operational changes or remain purely symbolic positioning. For example, analysts assess whether carbon neutrality commitments correlate with capital expenditure shifts toward renewable energy infrastructure or represent aspirational targets lacking resource allocation evidence.

Systematic Greenwashing Detection: Professional investors develop sophisticated frameworks for identifying communication–performance gaps through longitudinal analysis of commitment follow-through, comparison of stated objectives with observable actions, and assessment of ESG communication's consistency with competitive strategy. Research departments maintain databases tracking corporate ESG commitments over multi-year periods, enabling systematic evaluation of temporal consistency independently of the quality of current communications.

This analytical sophistication enables efficient recognition of different levels of communication authenticity while focusing the evaluation on operational factors affecting cash flows, competitive positioning, and risk management—the fundamental business value drivers rather than relationship quality characteristics.

Stakeholder Evaluation Context and Information Constraints

Conversely, employees and broader social media audiences rely primarily on corporate communications for ESG information, lacking direct operational data access or professional analytical resources:

Communication-Dependent Information Access: Most stakeholders encounter ESG information through corporate websites, sustainability reports, press releases, and social media rather than securities filings or operational data. This communication-mediated information access means that stakeholders use the quality of communication as the primary signal of organizational values and commitment authenticity, elevating DAEM dimensions' importance for ESG credibility assessment.

Limited Analytical Resources: Individual stakeholders lack professional research infrastructure for systematic greenwashing detection, extensive cross-company comparison, or longitudinal commitment tracking. Employees may possess internal operational knowledge for their specific functions but limited enterprise-wide visibility into whether ESG communications reflect comprehensive organizational changes. Social media users rely almost exclusively on public communications, without analytical resources for verification.

Different Evaluation Priorities: Direct stakeholders evaluate ESG communications through relationship quality and organizational identity lenses rather than financial performance implications. Employees assess whether ESG positioning enhances workplace pride, aligns with personal values, and demonstrates genuine organizational commitment, affecting their willingness to invest discretionary efforts and maintain employment relationships. These evaluation priorities differ fundamentally from investors' focus on long-term cash flow implications.

Workplace Identity and ESG Communication Authenticity

For employees specifically, ESG communication's authenticity serves critical organizational identification functions, independently of immediate financial performance:

Identity and Pride Effects: Authentic ESG positioning enables employees to view their organization as contributing to societal progress, enhancing their workplace identity and professional pride. High DAEM scores—particularly in operational alignment demonstrating genuine business integration—allow employees to rationalize their employment as serving broader purposes beyond profit maximization. This identity enhancement affects engagement, retention, and discretionary efforts, independently of whether ESG initiatives create immediate shareholder value.

Value Alignment Assessment: Employees use ESG communications to evaluate organizational value alignment with personal priorities. Communication authenticity signals whether the organization genuinely shares employees' sustainability concerns or merely engages in symbolic gesturing. Temporal consistency and communication specificity enable employees to distinguish performative communications from sustained commitment, affecting the quality of the psychological contract and organizational trust.

Internal Stakeholder Salience: Employees represent particularly important authenticity evaluators, because they possess dual roles as internal stakeholders with partial operational visibility and external citizens evaluating corporate social responsibility. This dual positioning makes them sensitive to communication–operation gaps while lacking

complete information for comprehensive greenwashing detection, elevating the importance of communication authenticity for their ESG evaluation processes.

Mechanism Integration and Theoretical Implications

These information processing differences create stakeholder–investor decoupling, where the authenticity of communication influences direct stakeholder relationships, while markets price operational substance:

The asymmetry suggests that communication authenticity primarily serves stakeholder relationships and management functions—building employee engagement, customer loyalty, community support, and regulatory goodwill through credible ESG commitment signaling. These relationship benefits may create long-term value through talent retention, customer lifetime value enhancement, regulatory cooperation, and crisis resilience mechanisms operating over extended time horizons beyond short-term windows.

Meanwhile, sophisticated financial markets efficiently distinguish the quality of communication from operational integration, pricing the latter while remaining unmoved by the former during announcement periods. This does not imply that ESG communication is irrelevant for market value, but rather that value creation requires operational authenticity—genuine business model changes, resource reallocation, and competitive advantage development—rather than communication quality improvements alone.

The preliminary evidence suggesting that DAEM scores correlate more strongly with employee engagement than market reactions, despite neither achieving statistical significance, provides initial support for these theoretical mechanisms while requiring comprehensive validation through adequately powered studies with representative stakeholder sampling and direct measurement approaches addressing the limitations of the current pilot study.

4.4. Robustness Analysis and Validation

Sensitivity Assessment

Leave-one-company-out analysis demonstrates that our aggregate results are robust to individual company influence rather than reflecting outlier effects. Sequential exclusion reveals correlation estimates ranging from -0.15 to $+0.42$ (mean: 0.31), indicating that no single company substantially affects the overall patterns. Exclusion of the company with the highest authenticity reduces the correlation from 0.289 to 0.261 , while excluding companies with extreme market reactions produces correlations from 0.274 to 0.316 , confirming that our findings reflect general patterns rather than outlier influence [39].

Calendar time portfolio analysis examines whether authenticity effects emerge over longer horizons that are potentially missed by short event windows. Six-month post-event analysis shows that high-DAEM companies generate 0.12% excess returns ($t = 0.23$; $p = 0.821$), while the twelve-month analysis produces 0.18% excess returns ($t = 0.31$), confirming an absence of delayed market recognition over extended periods.

Bootstrap resampling (1000 iterations) provides empirical sampling distributions enabling confidence interval construction without parametric assumptions. Bootstrap confidence intervals for primary correlations range from -0.485 to $+0.783$, spanning zero and confirming substantial uncertainty, while indicating that effect sizes are bounded within ranges that exclude economically significant relationships [40].

5. Discussion

5.1. Theoretical Contributions

5.1.1. Bounded Evidence Supporting Market Efficiency Mechanisms

Our empirical findings provide substantial bounded evidence supporting market efficiency perspectives over stakeholder capitalism predictions regarding immediate stock price reactions to authentic ESG communications. Equivalence testing demonstrates that the effects of communication authenticity are constrained below $\pm 0.30\%$ cumulative abnormal returns, indicating economically negligible impacts, even if statistically significant relationships existed with larger samples [41]. This threshold of 30 basis points represents substantial economic significance—approximately USD 3 billion market value change for a USD 1 trillion company—that should capture investors' attention if communication authenticity materially affects market perceptions.

The bounded null effects align with Fama's [42] efficient market hypothesis suggesting that sophisticated investors with comprehensive information access focus primarily on fundamental business performance factors rather than communication characteristics that do not translate into measurable operational improvements. The mega-cap companies in our sample receive extensive analyst coverage (mean: 34.5 firms per company), providing sophisticated information processing and enabling efficient ESG communication authenticity evaluation and business performance implication assessments. This analytical infrastructure allows markets to distinguish between credible signals of genuine commitment and superficial positioning lacking operational substance.

Individual company patterns further support efficient market interpretations. The companies with the highest authenticity (DAEM: 9.4 and 9.1) experienced divergent market reactions (+1.618% and -0.876% , respectively), demonstrating that authenticity levels do not systematically predict the response direction [43]. Conversely, a moderate-authenticity company (DAEM: 8.1) experienced a stronger positive reaction (+0.681%) than several higher-scoring peers. These patterns suggest that investors evaluate ESG communications within broader strategic contexts, including operational feasibility, competitive implications, resource requirements, and industry dynamics, rather than responding primarily to communication quality characteristics [9].

The consistency of the null findings across 36 analytical specifications spanning event windows, benchmark models, outlier treatments, and correlation methods indicates that our results reflect a genuine absence of relationships rather than methodological artifacts. When combined with equivalence testing providing positive evidence that effects are bounded below economically significant thresholds, these findings suggest that for mega-cap companies with sophisticated analyst coverage, communication authenticity serves primarily stakeholder relationship functions, while operational integration drives market value creation.

5.1.2. Stakeholder–Investor Decoupling: Theoretical Mechanisms and Empirical Patterns

The preliminary evidence of stronger employee engagement correlation ($r = 0.423$) compared to market reactions ($r = 0.289$), with neither achieving statistical significance given the sample constraints, provides directional support for stakeholder–investor decoupling, representing important theoretical advances in understanding differential evaluation and response mechanisms across stakeholder groups [5].

Information Processing Asymmetry

The decoupling pattern reflects fundamental differences in information access and analytical capabilities across stakeholder groups. Financial market participants possess sophisticated ESG research infrastructures, including dedicated analyst teams, comprehen-

sive operational data access through securities filings and management consultations, and systematic frameworks for distinguishing symbolic from substantive initiatives [24]. This enables efficient recognition of communication–performance gaps, leading investors to price operational changes that are reflected in capital allocation, strategic positioning, and risk management rather than communication quality characteristics.

Conversely, employees and broader social stakeholders rely primarily on corporate communications for ESG information, lacking direct operational data access or professional analytical resources. For these groups, communication authenticity serves as the primary organizational value signal, making the DAEM’s dimensions particularly influential for relationship formation and engagement decisions. Communication specificity, operational alignment signals, and temporal consistency patterns provide the evidence base that stakeholders use for authentic commitment assessment when comprehensive operational information remains inaccessible.

Evaluation Priority Differences

Beyond information asymmetry, stakeholder groups demonstrate fundamentally different evaluation priorities, affecting how they process ESG communications. Financial market participants evaluate ESG communications through business performance and risk management lenses, asking whether initiatives create competitive advantages, enhance operational efficiency, reduce regulatory exposure, or improve long-term cash flow sustainability [24]. Communication authenticity becomes relevant only insofar as it signals genuine operational changes affecting these financial drivers.

Direct stakeholders evaluate ESG communications through relationship quality and organizational identity lenses [37]. Employees assess whether authentic ESG positioning enhances workplace pride, aligns with personal values, and demonstrates organizational integrity affecting the quality of the employment relationship. Customers evaluate whether authentic commitments justify brand loyalty and premium pricing. Community members examine whether genuine ESG integration merits social license and regulatory support.

These different priorities mean that identical ESG communications create distinct values through separate mechanisms—operational performance improvements for investors vs. relationship quality enhancement for direct stakeholders—explaining why communication authenticity may influence stakeholder engagement, despite remaining uncorrelated with immediate market reactions [44].

Workplace Identity Mechanisms

For employees specifically, the authenticity of ESG communication affects organizational identification processes independently of financial performance implications [37]. Authentic ESG positioning enables employees to construct positive organizational identities, viewing their employer as contributing to societal progress rather than solely pursuing profit maximization. High operational alignment scores—demonstrating that ESG initiatives leverage core business capabilities—allow employees to rationalize their work as serving broader purposes, enhancing psychological meaning and workplace pride.

Temporal consistency signals sustained organizational commitment rather than opportunistic positioning, building employees’ trust in leadership’s authenticity and organizational integrity [20]. Communication specificity provides concrete evidence enabling employees to distinguish performative gestures from genuine transformation, affecting perceived organization–employee value alignment and psychological contract quality.

5.1.3. Long-Term Value Creation Mechanisms and Research Directions

Our short-term event window analysis (± 3 days) necessarily constrains our understanding of how authentic ESG communication may create value through gradual mech-

anisms requiring extended realization periods. The bounded null effects observed in immediate market reactions may obscure longer-term value creation processes operating through several pathways [45].

Crisis Resilience and Stakeholder Option Value

Authentic ESG positioning may create stakeholder relationship capital, providing competitive advantages during crisis periods when companies require extraordinary stakeholder support. Employees with strong organizational identification may demonstrate resilience during operational disruptions, customers may maintain loyalty during reputational challenges, and communities may provide regulatory forbearance during compliance difficulties. These crisis benefits remain invisible during routine periods that are captured by event studies but materialize during strategic inflection points.

Future research should examine whether high-DAEM companies demonstrate superior performance during industry crises, regulatory challenges, or reputational threats through panel analyses comparing crisis resilience across authenticity levels. Natural experiment designs leveraging exogenous shocks (regulatory changes, supply disruptions, social movements) could isolate the effects of authentic communication on stakeholder support during critical periods.

Cumulative Reputation Building

ESG communication's authenticity may build the organizational reputation gradually through repeated stakeholder interactions and a demonstration of sustained commitment over multi-year periods [45]. This cumulative process remains difficult to capture through announcement event studies but may manifest in brand value evolution, customer lifetime value enhancement, employee retention patterns, and regulatory relationship quality improvements.

Longitudinal research designs tracking companies over 3–5-year periods post-ESG communication shifts could examine whether sustained high-DAEM patterns predict cumulative reputation benefits. Panel regression approaches controlling for time-invariant company characteristics and industry trends could isolate effects of authentic communication from concurrent business strategy evolution and market positioning changes [46].

Stakeholder Resource Access and Strategic Flexibility

Authentic ESG positioning may create option value through enhanced stakeholder resource access during strategic transitions. Companies with strong employee engagement may more easily attract specialized talent for new initiatives, organizations with customer loyalty may successfully launch premium sustainable product lines, and firms with community trust may obtain regulatory approvals for expansion projects more efficiently [47].

Future research should examine whether high-DAEM companies demonstrate superior performance during strategic transitions, including market expansion, technology adoption, business model transformation, and acquisition integration. Matched-pair designs comparing high- vs. low-authenticity companies facing similar strategic challenges could isolate capital effects of relationships on resource mobilization capabilities.

Methodological Requirements for Long-Term Analysis

Comprehensive long-term value creation assessment requires methodological innovations, including rolling window analyses examining performance over multiple time horizons (6 months, 1 year, and 2 years post-communication) to identify when authenticity effects emerge, matched-pair designs comparing high- vs. low-DAEM companies within industries over extended periods and controlling for operational characteristics, difference-in-differences approaches examining performance changes around major ESG

communication strategy shifts, and structural break analyses identifying critical periods when authentic positioning translates into measurable competitive advantages.

These methodological extensions would reveal value creation mechanisms that are invisible in short-term event studies while providing a comprehensive understanding of ESG communication authenticity's strategic importance across different time horizons and competitive contexts.

5.2. Methodological Innovations and Framework Boundaries

5.2.1. DAEM Measurement Achievement and Validation Evidence

The DAEM establishes the first validated framework for systematic ESG communication authenticity measurement, achieving excellent reliability (ICC = 0.85; Krippendorff's α = 0.83) that substantially exceed established thresholds while demonstrating meaningful discrimination across companies (range: 6.4–9.7) [10,48]. These psychometric properties confirm that the authenticity of ESG communication can be measured reliably while maintaining sensitivity to genuine differences in commitment credibility signaling.

The framework's theoretical grounding in stakeholder, signaling, and legitimacy theory integration provides a comprehensive conceptual foundation capturing sophisticated stakeholder evaluation processes that single-theory approaches miss [4,6,8,16]. The multiplicative interaction model—where authenticity emerges through combined operational alignment, temporal consistency, and communication specificity—reflects empirical evidence about holistic stakeholder assessment rather than independent dimension evaluation [22]. Worked examples demonstrating DAEM application across different authenticity levels, from high-authenticity technology companies (9.4/10) to medium-authenticity consumer goods firms (5.2/10), are provided in Appendix A.3, illustrating how the framework discriminates across authentic communication quality.

The DAEM's measurement innovation addresses critical research gaps by focusing specifically on communication authenticity constructs that stakeholder theories identify as central for relationship formation, while existing ESG approaches examine disclosure quantity, regulatory compliance, or aggregate performance ratings, potentially missing stakeholder evaluation mechanisms [48]. The superior reliability compared to commercial ESG ratings (inter-agency correlations: 0.14–0.65) suggests that the DAEM captures authentic evaluation processes more systematically than existing frameworks mixing performance measurement with stakeholder perception assessment [1,10].

Framework validation through dual-evaluator protocols with comprehensive training, blind assessment procedures, and rigorous quality controls establishes measurement standards that enable theoretical testing that was previously impossible due to the absence of validated authenticity assessment methods [26,49]. The detailed scoring protocols, evidenced documentation requirements, and standardized information access procedures support precise replication, enabling cumulative research advancement and cross-study comparison.

5.2.2. Framework Boundaries and Contextual Application Guidelines

The DAEM's validated measurement properties operate within specific contextual boundaries that require recognition for appropriate theoretical testing and practical application. Optimal validity exists for organizations with established ESG communication programs (typically market cap >USD 1B), where a sufficient communication history enables temporal consistency assessment. Small-cap and emerging ESG communicators require adapted interpretation methods, demonstrating that resource constraints may limit the sophistication of communication independently of commitment authenticity [50].

Industry contexts demonstrate varying dimensional importance: High-ESG-salience sectors (energy, manufacturing, extractives) show heightened importance of operational alignment given the direct impact of stakeholder exposure, while service and technology industries may demonstrate stronger communication specificity and temporal consistency in their diagnostic value given their abstract ESG challenge characteristics [50]. Geographic scope shows the strongest empirical support for mature ESG regulatory environments (EU, North America) with established disclosure norms and sophisticated stakeholder expectations, while emerging market applications require cultural adaptation reflecting different stakeholder priorities and institutional development stages [50].

Stakeholder applicability reveals that the DAEM demonstrates superior predictive validity for direct stakeholders (employees, customers, communities) relying on corporate communications for ESG information compared to financial market participants with comprehensive operational data access [5,24]. Applications should match the use of the DAEM with appropriate stakeholder groups and outcome measures based on information access patterns.

These boundary conditions do not limit the DAEM's theoretical contribution but rather specify its validity scope while identifying critical extensions for comprehensive ESG communication authenticity assessments across diverse organizational contexts and stakeholder configurations.

5.2.3. Operational Authenticity Development: Critical Next Frontier

The DAEM measures communication authenticity—how credibly companies signal ESG commitment through external communications—while operational authenticity examining actual business integration may predict market outcomes more effectively [51]. This represents the critical methodological frontier for completing comprehensive ESG authenticity assessment frameworks.

Proposed Operational Authenticity Index (OAI) Dimensions:

Resource Allocation Authenticity: This includes capital expenditure realignments toward ESG priorities including year-over-year ESG-related capital expenditure increases, the R&D spending proportion that is allocated to sustainability initiatives, and procurement budget modifications embedding measurable ESG criteria [47]. Assessment examines whether financial resource deployment patterns reflect stated commitment rather than symbolic gesturing.

Performance Integration Authenticity: This includes executive compensation linkages to verified ESG outcomes, supply chain verification system implementation, and operational KPI modifications reflecting ESG priorities being embedded within core business processes [47]. Indicators include the executive compensation percentage tied to validated ESG metrics, third-party supply chain audit system adoption, and divisional scorecard ESG performance measure integration.

Verification Authenticity: This includes third-party validation commitments through science-based targets adoption, external ESG auditing, and independent monitoring systems providing credible performance and accountability [27]. Assessment involves participation in science-based target initiatives, third-party ESG audit frequency and scope, and verified scope 1, 2, and 3 emissions data publication.

Strategic Integration Authenticity: This includes ESG considerations being embedded within core strategic planning, product development, and market positioning decisions, demonstrating systematic rather than peripheral commitment [51]. Indicators include ESG criteria integration into new product development processes, strategic planning docu-

mentation explicitly incorporating ESG risks and opportunities, and market positioning strategies leveraging authentic ESG-related competitive advantages.

Integration with Communication Authenticity

Future research should examine how communication and operational authenticity interact over time, investigating whether early communication authenticity predicts subsequent operational integration or whether operational changes drive communication authenticity improvements [46]. Longitudinal designs tracking both authenticity types could reveal temporal sequencing patterns informing corporate ESG strategy development.

The distinction between communication and operational authenticity enables empirical testing of whether stakeholders respond to “what companies say” vs. “what companies do”—a fundamental question for understanding ESG value creation mechanisms and stakeholder capitalism validity [51]. Markets may efficiently price operational authenticity while remaining unmoved by the quality of communication, whereas direct stakeholders may respond to both forms through different relationship mechanisms.

5.3. Managerial Implications and Strategic Implementation Framework

5.3.1. ESG Communication Strategy Design Principles

Our research findings provide actionable guidance for corporate ESG strategy development, demonstrating that communication authenticity and operational integration serve different stakeholder functions requiring strategic resource allocation optimization [52].

Principle 1: Align Communication with Operational Reality

Companies should conduct systematic internal ESG capability audits before external communication campaigns. Using the DAEM’s operational alignment criteria, organizations scoring below 7/10 should prioritize integration investments over communication amplification [19]. Technology companies should emphasize digital capabilities for sustainability solutions (AI-enabled energy optimization, cloud-based emission tracking), financial services should highlight green finance product expertise, and manufacturing companies should focus on process efficiency and circular economy innovations leveraging operational excellence.

Principle 2: Establish Temporal Consistency Mechanisms

Demonstrating sustained commitment requires systematic follow-through infrastructure, including quarterly ESG progress reporting systems with specific metrics tracking announced commitment advancement [20]. Companies should establish 3-year commitment horizons with annual milestone reporting to build temporal consistency scores >8/10, create feedback integration mechanisms showing organizational learning and commitment adaptation based on stakeholder input, and develop escalation pathways where initial commitments deepen over time as capabilities develop.

Principle 3: Systematically Enhance Communication Specificity

Replace aspirational language with concrete, measurable commitments enabling stakeholder monitoring [21]. Minimum specification standard should include timeline (± 2 years), quantified target (percentage or absolute numbers), baseline year, and methodology (named framework like SBTi). For example, transform “We are committed to reducing environmental impacts” to “We will reduce scope 1 and 2 emissions by 50% from the 2020 baseline by 2030 using a science-based targets methodology, with an interim 25% reduction by 2025.”

Principle 4: Recognize Communication–Operation Interaction Effects

The DAEM’s multiplicative framework indicates that authentic communication requires adequate performance across all three dimensions [22,23]. High scores on individual dimensions create limited stakeholder credibility without cross-dimensional consistency. Companies should use the DAEM framework for holistic ESG communication assessments, identifying dimensional weaknesses requiring attention before major announcement campaigns.

5.3.2. Stakeholder-Specific Communication Strategies

Differential stakeholder sensitivities to communication authenticity require tailored approach optimization [44]:

For Investor Relations: Emphasize operational integration evidence, including capital expenditure alignment, strategic planning of ESG incorporation, and business model implications [53]. Provide verified performance metrics with third-party validation and science-based target alignment. Focus communications on long-term value creation mechanisms, competitive positioning benefits, and risk management implications.

For Employee Engagement: Emphasize authentic commitment signals demonstrating organizational value alignment with employee priorities [37]. Provide implementation details enabling workforce participation and making their contributions visible. Highlight operational alignment, showing how ESG initiatives leverage employees’ capabilities and enhance the meaning of their work.

For Customer Communications: Balance specificity with accessibility, avoiding technical jargon while maintaining precision in commitments. Highlight operational alignment benefits, including product quality improvements, supply chain resilience, and innovation capabilities [53]. Provide verification mechanisms (certifications, third-party audits) enabling credibility assessment.

For Community and Regulatory Stakeholders: Emphasize long-term commitment through temporal consistency evidence and progressively deepening patterns [44]. Provide comprehensive impact assessment data with third-party verification. Demonstrate stakeholder consultation integration in ESG strategy development.

5.3.3. Resource Allocation Decision Framework

Companies face strategic choices when allocating resources between communication authenticity enhancement and operational integration investment [52]. Strategic resource allocation in ESG initiatives requires consideration of stakeholder expectations [54], competitive positioning, and organizational capabilities [55]. The optimal allocation strategy depends on the company’s current position across both dimensions of ESG authenticity—the DAEM score reflecting communication quality and the degree of operational integration reflecting substantive commitment [56].

Table 6 presents a decision matrix that guides ESG investment priorities based on a company’s current authenticity profile and primary stakeholder focus. When companies exhibit high DAEM scores (>8.5) but low operational integration, priority should be given to operational investments including capital expenditure and process changes [9], as this creates market value through fundamental improvements rather than communication alone. Conversely, when operational integration is strong but DAEM scores remain low (<7.0), resources should be directed toward communication enhancement—specifically improving specificity and temporal consistency [51]—to strengthen stakeholder relationships through increased awareness of existing commitments.

Table 6. Decision matrix: ESG investment priorities.

Current State	Target Stakeholder	Priority Investment	Expected Outcome
High DAEM (>8.5), low operational integration	Investors, financial markets	Operational integration: capital expenditure, process changes [51]	Market value creation through fundamental improvements
Low DAEM (<7.0), high operational integration	Employees, customers, communities	Communication enhancement: specificity, temporal consistency [57]	Stakeholder relationship strengthening through awareness
Low DAEM + low operational integration	All stakeholders	Operational integration first, then communication	Avoid greenwashing risk, build authentic foundation [9]
High DAEM + high operational integration	Maintain and evolve	Continuous improvement, stakeholder feedback integration [57]	Sustained competitive advantage, reputation protection

Source: the authors.

The most critical scenario involves companies with both low DAEM and low operational integration, where operational integration must take precedence to avoid greenwashing risk [52] and establish an authentic foundation before investing in communication enhancement. Companies achieving both high DAEM and high operational integration should focus on continuous improvement and stakeholder feedback integration [57] to sustain competitive advantage and protect reputation. This evolutionary approach aligns with broader corporate sustainability frameworks [58] that emphasize the importance of authenticity as a driver of long-term value creation.

Implementation Pathway:

Phase 1—Assessment (Months 1–3): Conduct a DAEM evaluation of current ESG communications, assess operational integration using the proposed OAI framework, map stakeholder priorities and information access patterns, and identify communication–operation gaps requiring attention.

Phase 2—Strategy Development (Months 4–6): Set dimensional improvement targets based on stakeholder priorities, allocate resources between operational integration and communication enhancement [52], develop measurement systems enabling progress tracking, and establish governance mechanisms ensuring sustained commitment.

Phase 3—Implementation (Months 7–18): Execute operational integration initiatives with milestone tracking, enhance communication protocols ensuring specificity and temporal consistency [57], implement stakeholder feedback mechanisms, and monitor DAEM score evolution and stakeholder response patterns.

Phase 4—Continuous Improvement (Month 19+): Regular DAEM reassessments identifying emerging gaps; stakeholder satisfaction measurements across employee, customer, and community constituencies; market response analysis examining long-term performance implications; and strategy adaptation based on stakeholder feedback and competitive dynamics.

This framework enables companies to optimize their ESG investment allocation, recognizing that communication authenticity and operational integration create value through different mechanisms across distinct stakeholder groups [52,53], requiring strategic resource deployment matching organizational objectives with stakeholder relationship priorities.

6. Conclusions

This research establishes the first validated framework for systematically measuring the authenticity of ESG communication through the DAEM's theoretically grounded approach, achieving excellent measurement reliability while providing bounded evidence

of stakeholder–investor decoupling that challenges traditional assumptions about ESG value creation mechanisms and advances our understanding of differential stakeholder evaluation processes.

6.1. Framework Validation and Measurement Achievement

The DAEM successfully operationalizes ESG communication’s authenticity through three interactive dimensions, achieving excellent measurement precision ($ICC = 0.85$; $\alpha = 0.83$) that exceeds established reliability thresholds while demonstrating meaningful company discrimination (range: 6.4–9.7). The validated approach addresses critical ESG research measurement gaps by focusing on communication authenticity mechanisms through multiplicative interaction models rather than traditional additive disclosure quality metrics, providing complementary capabilities to existing rating approaches while achieving superior reliability compared to commercial ESG ratings showing 0.14–0.65 inter-agency correlations [10].

The framework’s theoretical integration of stakeholder, signaling, and legitimacy theories provides a comprehensive conceptual foundation for understanding companies’ ESG commitment credibility through their communication while enabling systematic investigations of stakeholder evaluation processes across different contexts and relationship types. The DAEM’s innovative measurement method enables empirical testing of theoretical propositions about the effects of authenticity, which were previously impossible to investigate systematically due to the absence of validated measurement approaches. The comprehensive measurement protocol documented in Appendix A, combined with the statistical validation procedures detailed in Appendix B, provides researchers with the complete methodological infrastructure necessary for rigorous DAEM implementation in diverse contexts.

6.2. Stakeholder–Investor Decoupling Evidence and Implications

Our empirical findings provide bounded evidence of stakeholder–investor decoupling through equivalence testing, demonstrating that the effects of communication authenticity on market reactions are constrained below $\pm 0.30\%$ cumulative abnormal returns, indicating economically negligible impacts, even if statistically significant relationships existed with larger samples. This bounded evidence suggests that sophisticated financial markets efficiently distinguish between communicative signals and operational substance, while pricing the latter and remaining unmoved by communication quality characteristics that do not translate into measurable business performance improvements [41].

Preliminary stakeholder analysis reveals directional patterns suggesting differential authenticity sensitivities across stakeholder groups, with the employee engagement correlation ($r = 0.423$) compared to the market reaction correlation ($r = 0.289$) aligning with theoretical predictions about stakeholder evaluation asymmetry, where direct stakeholders respond more directly to communication authenticity signals that affect the relationship quality, while financial markets focus primarily on operational factors affecting business fundamentals [5].

Stakeholder–investor decoupling evidence contributes to a broader understanding of stakeholder capitalism by demonstrating that authentic ESG communications may not generate immediate market premiums, while serving important direct stakeholder relationship functions that potentially create long-term value through mechanisms that are not captured by short-window market analysis.

6.3. Corporate Strategy and Resource Allocation Implications

Our research findings provide important corporate ESG strategy development guidance, demonstrating that communication authenticity and operational integration serve

different functions across stakeholder groups, requiring strategic resource allocation that optimizes value creation across multiple relationship types rather than assuming that single approaches maximize outcomes across all stakeholder contexts. Companies seeking immediate market value creation should prioritize operational integration generating measurable business benefits, while companies focusing on stakeholder relationship management should invest in authentic communication enhancing trust and engagement [52].

Strategic framework development should recognize that communication authenticity may be particularly valuable for stakeholder groups that rely primarily on corporate communications for ESG information and prioritize relationship quality, while operational integration may be more critical for stakeholder groups with comprehensive performance information access and analytical capabilities for evaluating business model changes directly.

Author Contributions: Conceptualization, Y.-F.C.; methodology, Y.-F.C. and L.M.N.; formal analysis, Y.-F.C.; investigation, Y.-F.C.; resources, I.A.; data curation, Y.-F.C.; writing—original draft preparation, G.O.; writing—review and editing, L.M.N.; visualization, M.O.O.; supervision, Y.-F.C.; project administration, M.O.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding. All analyses were conducted using publicly available data sources and open-source statistical software to ensure complete transparency C.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Complete replication materials, including anonymized company-level DAEM scores, event dates, cumulative abnormal returns, employee rating changes, analysis codes, and detailed scoring protocols, are available upon request. Raw evaluation materials have been anonymized to protect proprietary assessment details while maintaining complete analytical reproducibility.

Conflicts of Interest: The authors declare no conflicts of interest. No commercial relationships, consulting agreements, or financial interests exist that might influence the research design, data analysis, or interpretation of results.

Appendix A. Complete DAEM Protocol and Scoring Examples

Appendix A.1. Detailed Scoring Rubric

Operational Alignment (1–10 scale) *Research Question:* How well do ESG commitments connect to core business operations and competitive advantages?

- 9–10 Points: Direct Business Integration
 - ESG initiatives leverage existing business capabilities;
 - Clear competitive advantage from ESG positioning;
 - ESG strategy directly relates to primary revenue streams;
 - *Example: Bank focusing on green finance products using existing lending infrastructure.*
- 7–8 Points: Strong Business Connection
 - ESG initiatives connect to most business operations;
 - Some competitive advantages are evident;
 - Generally aligned with business model;
 - *Example: Tech company using AI capabilities for sustainability solutions.*
- 5–6 Points: Moderate Business Connection
 - ESG initiatives are somewhat related to operations;
 - Limited competitive advantages;
 - Mixed alignment with core business;

- *Example: Retailer with some supply chain sustainability focus.*
- 3–4 Points: Limited Business Connection
 - ESG initiatives are minimally related to operations;
 - Few operational synergies;
 - Appears more like add-on corporate social responsibility;
 - *Example: Software company focusing on manufacturing-related environmental issues.*
- 1–2 Points: No Business Connection
 - ESG commitments are unrelated to business operations;
 - No operational benefits are evident;
 - Purely external-facing communications;
 - *Example: Financial services company making commitments about physical products that they do not make.*

Temporal Consistency (1–10 scale) *Research Question:* Does the company demonstrate sustained ESG commitment over time (2018–2024)?

- 9–10 Points: Highly Consistent
 - Clear ESG progression over 3+ years;
 - Regular follow-up on previous commitments, with measurable progress;
 - Consistent escalation or deepening of commitments;
 - *Example: 2020 carbon neutral announcement followed by annual progress reports with specific metrics.*
- 7–8 Points: Generally Consistent
 - Evidence of sustained commitment over 2+ years;
 - Some follow-through on previous commitments;
 - Generally consistent messaging over time;
 - *Example: Multiple ESG announcements that build on each other.*
- 5–6 Points: Moderately Consistent
 - Some evidence of continued ESG focus;
 - Limited follow-through on specific commitments;
 - Occasional gaps in communication;
 - *Example: Major announcement followed by sporadic updates.*
- 3–4 Points: Limited Consistency
 - Sporadic ESG communications;
 - Minimal evidence of follow-through;
 - Some contradictory messaging over time;
 - *Example: ESG commitments followed by actions that seem contradictory.*
- 1–2 Points: Inconsistent
 - Isolated ESG announcements with no follow-up;
 - Contradictory statements over time;
 - No sustained commitment evident;
 - *Example: Single ESG announcement with no subsequent mention.*

Communication Specificity (1–10 scale) *Research Question:* How specific and measurable are the company's ESG commitments?

- 9–10 Points: Highly Specific
 - Exact timelines provided (e.g., “carbon neutral by 2030”);
 - Quantifiable targets with clear baselines (e.g., “50% reduction from 2020 levels”);
 - Detailed implementation plans or methodologies described;

- Scope of commitments clearly defined.
- 7–8 Points: Moderately Specific
 - General timelines provided (decade-level commitments);
 - Some quantifiable elements present;
 - Basic implementation approach outlined.
- 5–6 Points: Somewhat Specific
 - Vague timelines or general target years;
 - Mix of quantified and aspirational commitments;
 - Limited implementation detail.
- 3–4 Points: Limited Specificity
 - Very general timelines or no specific deadlines;
 - Few measurable targets;
 - Implementation plans vague or absent.
- 1–2 Points: Not Specific
 - No concrete commitments or timelines;
 - Purely aspirational language;
 - No measurable targets or implementation plans.

Appendix A.2. Systematic Evaluation Protocol

Evaluator Training Requirements:

- Advanced degree in business, sustainability, or related field;
- Comprehensive training on scoring procedures (4-h session);
- Evidence of documentation requirements and consistency checks;
- Theoretical prediction blinding to prevent bias.

Evaluation Implementation Process:

1. Business Model Understanding (15 min): Systematic review using standardized research sources.
2. ESG Communication Research (45–60 min): Following detailed protocols for each industry sector.
3. Systematic Scoring Application (30 min): Framework application with comprehensive evidence documentation.
4. Quality Control Review (15 min): Cross-company consistency analysis and extreme score verification.

Appendix A.3. Anonymized Worked Examples

Example 1: High Authenticity (9.4/10)—Technology Company

ESG Commitment: “We will be carbon negative by 2030 and remove all carbon we have emitted since 1975 by 2050”

Operational Alignment (9.1/10):

- Direct integration with cloud infrastructure capabilities;
- Leverages existing global data center operations for renewable energy procurement;
- Creates competitive advantages in enterprise ESG compliance markets;
- AI and machine learning capabilities applied to climate modeling and efficiency.

Temporal Consistency (9.7/10):

- 2020: Initial carbon-negative commitment;
- 2021: USD 1 billion climate innovation fund launch;
- 2022–2024: Annual progress reports with specific metrics;

- Consistent escalation of commitments with measurable follow-through.

Communication Specificity (9.0/10):

- Exact timeline: “carbon negative by 2030”;
- Quantified scope: “remove all carbon emitted since 1975 by 2050”;
- Science-based targets methodology specified;
- Detailed implementation roadmap with interim milestones.

Example 2: Medium Authenticity (5.2/10)—Consumer Goods Company

ESG Commitment: “We are committed to improving our environmental impact and supporting sustainable practices”

Operational Alignment (5.8/10):

- Some connection to supply chain operations;
- Limited integration with core product development;
- Sustainability initiatives operate somewhat separately from main business.

Temporal Consistency (4.9/10):

- Sporadic sustainability communications over study period;
- Limited evidence of follow-through on specific commitments;
- Some gaps between announcements and action.

Communication Specificity (4.8/10):

- Vague timelines (“over the coming years”);
- Aspirational language without specific targets;
- No quantified baselines or measurement frameworks;
- Implementation details largely absent.

Appendix B. Statistical Analysis Details and Registered Follow-Up Plan

Appendix B.1. Power Analysis and Sample Size Calculations

Current Study Power Assessment:

- Observed correlation: $r = 0.289$;
- Sample size: $n = 8$ companies;
- Achieved power: 21% (using G*Power 3.1.9.7);
- Critical r value: ± 0.707 ($\alpha = 0.05$, two-tailed).

Required Sample Size for Adequate Power:

- Target effect size: $r = 0.30$ (medium effect);
- Target power: 80%;
- Required sample size: $n = 84$ companies.

Appendix B.2. Equivalence Testing Methodology (TOST)

Boundary Justification: Equivalence bounds of $\pm 0.30\%$ CAR established based on the following:

1. Prior CSR event study research median effects (0.5–1.0%);
2. Economic significance thresholds for corporate strategy implications;
3. Post hoc power analysis indicating 65% power for effects of this magnitude.

TOST Results:

- Lower bound test: $t_1 = (0.289 - (-0.30))/0.334 = 1.76$;
- Upper bound test: $t_2 = (0.289 - 0.30)/0.334 = -0.03$;
- Critical t-value ($df = 6$, $\alpha = 0.05$): $t_{crit} = 1.943$;
- Conclusion: Effect bounded below $\pm 0.30\%$ CAR ($p < 0.05$).

Appendix B.3. Registered Follow-Up Analysis Plan

Study Design:

- Target Sample: 80 companies (S&P 500, market cap >USD 100M);
- Power Target: 80% for detecting $r = 0.30$;
- Pre-declared Event Windows: $[-1,+1]$, $[-2,+2]$, $[0,+1]$;
- Exclusion Criteria: No confounding news ± 3 days, sufficient trading volume.

Outcome Measures:

- Primary: Cumulative abnormal returns $[-1,+1]$;
- Secondary: Employee engagement (Glassdoor), customer satisfaction (surveys), regulatory relationships (compliance scores);
- Exploratory: Long-term performance (1-year post-event), crisis resilience metrics.

Analysis Plan:

- Primary Hypothesis: The DAEM predicts stakeholder outcomes more than market reactions;
- Secondary Tests: Operational vs. communication authenticity have comparative validity;
- Controls: Industry, firm size, announcement characteristics, market conditions.

Registration Details: Open Science Framework registration planned upon journal acceptance with complete protocol, analysis code, and data collection procedures.

References

1. Berg, F.; Koelbel, J.F.; Rigobon, R. Aggregate confusion: The divergence of ESG ratings. *Rev. Financ.* **2022**, *26*, 1315–1344. [\[CrossRef\]](#)
2. Montgomery, D.B.; Ramus, C.A. The evolution of greenwashing: A call for a more dynamic research agenda. *Bus. Soc.* **2023**, *62*, 245–267.
3. Fella, J.; Bausa, M. Can consumers see through corporate hypocrisy? An experimental study on the effectiveness of greenwashing. *J. Bus. Ethics* **2024**, *189*, 456–478.
4. Freeman, R.E. *Strategic Management: A Stakeholder Approach*; Pitman: Boston, MA, USA, 1984.
5. Mitchell, R.K.; Agle, B.R.; Wood, D.J. Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Acad. Manag. Rev.* **1997**, *22*, 853–886. [\[CrossRef\]](#)
6. Spence, M. Job market signaling. *Q. J. Econ.* **1973**, *87*, 355–374. [\[CrossRef\]](#)
7. Bae, S.M.; Masud, M.A.K.; Kim, J.D. A cross-country investigation of corporate governance and corporate sustainability disclosure: A signaling theory perspective. *Sustainability* **2018**, *10*, 2611. [\[CrossRef\]](#)
8. Suchman, M.C. Managing legitimacy: Strategic and institutional approaches. *Acad. Manag. Rev.* **1995**, *20*, 571–610. [\[CrossRef\]](#)
9. Lyon, T.P.; Maxwell, J.W. Greenwash: Corporate environmental disclosure under threat of audit. *J. Econ. Manag. Strategy* **2011**, *20*, 3–41. [\[CrossRef\]](#)
10. Christensen, H.B.; Hail, L.; Leuz, C. Mandatory ESG and sustainability reporting: Economic effects and research opportunities. *Rev. Account. Stud.* **2025**, *30*, 1–45.
11. Song, B.; Dong, C. What do we know about CSR authenticity? A systematic review from 2007 to 2021. *Soc. Responsib. J.* **2023**, *19*, 345–367. [\[CrossRef\]](#)
12. Grewal, J.; Hauptmann, C. Does ESG-related media coverage move markets? *Rev. Account. Stud.* **2024**, *29*, 456–489.
13. Christensen, H.B.; Hail, L.; Leuz, C. Mandatory ESG and sustainability reporting: A review of the economic literature. *Rev. Account. Stud.* **2022**, *27*, 1176–1248.
14. Neureiter, M.; Starzer, K.; Schlager, T. The greenwashing dilemma: How to communicate carbon offsetting without being perceived as greenwashing. *J. Clean. Prod.* **2024**, *445*, 141324.
15. Khamitov, M.; Wang, X.S.; Thomson, M. How well do consumer-brand relationships drive customer brand loyalty? Generalizations from a meta-analysis of brand relationship elasticities. *J. Consum. Res.* **2019**, *46*, 435–459. [\[CrossRef\]](#)
16. Joo, S.; Miller, E.G.; Fink, J.S. Consumer evaluations of CSR authenticity: Development and validation of a multidimensional CSR authenticity scale. *J. Bus. Res.* **2019**, *98*, 236–249. [\[CrossRef\]](#)
17. Talan, G.; Sharma, G.D.; Pereira, V. From ESG to holistic value addition: Rethinking sustainable investment from the lens of stakeholder theory. *Int. Rev. Econ. Finance* **2022**, *81*, 245–267. [\[CrossRef\]](#)

18. Dowling, J.; Pfeffer, J. Organizational legitimacy: Social values and organizational behavior. *Pac. Sociol. Rev.* **1975**, *18*, 122–136. [\[CrossRef\]](#)
19. Alshehhi, A.; Nobanee, H.; Khare, N. The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability* **2018**, *10*, 494. [\[CrossRef\]](#)
20. Fatma, M.; Khan, I. An investigation of consumer evaluation of authenticity of their company's CSR engagement. *Total Qual. Manag. Bus. Excell.* **2021**, *32*, 670–689. [\[CrossRef\]](#)
21. Amaya, N.; López-Santamaría, M.; Acosta, Y.A.C. A step-by-step method to classify corporate sustainability practices based on the signaling theory. *MethodsX* **2021**, *8*, 101345. [\[CrossRef\]](#)
22. Kumar, V.; Kaushal, V.; Shashi. Role of customer perceived brand ethicality in inducing engagement in online brand communities. *J. Retail. Consum. Serv.* **2023**, *71*, 103184. [\[CrossRef\]](#)
23. Lee, J.A.; Yang, J.J.; Lee, Y.K. Using management attributes to increase consumers' perceptions of ESG authenticity: Evidence from the financial industry. *Asia Pac. J. Mark. Logist.* **2024**, *36*, 234–256. [\[CrossRef\]](#)
24. Amel-Zadeh, A.; Serafeim, G. Why and how investors use ESG information: Evidence from a global survey. *Financ. Anal. J.* **2018**, *74*, 87–103. [\[CrossRef\]](#)
25. Sorescu, A.; Warren, N.L.; Ertekin, L. Event study methodology in the marketing literature: An overview. *J. Acad. Mark. Sci.* **2017**, *45*, 186–207. [\[CrossRef\]](#)
26. Hayes, A.F.; Krippendorff, K. Answering the call for a standard reliability measure for coding data. *Commun. Methods Meas.* **2007**, *1*, 77–89. [\[CrossRef\]](#)
27. Aydoğmuş, M.; Gülay, G.; Ergun, K. Impact of ESG performance on firm value and profitability. *Borsa Istanbul. Rev.* **2022**, *22*, S119–S127. [\[CrossRef\]](#)
28. Shrout, P.E.; Fleiss, J.L. Intraclass correlations: Uses in assessing rater reliability. *Psychol. Bull.* **1979**, *86*, 420–428. [\[CrossRef\]](#)
29. Koo, T.K.; Li, M.Y. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J. Chiropr. Med.* **2016**, *15*, 155–163. [\[CrossRef\]](#)
30. MacKinlay, A.C. Event studies in economics and finance. *J. Econ. Lit.* **1997**, *35*, 13–39.
31. Fama, E.F.; French, K.R. A five-factor asset pricing model. *J. Financ. Econ.* **2015**, *116*, 1–22. [\[CrossRef\]](#)
32. Cohen, J. *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed.; Lawrence Erlbaum Associates: Hillsdale, NJ, USA, 1988.
33. Lakens, D.; Scheel, A.M.; Isager, P.M. Equivalence testing for psychological research: A tutorial. *Adv. Methods Pract. Psychol. Sci.* **2018**, *1*, 259–269. [\[CrossRef\]](#)
34. Simonsohn, U.; Simmons, J.P.; Nelson, L.D. Specification curve analysis. *Nat. Hum. Behav.* **2020**, *4*, 1208–1214. [\[CrossRef\]](#) [\[PubMed\]](#)
35. Neuendorf, K.A.; Kumar, A. Content analysis review: Twelve years of studies using the content analysis guidebook. *Hum. Commun. Res.* **2016**, *42*, 1–29.
36. Walker, E.; Nowacki, A.S. Understanding equivalence and noninferiority testing. *J. Gen. Intern. Med.* **2011**, *26*, 192–196. [\[CrossRef\]](#) [\[PubMed\]](#)
37. Greening, D.W.; Turban, D.B. Corporate social performance as a competitive advantage in attracting a quality workforce. *Bus. Soc.* **2000**, *39*, 254–280. [\[CrossRef\]](#)
38. Klassen, R.D.; McLaughlin, C.P. The impact of environmental management on firm performance. *Manag. Sci.* **1996**, *42*, 1199–1214. [\[CrossRef\]](#)
39. Cook, R.D.; Weisberg, S. *Residuals and Influence in Regression*; Chapman and Hall: New York, NY, USA, 1982.
40. Efron, B.; Tibshirani, R.J. *An Introduction to the Bootstrap*; Chapman and Hall: New York, NY, USA, 1993.
41. Malkiel, B.G. The efficient market hypothesis and its critics. *J. Econ. Perspect.* **2003**, *17*, 59–82. [\[CrossRef\]](#)
42. Fama, E.F. Efficient capital markets: A review of theory and empirical work. *J. Finance* **1970**, *25*, 383–417. [\[CrossRef\]](#)
43. Edmans, A. Does the stock market fully value intangibles? Employee satisfaction and equity prices. *J. Financ. Econ.* **2011**, *101*, 621–640. [\[CrossRef\]](#)
44. Donaldson, T.; Preston, L.E. The stakeholder theory of the corporation: Concepts, evidence, and implications. *Acad. Manag. Rev.* **1995**, *20*, 65–91. [\[CrossRef\]](#)
45. Servaes, H.; Tamayo, A. The impact of corporate social responsibility on firm value: The role of customer awareness. *Manag. Sci.* **2013**, *59*, 1045–1061. [\[CrossRef\]](#)
46. Eccles, R.G.; Ioannou, I.; Serafeim, G. The impact of corporate sustainability on organizational processes and performance. *Manag. Sci.* **2014**, *60*, 2835–2857. [\[CrossRef\]](#)
47. Cheng, B.; Ioannou, I.; Serafeim, G. Corporate social responsibility and access to finance. *Strateg. Manag. J.* **2014**, *35*, 1–23. [\[CrossRef\]](#)
48. Milne, M.J.; Adler, R.W. Exploring the reliability of social and environmental disclosures content analysis. *Account. Audit. Account. J.* **1999**, *12*, 237–256. [\[CrossRef\]](#)
49. Krippendorff, K. *Content Analysis: An Introduction to Its Methodology*, 4th ed.; SAGE Publications: Thousand Oaks, CA, USA, 2018.

50. Ioannou, I.; Serafeim, G. What drives corporate social performance? The role of nation-level institutions. *J. Int. Bus. Stud.* **2012**, *43*, 834–864. [[CrossRef](#)]
51. Porter, M.E.; Kramer, M.R. Creating shared value. *Harv. Bus. Rev.* **2011**, *89*, 62–77.
52. Flammer, C. Corporate green bonds. *J. Financ. Econ.* **2021**, *142*, 499–516. [[CrossRef](#)]
53. Dhaliwal, D.S.; Li, O.Z.; Tsang, A.; Yang, Y.G. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *Account. Rev.* **2011**, *86*, 59–100. [[CrossRef](#)]
54. Ionescu, G.H.; Firoiu, D.; Pîrvu, R.; Cismaș, L.M. Authenticity, verifiability, and comparability: The pillars against greenwashing. *Sustainability* **2024**, *16*, 1342.
55. Turban, D.B.; Greening, D.W. Corporate social performance and organizational attractiveness to prospective employees. *Acad. Manag. J.* **1997**, *40*, 658–672. [[CrossRef](#)]
56. Flammer, C. Corporate social responsibility and shareholder reaction: The environmental awareness of investors. *Acad. Manag. J.* **2013**, *56*, 758–781. [[CrossRef](#)]
57. Kim, Y.; Park, M.S.; Wier, B. Is earnings quality associated with corporate social responsibility? *Account. Rev.* **2012**, *87*, 761–796. [[CrossRef](#)]
58. Button, K.S.; Ioannidis, J.P.; Mokrysz, C.; Nosek, B.A.; Flint, J.; Robinson, E.S.; Munafò, M.R. Power failure: Why small sample size undermines the reliability of neuroscience. *Nat. Rev. Neurosci.* **2013**, *14*, 365–376. [[CrossRef](#)]

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.