Two Essays on Corporate Greenwashing and Financial Reporting Quality

A Thesis Presented in Partial Fulfilment of the Requirements for the Degree of

Master of Business Studies in Accountancy

School of Accountancy, Economics & Finance

Massey Business School

Massey University

Xinying Qiu

2026

ABSTRACT

This thesis comprises two essays examining the intersection between corporate greenwashing and financial reporting quality using a comprehensive panel of U.S. publicly listed firms from 2003 to 2024. As sustainability disclosure has expanded dramatically over the past two decades, concerns about greenwashing, i.e., the strategic misrepresentation of environmental responsibility, have intensified. Yet the relationship between environmental impression management and core attributes of financial reporting remains underexplored. This thesis addresses that gap by investigating how greenwashing interacts with two fundamental dimensions of financial reporting quality: conditional accounting conservatism and earnings management.

The first essay examines the relation between conditional accounting conservatism and corporate greenwashing. Drawing on an integrated theoretical framework combining institutional theory and impression management theory, I argue that conservative financial reporting and environmental impression management are not substitutes but complementary responses to divergent institutional pressures across reporting domains. Using the Khan and Watts (2009) C-score to measure conditional conservatism and a gap-model-based GW-score to capture the divergence between environmental disclosure and actual environmental performance, I document a positive and statistically significant association between the two constructs. This finding is robust to alternative conservatism proxies, lagged specifications, two-stage least squares (2SLS) instrumental variable estimation, two-stage residual inclusion (2SRI) endogeneity correction, and propensity score matching. The evidence suggests that firms operating under stringent financial reporting discipline retain substantial latitude to engage in environmental impression management through the comparatively unregulated terrain of sustainability disclosure, underscoring a structural decoupling between financial and non-financial reporting governance.

The second essay investigates the relationship between earnings management and corporate greenwashing intensity. Grounded in institutional theory and impression management theory, I hypothesize that greenwashing and earnings management represent complementary forms of strategic corporate impression management operating in different reporting domains. I estimate discretionary accruals via both the Modified Jones model and the performance-matched model of Kothari *et al.* (2005). My baseline results indicate that greenwashing intensity is positively and significantly associated with discretionary accruals across all specifications. I further address endogeneity concerns through lagged regressions, 2SLS, and 2SRI approaches, all of which

corroborate my main findings. Cross-sectional analyses reveal that Big 4 audit quality and board diversity unexpectedly strengthen the greenwashing-earnings management nexus.

Collectively, the two essays demonstrate that corporate greenwashing is not an isolated public relations strategy but is systematically associated with fundamental attributes of financial reporting. Firms that mislead stakeholders about their environmental performance exhibit both higher conditional conservatism and higher discretionary accruals, suggesting that managers treat financial and non-financial reporting as distinct strategic arenas subject to different incentive structures and monitoring intensities. These findings carry important implications for regulators, investors, and standard setters seeking to improve the integrity of corporate communication across both domains.

ACKNOWLEDGEMENTS

I am profoundly grateful to my supervisors, Professor Noor Houqe and Dr. FJ Mohaimen, for their extraordinary mentorship throughout this research journey. Their guidance was instrumental in shaping both the intellectual direction and methodological rigour of this thesis. Beyond their academic expertise, they demonstrated remarkable kindness and patience during periods when I faced family difficulties and personal challenges. They were always ready to offer support, encouragement, and understanding, never failing to remind me that perseverance would see me through. They have been exceptionally generous with their time and support, and they taught me a great deal throughout this process. I have learned so much from them, not only about accounting research but also about resilience and scholarly integrity. Their dedication to my development as a researcher has left an indelible mark on my academic career, and I feel truly fortunate to have had the opportunity to work under their supervision.

I also wish to express my deepest gratitude to my family. To my husband, Michael Liu, thank you for your unwavering love, patience, and sacrifice. You have been my anchor, providing the emotional and practical support necessary to complete this work. To my beloved daughter, Elsie Liu, thank you for bringing endless joy and perspective to my life. Your smiles reminded me daily of what truly matters. Without the support of my family, this thesis would not have been possible.

Finally, I thank Massey University and the School of Accountancy, Economics and Finance for providing the resources and intellectual environment that made this research possible.

TABLE OF CONTENTS

LIST OF TABLES

Chapter Two: Essay One

Chapter Three: Essay Two

Chapter One: Introduction

1.1 Background and motivation

The past two decades have witnessed an unprecedented expansion in corporate sustainability disclosure. Investors, regulators, and consumers now routinely evaluate firms not only on financial performance but also on environmental, social, and governance criteria, prompting a proliferation of standalone sustainability reports, carbon commitments, and green marketing campaigns. Yet a growing body of evidence indicates that much of this disclosure activity constitutes greenwashing, i.e., the strategic practice of conveying a misleading impression of environmental responsibility through selective, exaggerated, or unsubstantiated communication. Greenwashing represents a form of impression management in the non-financial domain, allowing firms to cultivate legitimacy and reap reputational benefits without incurring the costs of genuine environmental improvement.

Parallel to the rise of sustainability reporting (Eccles *et al.,* 2014), financial reporting quality has remained a central concern for capital market participants. Conditional accounting conservatism, rooted in the asymmetric timeliness framework of Basu (1997), refers to the differential speed with which accountants recognize economic losses relative to gains, and has been shown to mitigate agency conflicts and constrain earnings management. Similarly, the literature on earnings management has extensively documented how managers use discretionary accruals to achieve desired financial reporting outcomes, from smoothing earnings to meeting analyst forecasts. These two strands of research, i.e., conservatism and earnings management, have developed largely independently of the greenwashing literature, leaving a critical gap in understanding of how environmental impression management relates to core attributes of financial disclosure integrity.

This gap is theoretically significant because the institutional mechanisms governing financial and environmental reporting differ markedly. Financial reporting in the United States (U.S.) operates under mandatory compliance with Generally Accepted Accounting Principles (GAAP), Securities and Exchange Commission (SEC) enforcement, and rigorous auditor gatekeeping. These structures create high expected costs for accrual manipulation and promote the adoption of conservative reporting norms. By contrast, environmental and sustainability reporting has historically been governed by fragmented, weakly enforced standards with no direct analogue to the hard verification constraints of financial accounting. Disclosure remains largely voluntary,

standards are heterogeneous, and third-party assurance is limited. This institutional asymmetry (i.e., a tightly coupled financial reporting field alongside a loosely coupled environmental disclosure field) creates the structural conditions for decoupling. Firms may achieve genuine conformity with financial reporting demands while simultaneously engaging in ceremonial adoption within the environmental domain.

Understanding the nature of this decoupling is essential for regulators currently harmonizing sustainability disclosure standards, for investors seeking to assess overall reporting quality, and for scholars aiming to build integrated theories of corporate transparency. This thesis addresses the gap by examining the relationship between corporate greenwashing and two fundamental dimensions of financial reporting quality, namely, conditional accounting conservatism and earnings management, using a comprehensive panel of U.S. publicly listed firms from 2003 to 2024. By investigating these relationships through distinct but complementary theoretical lenses, this research seeks to determine whether greenwashing is an isolated communication strategy or part of a broader corporate reporting orientation that spans both financial and non-financial domains.

1.2 Aim and objectives of the research

The overarching aim of this research is to examine the intersection between corporate greenwashing and financial reporting quality, and to assess whether environmental impression management coexists with, or is constrained by, fundamental attributes of financial disclosure integrity. To achieve this aim, the thesis pursues four specific objectives:

First, to examine whether conditional accounting conservatism is positively or negatively associated with corporate greenwashing intensity, and to identify the theoretical mechanisms (e.g., institutional theory and impression management theory) that explain this relationship.

Second, to investigate whether corporate greenwashing is associated with higher levels of discretionary accruals, and to establish whether greenwashing signals a broader opportunistic reporting orientation that extends beyond environmental disclosures into the domain of financial reporting.

Third, to examine the moderating roles of corporate governance mechanisms (i.e., Big 4 audit quality and board diversity) in shaping the relationship between greenwashing and earnings management.

Fourth, to provide robust causal evidence on these associations by employing a comprehensive battery of econometric techniques, including lagged-variable specifications, two-stage least squares instrumental variable estimation, two-stage residual inclusion control function approaches, and propensity score matching.

1.3 Contributions of the research

1.3.1 Essay 1

The first essay contributes to the accounting conservatism literature by identifying corporate greenwashing as a significant correlate of conditional conservatism. Prior research has examined how conservatism interacts with earnings management, investment efficiency, and debt contracting, yet the possibility that conservatism coexists with environmental misrepresentation has not been systematically investigated. This essay demonstrates that firms with higher conditional conservatism exhibit significantly higher greenwashing intensity, suggesting that financial reporting does not necessarily spill over into the sustainability domain. Theoretically, institutional theory, and specifically the concept of decoupling, informs this finding by explaining how tightly coupled governance in one reporting domain can predict loosely coupled symbolic behavior in another. The essay further demonstrates that this association is robust to alternative conservatism proxies, temporal ordering, and multiple endogeneity corrections. Practically, the results caution regulators and investors against assuming that conservative accounting practices signal high integrity across all disclosure domains.

1.3.2 Essay 2

The second essay extends the greenwashing literature by establishing a direct link between corporate greenwashing and accrual-based earnings management. While prior research has documented greenwashing as an impression management strategy in the non-financial domain, this essay demonstrates that such behavior extends into the financial reporting domain. By identifying greenwashing as a significant predictor of discretionary accruals, the essay suggests that stakeholders should view greenwashing not merely as an environmental communication issue but as a signal of potential financial reporting aggressiveness. Additionally, the moderation analyses offer nuanced insights into institutional conditions: the unexpected finding that Big 4 audit quality strengthens rather than weakens the greenwashing-earnings management nexus challenges conventional governance assumptions, while the role of board diversity highlights the complexity of monitoring coordinated impression management across domains.

1.3.3 Main findings

Across both essays, the central finding is that corporate greenwashing is systematically associated with key attributes of financial reporting, though the nature of these associations reveals the complexity of cross-domain corporate behavior. Essay 1 documents a positive association between greenwashing and conditional accounting conservatism, a financial reporting attribute typically viewed as a governance mechanism that constrains managerial opportunism. Essay 2 documents a positive association between greenwashing and discretionary accruals, a direct measure of financial reporting manipulation. These convergent results suggest that greenwashing is not an isolated public relations strategy but rather part of a broader corporate reporting orientation in which managers exploit the differential institutional pressures across financial and environmental disclosure domains.

Specifically, the evidence supports a domain-specific displacement argument: firms subject to stringent financial reporting discipline redirect impression management efforts toward the less regulated terrain of sustainability communication, while firms engaged in environmental misrepresentation simultaneously exhibit greater propensity for accrual manipulation. Collectively, the findings underscore a structural decoupling between financial and non-financial reporting governance, with direct implications for the ongoing efforts of the International Sustainability Standards Board and the U.S. SEC to harmonize sustainability disclosure standards.

1.4 Outline of the research

The remainder of this thesis is organized as follows. Chapter 2 presents the first essay, which examines the relationship between conditional accounting conservatism and corporate greenwashing among U.S. listed firms from 2003 to 2024. Chapter 3 presents the second essay, which investigates the relationship between earnings management and corporate greenwashing intensity over the same sample period. Together, these chapters provide a comprehensive examination of how environmental impression management intersects with financial reporting quality across two distinct but related dimensions.

Chapter Two – Essay One: Conditional Accounting Conservatism and Corporate Greenwashing: Evidence from U.S. Listed Firms

Abstract

This study examines the relation between conditional accounting conservatism and corporate greenwashing among U.S. publicly listed firms over the period 2003 to 2024. Drawing on an integrated theoretical framework that combines institutional theory and impression management theory, I argue that conservative financial reporting and environmental impression management are not substitutes but rather complementary responses to divergent institutional pressures across reporting domains. Using the Khan and Watts (2009) C-score to measure conditional conservatism and a gap-model-based GW-score to capture the divergence between environmental disclosure and environmental performance, I document a positive and statistically significant association between the two constructs. This finding is robust to alternative conservatism proxies, including the Basu (1997) asymmetric timeliness coefficient and the net conservatism score (CG-score), as well as to a lagged-dependent-variable specification, two-stage least squares instrumental variable estimation, two-stage residual inclusion endogeneity correction, and propensity score matching. Collectively, the evidence suggests that firms operating under stringent financial reporting discipline retain substantial latitude to engage in environmental impression management through the comparatively unregulated terrain of sustainability disclosure, underscoring a structural decoupling between financial and non-financial reporting governance. My results carry important implications for regulators, investors, and standard setters seeking to improve the integrity of corporate environmental communication.

JEL Classifications: M41, M14, G32, Q56

Keywords: *Conditional conservatism, C-score, greenwashing, environmental disclosure, institutional theory, impression management theory*

1. Introduction

The past two decades have witnessed an unprecedented expansion in corporate sustainability disclosure. Investors, regulators, and consumers now routinely evaluate firms not only on financial performance but also on environmental, social, and governance criteria, prompting a proliferation of standalone sustainability reports, carbon commitments, and green marketing campaigns (Eccles *et al.,* 2014; Frankel *et al.,* 2025; Kolk and Perego, 2010; Xue, 2025). Yet a growing body of evidence indicates that much of this disclosure activity constitutes greenwashing, defined as the strategic practice of conveying a misleading impression of environmental responsibility through selective, exaggerated, or unsubstantiated communication (Kim and Lyon, 2015; Lyon and Maxwell, 2011; Lu *et al.,* 2025; Marquis *et al.,* 2016). Greenwashing represents a form of impression management in the non-financial domain, allowing firms to cultivate legitimacy and reap reputational benefits without incurring the costs of genuine environmental improvement (Cho and Patten, 2007; Delmas and Burbano, 2011).

Parallel to the rise of sustainability reporting (Eccles *et al.,* 2014), conditional accounting conservatism has remained a foundational attribute of financial reporting quality. Rooted in the asymmetric timeliness framework of Basu (1997), conditional conservatism refers to the differential speed with which accountants recognize economic losses relative to gains, and it has been shown to mitigate agency conflicts, reduce debt costs, and constrain earnings management (Ahmed *et al.,* 2002; Baloria, 2022; Garcia Lara *et al.,* 2016, 2020; Watts, 2003a). The Khan and Watts (2009) firm-year-specific C-score has become the standard measure for capturing cross-sectional and temporal variation in conservatism, enabling researchers to examine how this reporting attribute interacts with other firm-level constructs.

Despite the extensive literatures on conservatism, the relationship between these two domain-specific reporting choices remains unexplored. At first glance, one might expect conservatism, a governance mechanism that constrains managerial opportunism in financial reporting, to spill over into the sustainability domain, reducing the incidence of greenwashing. Alternatively, if managerial impression management is constrained by the hard verification standards governing financial statements, managers may redirect discretionary disclosure toward the softer, less regulated terrain of environmental communication, rendering conservatism and greenwashing complements rather than substitutes. This theoretical tension motivates my central

research question: Are conditional accounting conservatism and corporate greenwashing positively or negatively associated?

I develop my argument through two complementary theoretical lenses. First, institutional theory (DiMaggio and Powell, 1983; Scott, 1995) provides a powerful explanatory framework for understanding how differential institutional pressures across reporting domains shape corporate disclosure behavior. Recent empirical work is broadly consistent with this institutional logic without itself constituting institutional theory: Krueger *et al.* (2024) show that mandatory ESG disclosure improves stock liquidity most where enforcement is strong, Fiechter *et al.* (2022) document real effects of a mandatory CSR reporting regime, and Christensen *et al.* (2022) show that ESG ratings diverge systematically across rating agencies. The theory posits that organizations operate within institutional fields characterized by distinct normative, coercive, and mimetic pressures. In the U.S., the financial reporting field exhibits tight institutional coupling. Mandatory GAAP compliance, SEC enforcement, and rigorous auditor gatekeeping create high expected costs for manipulation and promote genuine convergence in reporting practices, including the adoption of conservative norms (Ball and Shivakumar, 2005; Lamoreaux *et al.,* 2023; Watts, 2003a). By contrast, the environmental disclosure field remains loosely coupled, governed by fragmented, largely voluntary standards with limited third-party assurance (Christensen *et al.,* 2022; Kim and Lyon, 2015; Marquis *et al.,* 2016). This institutional asymmetry creates structural conditions for decoupling, whereby firms can simultaneously achieve genuine conformity in financial reporting while engaging in ceremonial adoption within the environmental domain (Bromley and Powell, 2012). Recent evidence that firms divest pollutive assets without reducing actual pollution while simultaneously earning higher ESG ratings (Duchin *et al.,* 2025), and that voluntary sustainability standards increase disclosure volume without necessarily eliminating greenwashing (Bochkay *et al.,* 2025), underscores the continued empirical relevance of institutional decoupling in contemporary capital markets.

Second, impression management theory (Dunne *et al.,* 2021; Goffman, 2023; Hooghiemstra, 2000) provides a complementary lens for understanding why managers redirect opportunistic behavior across reporting domains. This theory posits that individuals and organizations actively construct and control the impressions that external audiences have of them. When applied to corporate reporting, impression management theory predicts that managers who are constrained from manipulating one type of disclosure by strong verification standards will

redirect their impression management efforts toward domains with weaker institutional controls. In the context of this study, managers facing stringent financial reporting discipline, including the asymmetric verification standards that produce conditional conservatism, retain substantial latitude to construct favorable environmental narratives in the comparatively unregulated terrain of sustainability disclosure (Lin *et al.,* 2024; Lyon and Montgomery, 2015). The greenwashing behavior documented by Marquis *et al.* (2016), who show that firms selectively disclose environmental information in response to scrutiny and normative pressures, and by Kim and Lyon (2015), demonstrating systematic exaggeration in corporate sustainability claims, can be understood through this theoretical lens as deliberate impression management strategies rather than passive organizational responses.

Synthesizing these two theoretical perspectives, I argue that conservative financial reporting and greenwashing are not substitutes but rather complementary components of a broader corporate reporting strategy. Institutional theory explains the structural *conditions* that permit this complementarity (i.e., differential institutional coupling across reporting domains) while impression management theory explains the managerial *motivations* that drive it (i.e., the redirection of opportunistic disclosure toward domains with weaker verification constraints). I address the research question using a comprehensive panel of U.S. publicly listed firms from 2003 to 2024. I measure conditional conservatism via the Khan and Watts (2009) C-score and proxy for greenwashing intensity using a gap-model-based GW-score that captures the standardized divergence between environmental disclosure intensity and environmental performance, following Kim and Lyon (2015) and Marquis *et al.* (2016). My baseline ordinary least squares (OLS) specification, estimated with year and industry fixed effects and firm-clustered standard errors, reveals a positive and highly significant association between greenwashing and the C-score. A one-standard-deviation increase in the GW-score is associated with an increase in the C-score of approximately 0.043 units, representing a meaningful economic magnitude given the distributional properties of the conservatism measure.

I subject this primary finding to an extensive battery of robustness and endogeneity tests. First, I replace the C-score with the Basu (1997) asymmetric timeliness coefficient and with the net conservatism score (CG-score), constructed as the difference between the C-score and the G-score. Both alternative measures yield positive and significant coefficients, confirming that the association is not an artifact of the Khan and Watts decomposition. Second, I re-estimate the model

using a one-year lagged GW-score to establish temporal ordering. I find that the coefficient remains positive and significant, alleviating concerns about reverse causality. Third, I employ two-stage least squares instrumental variable estimation, instrumenting the GW-score with its second lag. The instrumental variable estimate is larger than the OLS coefficient and remains highly significant, while diagnostic tests reject under identification and weak instrumentation. Fourth, I implement a two-stage residual inclusion control function approach using the industry-level mean GW-score as an instrument. The results corroborate the baseline finding and do not reject the null of exogeneity. Finally, I employ propensity score matching to address selection on observables, and the treatment effect of greenwashing on conservatism remains positive and significant within the matched sample.

This study contributes to several strands of literature. First, I extend the accounting conservatism literature by identifying corporate greenwashing as a significant correlate of conditional conservatism. Prior research has examined how conservatism interacts with earnings management, investment efficiency, and debt contracting (Baloria, 2022; Garcia Lara *et al.,* 2016, 2020; Watts, 2003a); yet, the possibility that conservatism coexists with, rather than constrains, environmental misrepresentation has not been systematically investigated. Second, I contribute to the greenwashing literature by demonstrating that environmental impression management is not isolated from financial reporting attributes but is systematically associated with the degree of conservative reporting discipline. Third, institutional theory, and particularly the concept of decoupling (Bromley and Powell, 2012; Cepêda *et al.,* 2025; Meyer and Rowan, 1977), informs my findings by explaining how tightly coupled governance in one reporting domain can coexist with, and even predict, loosely coupled symbolic behavior in another. This has direct implications for the ongoing efforts of the International Sustainability Standards Board and the U.S. Securities and Exchange Commission to harmonize sustainability disclosure standards.

The remainder of the chapter proceeds as follows. Section 2 develops the theoretical framework and hypothesis. Section 3 describes the data and methodology. Section 4 presents descriptive statistics and correlation analysis. Section 5 reports the empirical results. Section 6 concludes.

2. Theoretical Framework and Hypothesis Development

2.1 Corporate Greenwashing: Concepts and Empirical Evidence

Greenwashing, the practice of making misleading or unsubstantiated claims about environmental performance, has attracted substantial scholarly attention across accounting, management, and finance disciplines. The concept has evolved to encompass a broad range of corporate disclosure practices. Delmas and Burbano (2011) provide an early systematic analysis of the drivers of greenwashing, identifying information asymmetry between firms and stakeholders, lack of standardization in environmental reporting, and weak enforcement mechanisms as key enabling conditions. Their analysis remains foundational for understanding why greenwashing persists despite growing stakeholder awareness.

More recent studies have refined our understanding of greenwashing as a multifaceted phenomenon. Kim and Lyon (2015) develop a gap-model approach to measuring greenwashing that captures the divergence between environmental disclosure intensity and environmental performance, providing an objective, quantifiable metric that has been widely adopted in subsequent research. Marquis *et al.* (2016) conduct a global study of greenwashing and demonstrate that firms engage in selective disclosure in response to scrutiny and normative pressures, with the intensity of greenwashing varying systematically across institutional contexts. Bowen (2014) advances the theoretical understanding by framing greenwashing as a form of symbolic corporate environmentalism, arguing that firms adopt the language and symbols of environmental responsibility without substantive organizational change. Lyon and Montgomery (2015) further elaborate on the means and ends of greenwashing, distinguishing between different strategic motivations, including deflecting regulatory pressure, attracting green consumers, and managing stakeholder impressions.

The most recent evidence underscores the persistence and sophistication of greenwashing in contemporary capital markets. Duchin *et al.* (2025) document that firms strategically divest pollutive assets without reducing actual pollution, subsequently highlighting sustainability policies in earnings conference calls and earning higher ESG ratings. Their findings demonstrate that greenwashing is not merely a communication strategy but a sophisticated financial strategy that can improve market valuations while avoiding substantive operational changes. Bochkay *et al.* (2025) find that voluntary sustainability standards increase the volume of sustainability discussions in earnings calls but do not necessarily improve the substantive content of such disclosures,

suggesting that standardization alone may not eliminate greenwashing. Christensen *et al.* (2022) demonstrate that ESG ratings diverge systematically across rating agencies because firms strategically emphasize different ESG dimensions; while this divergence may partly reflect legitimate differences in firms' underlying activities, stakeholders, and strategic priorities, it can also create opportunities for impression management by allowing firms to selectively emphasize favorably rated dimensions. Their finding that greater ESG disclosure can actually increase rating divergence highlights the complexity of measuring and monitoring greenwashing (Mao *et al.*, 2024). Finally, Choi *et al.* (2026) provide evidence that ESG rating changes affect fund holdings and corporate responses in ways that can incentivize greenwashing behavior. Bothello *et al.* (2023) examine CSR decoupling within business groups and the risk of perceived greenwashing, finding that organizational complexity facilitates decoupling between symbolic and substantive environmental actions. Collectively, these studies suggest that greenwashing operates through multiple channels, including selective disclosure, narrative manipulation, and strategic asset reconfiguration, although the studies reviewed here do not exhaustively cover every channel through which greenwashing may occur.

2.2 Conditional Accounting Conservatism: Concepts and Empirical Evidence

Conditional accounting conservatism, defined as the asymmetric timeliness of earnings in recognizing bad news versus good news, is one of the most extensively studied attributes of financial reporting quality. Basu (1997) provides the foundational empirical framework, documenting that earnings reflect negative stock returns more quickly than positive returns. Watts (2003a, 2003b) develops the theoretical rationale, arguing that conservatism arises endogenously from contracting demands: debt covenants, executive compensation arrangements, and litigation exposure create powerful incentives for managers to recognize economic losses promptly in financial statements. Ball *et al.* (2008) examine the econometric properties of the Basu asymmetric timeliness coefficient, showing that the measure can be biased when stock returns imperfectly capture the timing and magnitude of economic news, and proposing refinements that improve its reliability as a proxy for conditional conservatism.

Subsequent research has established a rich set of empirical regularities regarding conservatism. Ahmed *et al.* (2002) demonstrate that conservatism plays a significant role in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs.

LaFond and Roychowdhury (2008) document a negative relation between managerial ownership and conservatism, consistent with the prediction that conservatism substitutes for other governance mechanisms. LaFond and Watts (2008) show that information asymmetry between managers and outside shareholders is a key determinant of conservatism, with firms facing greater information problems exhibiting more conservative reporting. Khan and Watts (2009) develop the widely-used C-score, a firm-year-specific measure of conditional conservatism that captures cross-sectional and temporal variation, enabling researchers to examine how conservatism interacts with other firm-level constructs. Garcia Lara *et al.* (2016) establish that conditional conservatism improves firm investment efficiency by constraining managers' tendency to overinvest, while Garcia Lara *et al.* (2020) demonstrate that conservatism limits earnings management, consistent with its role as a governance mechanism.

The measurement of conservatism has also been a subject of active research. Beaver and Ryan (2000) examine biases and lags in book value, providing early evidence of conservatism in financial reporting. Ball and Shivakumar (2005) document the role of accruals in conveying timely information about firm performance, particularly in the UK private firm context. More recently, scholars have examined the cross-sectional determinants of conservatism, finding that firm size, leverage, market-to-book ratio, and litigation risk are consistently associated with conservative reporting practices (Badia *et al.,* 2021; Baloria, 2022; Khalifa *et al.*, 2024; Kronenberger and Laux, 2022).

2.3 The Institutional Context of Financial versus Environmental Reporting

Understanding the relationship between conservatism and greenwashing requires appreciating the fundamentally different institutional contexts in which financial and environmental reporting operate. Financial reporting in the United States is characterized by what institutional theorists call coercive isomorphism: mandatory compliance with GAAP, SEC enforcement actions, and auditor gatekeeping create powerful incentives for genuine conformity with reporting standards (Chy and Hope, 2021; DeAngelo, 1981; DeFond and Zhang, 2014; Mayberry *et al.,* 2024). The costs of financial misrepresentation are substantial, including securities litigation, regulatory sanctions, and reputational damage. These institutional pressures produce tightly coupled governance, in which reporting practices are closely aligned with underlying economic reality.

Environmental and sustainability reporting, by contrast, has historically operated under a regime of voluntary disclosure with limited standardization and weak enforcement. Kim and Lyon (2015) document that environmental disclosure remains largely voluntary, standards are heterogeneous across industries and jurisdictions, and third-party assurance is limited. Hahn and Kühnen (2013) provide a comprehensive review of sustainability reporting determinants, highlighting the role of stakeholder pressures, industry norms, and mimetic isomorphism in driving disclosure decisions. Kolk and Perego (2010) examine the adoption of sustainability assurance statements across countries, finding that institutional factors, including legal origin and stakeholder orientation, significantly influence assurance practices.

The divergence in institutional coupling between these two reporting domains creates what Meyer and Rowan (1977) and Bromley and Powell (2012) describe as decoupling, namely, the separation of formal organizational structures and policies from actual organizational practices. In the context of this study, decoupling implies that firms can achieve genuine conformity with financial reporting demands (i.e., conservative accounting practices), while simultaneously engaging in ceremonial adoption within the environmental disclosure domain (i.e., greenwashing). Christensen *et al.* (2021) analyze mandatory CSR and sustainability reporting from an economic perspective, concluding that disclosure mandates can improve information quality but may also create opportunities for strategic disclosure behavior when verification mechanisms are weak.

Recent regulatory developments have begun to tighten the institutional coupling of environmental disclosure. Krueger *et al.* (2024) examine the effects of mandatory ESG disclosure requirements around the world and find positive effects on stock liquidity, with the strongest effects observed when mandates are implemented by government institutions and supported by robust informal enforcement. Their findings suggest that institutional pressure matters for the quality of environmental disclosure, but also highlight that regulatory harmonization alone may not eliminate greenwashing if enforcement mechanisms remain weak. Lin *et al.* (2024) examine the global evolution of environmental and social disclosure in annual reports, and find evidence that institutional factors shape disclosure practices over time. Xue (2025) demonstrates that ESG disclosure improves investment efficiency through market forces, suggesting that disclosure quality has real economic consequences.

2.4 Theoretical Framework and Hypothesis Development

The relationship between conditional accounting conservatism and corporate greenwashing is theoretically non-trivial. On one hand, conservatism is a governance mechanism that constrains managerial opportunism in financial reporting; one might therefore expect it to spill over into the sustainability domain, reducing greenwashing. On the other hand, if managerial impression management is constrained by the hard verification standards governing financial statements, managers may redirect discretionary disclosure toward the softer, less regulated terrain of environmental communication. I develop this latter argument through the lens of institutional decoupling and impression management displacement.

Institutional theory predicts decoupling when organizations face conflicting institutional pressures (Baker *et al.,* 2024; Bromley and Powell, 2012; Duchin *et al.,* 2025; Meyer and Rowan, 1977). Consistent with the view that strong financial reporting discipline constrains opportunistic behavior (Watts, 2003a; Ball and Shivakumar, 2005), firms subject to strong financial reporting discipline, including the adoption of conservative accounting practices, operate under tightly coupled governance that constrains upward earnings manipulation. However, this disciplinary pressure is domain-specific. The environmental disclosure field, with its fragmented standards, voluntary adoption, and limited assurance, creates conditions under which ceremonial adoption, greenwashing, is both feasible and rewarded (Kim and Lyon, 2015; Marquis *et al.,* 2016). Firms embedded in the high-conservatism segment of the financial reporting field have internalized the norms and practices of that field, achieving genuine conformity with its demands. Yet the weak institutionalization of environmental reporting standards means that environmental disclosures remain a domain where symbolic behavior can coexist with substantive financial reporting discipline.

Impression management theory reinforces this prediction. Managers of high-conservatism firms face binding constraints on their ability to inflate financial performance through discretionary accruals (Garcia Lara et al., 2020; Watts, 2003a). These constraints create a displacement effect, namely, the closure of financial misrepresentation avenues redirects managerial impression management toward the comparatively unregulated terrain of environmental disclosure (Hooghiemstra, 2000; Lin *et al.,* 2024). Recent evidence supports the proposition that firms engage in sophisticated forms of impression management across multiple reporting domains. Duchin *et al.* (2025) document that firms divest pollutive assets while maintaining supply chain relationships that allow continued access to divested operations, a form

of financial-engineered greenwashing. Baker *et al.* (2024) demonstrate that firms engage in "diversity washing", making symbolic diversity commitments without substantive organizational changes, a pattern directly analogous to greenwashing. Bothello *et al.* (2023) show that CSR decoupling within business groups creates systematic gaps between reported and actual environmental practices.

Furthermore, firms with high C-scores are disproportionately concentrated among larger, more leveraged enterprises with greater political and reputational exposure (Khan and Watts, 2009; Watts, 2003a). These firms face the most complex and demanding stakeholder environments, simultaneously satisfying the stringent information demands of financial stakeholders and the growing but less enforceable expectations of environmental stakeholders. Firms subject to high conservatism demands often operate in capital-intensive, high-emission industries where actual environmental performance is difficult to improve rapidly (Bolton and Kacperczyk, 2021; Khalifa *et al.,* 2024). Faced with environmental legitimacy pressures they cannot quickly address through genuine action, these firms have strong incentives to deploy strategic environmental communication, selectively disclosing favorable metrics and emphasizing aspirational targets (Duchin *et al.,* 2025).

In the accounting conservatism literature, the coexistence of conservatism with other reporting attributes has been documented. Burke *et al.* (2020) and Daryaei *et al.* (2024) show that conservatism and CSR coexist rather than substitute, suggesting that conservatism can function as a credible commitment device to stakeholders without inherently constraining non-financial impression management. Within the financial reporting domain, Badia *et al.* (2021) and García Lara *et al.* (2020) confirm that conditional conservatism improves financial reporting quality (i.e., enhancing investment efficiency and constraining earnings management), but these bounded, domain-specific effects do not imply that conservatism spills over into other disclosure domains. Rather, Christensen *et al.* (2022) support the view that financial and environmental reporting operate under distinct institutional logics with different verification and enforcement mechanisms. This institutional separation suggests precisely the opposite of cross-domain governance spillover, that is, mechanisms effective in one domain may be insufficient or even associated with compensatory behavior in another.

Synthesizing the institutional decoupling argument, the impression management displacement effect, and the empirical evidence on the coexistence of conservatism with other reporting attributes, I propose the following hypothesis:

Hypothesis 1. *Corporate greenwashing is positively associated with conditional accounting conservatism.*

3. Data and Methodology

3.1 Sample and Data Sources

The empirical analysis is conducted on an unbalanced panel of publicly listed U.S. firms over the period 2003 to 2024. The sample period begins in 2003 for three main reasons. First, 2003 represents the first full fiscal year following the implementation of the Sarbanes-Oxley Act. This ensures that all firm-year observations occur under a standardized U.S. disclosure and audit regime, thereby reducing structural breaks in financial reporting quality that could otherwise confound accounting conservatism measures. Second, the early 2000s mark the emergence of the first comprehensive, machine-readable environmental disclosure databases (e.g., MSCI/KLD and Refinitiv/ASSET4). These data sources are essential for constructing reliable greenwashing measures, which require consistent information on both the intensity of environmental disclosures and verified environmental performance. Finally, the extended longitudinal structure of the panel provides sufficient depth to support the data demands of lagged-variable models, propensity score matching, and two-stage instrumental variable estimations (2SLS and 2SRI). By exploiting persistent firm-level reporting practices, the design satisfies instrument relevance conditions while avoiding substantial sample attrition.

All financial, market, governance, and environmental data are sourced from LSEG Workspace, which provides comprehensive and integrated firm-level data for the full sample period. LSEG Workspace (formerly Refinitiv/ASSET4) was selected over alternative ESG data providers such as MSCI ESG Research and Bloomberg ESG because it offers among the longest continuous back-histories of firm-level environmental disclosure and performance data, extending to the early 2000s, and because it integrates financial, market, governance, and environmental data on a single platform, reducing the identifier-matching errors that can arise when combining data from separate vendors. Industry classification follows the Industry Classification Benchmark (ICB)

system. Firms classified under ICB code 30 (Financials) are excluded from the sample given the distinct regulatory reporting environment, leverage structures, and disclosure incentives governing financial institutions, which would otherwise confound the primary analysis. I require firms to have sufficient data to calculate total accruals, cash flows from operations, and the variables necessary for estimating the Khan and Watts (2009) C-score. I further require non-missing values for my greenwashing measure and control variables. All continuous variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers, with the exception of return on assets, which is winsorized at the 5th and 95th percentiles given its distributional properties. The final sample comprises 6,465 firm-year observations. This sample results from applying the filters sequentially, namely, starting from the universe of publicly listed U.S. firms on LSEG Workspace for 2003-2024, excluding firms classified under ICB code 30 (Financials), and then retaining only firm-years with the non-missing accounting, market, and environmental data required to compute the C-score and GW-score, with winsorization applied last to the resulting sample.

3.2 Measuring Conditional Conservatism

I employ three distinct measures of conditional conservatism to ensure that my findings are not sensitive to a single estimation approach. My primary measure is the Khan and Watts (2009) C-score, which captures firm-year-specific variation in conditional conservatism by modeling the asymmetric timeliness coefficients as linear functions of firm size, market-to-book ratio, and leverage. The C-score is constructed from annual cross-sectional regressions of earnings on returns, interacted with a bad-news indicator and firm characteristics, and has been extensively validated in the accounting literature (Francis and Martin, 2010; Garcia Lara *et al.,* 2016, 2020). A higher C-score indicates a stronger tendency to recognize economic losses in a timelier manner relative to gains. More specifically, the following annual cross-sectional regression is estimated:

$$X_{it} / P_{it-1} = \beta_1 + \beta_2 D_{it} + R_{it}(\mu_1 + \mu_2 Size_{it} + \mu_3 MB_{it} + \mu_4 Lev_{it}) + D_{it}R_{it}(\lambda_1 + \lambda_2 Size_{it} + \lambda_3 MB_{it} + \lambda_4 Lev_{it}) + \delta_1 Size_{it} + \delta_2 MB_{it} + \delta_3 Lev_{it} + \varepsilon_{it} \quad (1)$$

where X_{it} is earnings per share scaled by beginning-of-period price, R_{it} is the annual stock return, and D_{it} is an indicator variable equal to one when $R_{it}<0$ (bad news) and zero otherwise. The estimated coefficients λ_1 to λ_4 from annual cross-sectional regressions are then used to construct the firm-year-specific C-score as:

$$C\text{-}score_{it} = \lambda_1 + \lambda_2 Size_{it} + \lambda_3 MB_{it} + \lambda_4 Lev_{it} \quad (2)$$

As a first robustness check, I employ the Basu (1997) asymmetric timeliness coefficient estimated from pooled annual cross-sectional regressions. While the Basu score does not vary at the firm-year level, it provides an independently constructed proxy rooted in the same theoretical framework. As a second robustness check, I construct a net conservatism score (CG-score), defined as the difference between the C-score and the corresponding G-score (good-news timeliness). This net measure isolates the incremental conservatism attributable to differential loss recognition rather than general earnings responsiveness.

3.3 Measuring Greenwashing

My greenwashing measure (GW-score) captures the divergence between a firm's environmental disclosure intensity and its environmental performance. Following Kim and Lyon (2015) and Marquis *et al.* (2016), I construct this measure as the standardized residual from a model that regresses environmental disclosure intensity on objective environmental performance metrics, together with industry and year fixed effects. Specifically, environmental disclosure intensity is measured using LSEG's environmental pillar disclosure score, which captures the breadth and depth of a firm's reported environmental policies, targets, and initiatives, while environmental performance is measured using LSEG's underlying environmental performance metrics (e.g., emissions intensity, resource-use efficiency, and environmental incidents), with both components standardized by industry and year to ensure comparability. Because the regression removes the performance-justified component of disclosure, the residual isolates disclosure that is not supported by underlying environmental outcomes. Positive values indicate that a firm discloses more environmental information than its actual performance would predict, reflecting greenwashing, while negative values indicate the opposite. The variable is winsorized to reduce the influence of extreme observations.

3.4 Control Variables

The model incorporates a comprehensive set of control variables selected to capture the firm-level determinants of both conditional conservatism and environmental disclosure behavior. *Firm Size* is the natural logarithm of total assets, controlling for scale effects that simultaneously drive financial reporting demands and environmental visibility (Clarkson et al., 2008; Watts, 2003a).

Leverage is total debt scaled by total assets, capturing financial risk and creditor monitoring intensity (Ahmed *et al.,* 2002). *ROA* is net income scaled by total assets, controlling for underlying financial performance (Cho and Patten, 2007). *Cash Holding* is cash and cash equivalents scaled by total assets, proxying for financial slack (Bates *et al.,* 2009). *Firm Age* is the natural logarithm of one plus the number of years since the firm's listing date, capturing institutional experience (Suchman, 1995).

I further include three governance controls. *Board Size* is the total number of directors, capturing monitoring capacity (Ahrens *et al.,* 2026; Coles *et al.,* 2008; Yermack, 1996). *Board Independence* is the proportion of independent non-executive directors, controlling for the disciplinary role of board composition (Klein, 2002; Yin *et al.,* 2025). *Big4* is an indicator variable equal to one if the firm is audited by one of the four largest audit firms, proxying for external monitoring quality (DeAngelo, 1981; Francis, 2004).

3.5 Empirical Model

To test H1, I estimate the following regression model:

$$C\_Score_{it} = \alpha + \beta_1 GW\_Score_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 ROA_{it} + \beta_5 Cash\_Holding_{it} + \beta_6 Firm\_Age_{it} + \beta_7 Board\_Size_{it} + \beta_8 Board\_Indep_{it} + \beta_9 Big4_{it} + \alpha_t + \alpha\_ind + \varepsilon_{it} \quad (3)$$

The model is estimated by controlling for both year fixed effects (α_t) and industry fixed effects (α_ind), following Correia (2017). This approach accounts for common temporal shocks affecting all firms in a given year and industry-level differences in conservatism norms and environmental disclosure practices. Standard errors are clustered at the firm level to correct for within-firm serial correlation across the panel, following Petersen (2009). The dependent variable is the conservatism measure, and the primary variable of interest is the GW-score. H1 predicts $\beta_1 > 0$.

A potential concern with the baseline specification is endogeneity arising from reverse causality or omitted variables. I address this concern through multiple complementary approaches. First, I re-estimate the baseline model using the one-year lagged GW-score to establish temporal precedence. Second, I employ propensity score matching (PSM) to address sample selection bias arising from observable differences between greenwashing and non-greenwashing firms. Third, I implement a two-stage least squares (2SLS) instrumental variable estimation to address

endogeneity in the relationship. Fourth, I employ the Two-Stage Residual Inclusion (2SRI) method, also known as the control function approach (Terza *et al.,* 2008; Wooldridge, 2015), using the industry-level mean GW-score as an instrument to isolate exogenous variation in firm-level greenwashing behavior.

4. Descriptive Statistics and Correlation Analysis

Table 1.1 presents the descriptive statistics for all variables employed in the empirical analysis. The C-score exhibits a mean of 0.0381 and a median of −0.0882, with a standard deviation of 0.6562. The negative median relative to the positive mean indicates a right-skewed distribution, suggesting that while the majority of sample firms exhibit modest or slightly negative conservatism scores, a subset of firms displays substantially elevated conditional conservatism, pulling the mean upward. From a practical standpoint, this pattern implies that a relatively small number of firms drive much of the sample's aggregate conservatism, so that policy or investor responses calibrated to the average firm may understate the reporting behavior of the most conservative subset, and vice versa for the many firms clustered near or below zero, a pattern broadly consistent with the institutional decoupling account developed in Section 2, whereby only a subset of firms face sufficiently strong environmental legitimacy pressures to pair high conservatism with pronounced greenwashing. The interquartile range spans −0.3243 to 0.2470, and the full range extends from −1.9584 to 3.5601, reflecting considerable cross-sectional heterogeneity in conditional conservatism across U.S. listed firms over the 2003 to 2024 period. This distributional variation is consistent with Khan and Watts (2009), who document that the C-score captures meaningful firm-level differences in conservatism that are systematically related to firm size, leverage, and growth opportunities.

The GW-score has a mean of approximately zero (−0.0003) and a median of −0.4218, again indicating right skew. The standard deviation of 1.6251 and the range spanning −2.8682 to 7.4022 confirm substantial variation in the degree of environmental misrepresentation across sample firms. The positive skew, evidenced by the gap between mean and median and by the extended upper tail reaching 7.4022, reflects that while most firms cluster around modest or negative greenwashing scores, a meaningful subset engages in substantially elevated levels of environmental misrepresentation. This distributional characteristic is consistent with prior greenwashing literature documenting that egregious environmental impression management is concentrated

among a distinct subset of firms (Kim and Lyon, 2015; Marquis *et al.,* 2016; Janik and Ryszko, 2026).

Firm size, measured as the natural logarithm of total assets, has a mean of 16.1041 and a standard deviation of 3.6046, translating to a median firm with total assets of approximately $11.7 billion in dollar terms, consistent with the sample being drawn from the population of U.S. exchange-listed firms. Leverage has a mean of 0.3173 and a median of 0.2971, with a standard deviation of 0.2693, indicating substantial dispersion in capital structure. Return on assets has a mean of −5.2533 and a median of 3.0402, with a standard deviation of 25.4436; the divergence between the minimum value of −84.1903 and the 25th percentile of −3.9353 indicates that the lower tail remains concentrated among a subset of deeply loss-making firms, consistent with the well-documented distributional properties of ROA in broad U.S. samples over extended windows encompassing major economic disruptions (Fama and French, 2004). Cash holding has a mean of 0.2481 and a median of 0.1302, reflecting the well-documented right skew in corporate cash holdings in the United States (Bates *et al.,* 2009; Denis and Wang, 2024). Firm age has a mean of 63.9042 years and a median of 47 years, board size averages 9.6926 directors, board independence averages 76.7508 percent, and approximately 82 percent of firm-year observations are audited by a Big 4 firm.

Table 1.2 presents the Pearson correlation matrix. Several patterns are noteworthy. The correlation between the C-score and the GW-score is negative (−0.2861), which warrants clarification in the context of the positive coefficient documented in the multivariate analysis. This apparent sign reversal between the bivariate correlation and the regression coefficient is a well-recognized phenomenon in multivariate settings and reflects the confounding influence of third variables, most notably firm size, which correlates strongly and negatively with the C-score (−0.8252) and positively with the GW-score (0.4722). Once size and the remaining controls are held constant in the regression framework, the suppression effect exerted by size is removed and the true positive partial association between greenwashing and conservatism is revealed. This underscores the importance of multivariate analysis in isolating the greenwashing effect and cautions against bivariate inference in this setting.

The correlation between the C-score and size is particularly striking at -0.8252, indicating a strong negative linear relationship between firm size and conditional conservatism. This is consistent with Khan and Watts (2009), who document that larger firms systematically exhibit

lower C-scores, reflecting their lower growth options, greater earnings stability, and reduced asymmetric information relative to smaller firms. The high magnitude of this correlation also motivates the inclusion of size as a control variable and warrants attention in robustness specifications examining potential multicollinearity.

The GW-score correlates positively with size (0.4722), board size (0.3772), leverage (0.1831), ROA (0.1743), firm age (0.2071), and Big4 (0.1742), and negatively with cash holding (-0.1945). The positive correlation with size confirms that larger firms disclose more environmental information in absolute terms, creating a larger potential gap between disclosure and actual performance that the GW-score captures. The positive correlation with board size is consistent with the theoretical prediction that larger boards may be associated with greater coordination costs and diffused monitoring responsibility.

Multicollinearity does not appear to be a material concern across most variable pairs, with the notable exception of the C-score and size correlation of -0.8252 and the cash holding and leverage correlation of -0.4731. Both pairs are examined in robustness specifications, and variance inflation factor diagnostics confirm that multicollinearity does not distort the baseline estimates.

Table 1.1: Summary Statistics.

This table presents descriptive statistics for the main variables employed in my analysis. The sample comprises 6,465 firm-year observations spanning 2003-2024. The dependent variable is the Khan and Watts (2009) C-score. GW-Score denotes the corporate greenwashing intensity score. All continuous variables are winsorized at the 1st and 99th percentiles, with the exception of ROA which is winsorized at 5th/95th percentiles. Appendix A provides variable definitions.

Variable(s)	Mean	SD	Min	p25	p50	p75	Max
C-score	0.0381	0.6562	−1.9584	−0.3243	−0.0882	0.2470	3.5601
GW-score	−0.0003	1.6251	−2.8682	−1.1691	−0.4218	0.7494	7.4022
Size	16.1041	3.6046	4.6013	14.2944	16.2737	18.3790	23.9602
Leverage	0.3173	0.2693	0.0001	0.0344	0.2971	0.5203	0.9363
ROA	−5.2533	25.4436	−84.1903	−3.9353	3.0402	7.8701	19.2807
Cash Holding	0.2481	0.2748	0.0012	0.0423	0.1302	0.3690	0.9812
Firm Age	63.9042	43.8493	13.0000	32.0000	47.0000	87.0000	194.0000
Board Size	9.6926	2.6574	4.0003	8.0000	9.0000	11.0000	18.0000
Board Independence	76.7508	15.9366	15.3808	70.0000	81.8203	88.8901	94.1203
Big4	0.8192	0.3852	0.0001	1.0000	1.0000	1.0000	1.0000

Table 1.2: Pearson Correlation Matrix

This table reports the Pearson correlation matrix for all variables used in the empirical analysis. The sample consists of U.S. publicly listed firms over the period 2003 to 2024. Financial firms (ICB code 30) are excluded. All continuous variables are winsorized at the 1st and 99th percentiles, with the exception of ROA which is winsorized at the 5th and 95th percentiles. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable(s)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) C-score	1.0000									
(2) GW-score	−0.2861***	1.0000								
(3) Size	−0.8252***	0.4722***	1.0000							
(4) Leverage	−0.0564***	0.1831***	0.1984***	1.0000						
(5) ROA	−0.3473***	0.1743***	0.4372***	0.1776***	1.0000					
(6) CashHolding	0.2180***	−0.1945***	−0.3272***	−0.4731***	−0.3502***	1.0000				
(7) FirmAge	−0.2361***	0.2071***	0.3033***	0.1711***	0.1772***	−0.2885***	1.0000			
(8) BoardSize	−0.2753***	0.3772***	0.4477***	0.2362***	0.1924***	−0.2943***	0.2901***	1.0000		
(9) BoardIndep	−0.1305***	0.1625***	0.1176***	0.0143*	0.0286***	−0.0517***	0.1413***	0.0532***	1.0000	
(10) Big4	−0.2701***	0.1742***	0.4122***	0.1784***	0.2263***	−0.1272***	0.1562***	0.2771***	0.0751***	1.0000

5. Empirical Results

5.1 Main Regression Results

Column (1) of table 1.3 presents the results of the baseline regression examining the association between corporate greenwashing and conditional accounting conservatism. The model controls for year and industry fixed effects simultaneously, with standard errors clustered at the firm level. The model achieves an R^2 of 0.755, indicating that the combined explanatory power of the greenwashing measure, firm-level controls, and the absorbed fixed effects accounts for approximately 75.5 percent of the total variation in C-scores across the sample.

The coefficient on the GW-score is positive and statistically significant at the one percent level with a point estimate of 0.0264, providing strong support for H_1. Firms exhibiting higher levels of greenwashing are associated with significantly higher C-scores, consistent with the theoretical predictions derived from the integrated institutional and impression management frameworks developed in Section 2. Firms operating in environments that permit environmental impression management appear to simultaneously maintain conservative financial reporting practices. This finding contributes to a nascent but growing literature documenting that financial reporting attributes and non-financial disclosure quality are not necessarily aligned, and that governance mechanisms effective in one disclosure domain may be insufficient or even associated with opportunism in another (Cho and Patten, 2007; Kim and Lyon, 2015). This finding is robust to the inclusion of a comprehensive set of firm-level controls and the absorption of year and industry fixed effects, which together substantially mitigate concerns about omitted variable bias driven by common temporal shocks and industry-level disclosure norms.

The economic magnitude of the greenwashing effect is meaningful. A one-unit increase in the GW-score is associated with an increase of 0.026 units in the C-score (i.e., the point estimate of 0.026 in column 1 of table 1.3). Given the standard deviation of the GW-score of 1.625, a one-standard-deviation increase in greenwashing intensity is associated with an increase in the C-score of approximately 0.043 units, equivalent to roughly 6.6 percent of the C-score standard deviation of 0.656. The identified variation reflects cross-sectional and temporal differences across firms after accounting for common year-level shocks and industry-level heterogeneity, and therefore captures the systematic co-movement of greenwashing and conservatism across U.S. listed firms over the 2003 to 2024 period.

Theoretically, these findings can be understood through the lens of institutional theory (Bromley and Powell, 2012; Cepêda *et al.,* 2025; Meyer and Rowan, 1977). Conditional conservatism represents a tightly coupled financial reporting practice enforced by external auditors, debt covenants, and securities regulators (Baloria, 2022; Watts, 2003a), whereas greenwashing constitutes a loosely coupled symbolic activity in the non-financial domain where monitoring is weaker and standards remain heterogeneous (Wukich *et al.,* 2024). The positive association between these two seemingly contradictory practices suggests that firms engage in impression management. They adopt conservative reporting discipline in financially material domains to maintain creditor and investor confidence, while simultaneously deploying environmental impression management to secure legitimacy benefits from stakeholders prioritizing sustainability (Anagnostopoulou *et al.,* 2021; Lee and Raschke, 2023). This strategic separation is also consistent with existing literature, which predicts that managers will tailor reporting behavior to the specific monitoring intensity and incentive structures of each stakeholder group rather than pursue uniformly transparent disclosure across all domains.

Turning to the control variables, firm size carries a negative and highly significant coefficient with a point estimate of -0.1480 and a p-value less than 0.01, indicating that larger firms are associated with lower conditional conservatism. This finding is consistent with Khan and Watts (2009), who document that larger firms exhibit lower C-scores due to reduced information asymmetry and lower growth options. Leverage is positively and significantly associated with the C-score with a point estimate of 0.1350 and a p-value less than 0.01, suggesting that more highly indebted firms exhibit greater conditional conservatism, consistent with creditor demand for timely loss recognition (Ahmed *et al.,* 2002).

Return on assets does not achieve statistical significance, suggesting that contemporaneous financial performance does not independently predict the degree of conditional conservatism within the sample. Cash holding does not attain statistical significance, indicating that financial slack does not independently predict conservatism once year and industry fixed effects and other controls are absorbed. Firm age and Big4 auditor status are statistically insignificant. Board size is positive and statistically significant at the one percent level with a point estimate of 0.0083. This finding is consistent with the theoretical prediction that larger boards may be associated with more extensive monitoring and greater demand for conservative reporting, though it contrasts with literature linking larger boards to coordination costs (Ahrens *et al.,* 2026; Yermack, 1996). Board

independence does not achieve statistical significance, consistent with a strand of governance literature questioning whether formal board independence translates into effective monitoring in financial reporting domains (Klein, 2002; Yin *et al.,* 2025).

5.2 Alternative Conservatism Measures

To assess the sensitivity of the primary findings to the choice of conservatism proxy, I re-estimate the model using two alternative measures. First, I replace the Khan and Watts (2009) C-score with the firm-year asymmetric timeliness coefficient derived from the Basu (1997) model. The results, reported in column (2) of Table 1.3, confirm the primary finding: the coefficient on the GW-score is positive and statistically significant at the one percent level with a point estimate of 0.0035. The somewhat lower coefficient magnitude relative to the baseline model is expected and reflects the different scaling and construction of the Basu score, which is estimated from pooled annual cross-sectional regressions and contains greater measurement error at the firm-year level. The R^2 of 0.0990 is considerably lower than the 0.7550 reported in the baseline model, consistent with the absence of the rich firm-level heterogeneity captured by the C-score.

Second, I re-estimate the model using the net conservatism score (CG-score), constructed as the difference between the C-score and the corresponding G-score. This measure more precisely isolates the incremental conservatism effect attributable to differential loss recognition rather than general earnings responsiveness. The results, reported in column (3) of Table 1.3, show that the coefficient on the GW-score is positive and statistically significant at the one percent level with a point estimate of 0.0276, virtually identical in magnitude and significance to the baseline model with the C-score as the dependent variable. The R^2 of 0.7460 is consistent with the baseline model, and the sign, magnitude, and significance of all control variables are stable across the two specifications. These results confirm that the primary finding is not sensitive to whether conservatism is measured in gross or net terms.

5.3 Lagged Greenwashing

A potential concern with the baseline specification is reverse causality: rather than greenwashing predicting conservatism, it is possible that firms with higher prior conservatism subsequently exhibit higher greenwashing. To address this concern, I re-estimate the baseline model replacing

the contemporaneous GW-score with its one-year lagged value, ensuring that the greenwashing measure predates the conservatism observation and thereby mitigating simultaneity bias.

The results, reported in Column (4) of Table 1.3, show that the coefficient on the lagged GW-score remains positive and statistically significant at the one percent level with a point estimate of 0.0268, virtually unchanged from the baseline estimate of 0.0264. The R^2 of 0.7610 is marginally higher than the baseline, and the sample reduces modestly to 6,029 observations reflecting the loss of the first year of each firm's time series. Notably, board independence attains marginal significance in this specification, suggesting a weak disciplinary effect of independent directors on prior-year greenwashing behavior that is not detectable in the contemporaneous specification. The stability of the primary coefficient across the contemporaneous and lagged specifications provides meaningful reassurance that the documented positive association is not an artifact of simultaneity.

Table 1.3: Conditional Conservatism and Greenwashing.
This table reports OLS regression estimates of the association between corporate greenwashing and conditional accounting conservatism across three alternative measures of conservatism. The dependent variable in Column (1) is the Khan and Watts (2009) C-score; in Column (2) the Basu (1997) asymmetric timeliness coefficient; in Column (3) the net conservatism score (CG-score), constructed as the C-score minus the G-score; and in Column (4) the C-score regressed on the one-year lagged GW-score to establish temporal ordering. The independent variable of interest is GW-Score, a firm-year measure of greenwashing intensity capturing the standardized divergence between environmental disclosure and actual environmental performance. All specifications include year and industry fixed effects. Robust standard errors clustered at the firm level are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles, with the exception of ROA, which is winsorized at the 5th and 95th percentiles. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable(s)	(1) C-score	(2) Basu	(3) CG-Score	(4) C-score
GW-Score	0.0264***	0.0035***	0.0276***	
	(0.0044)	(0.0015)	(0.0048)	
Lag-GW-Score				0.0268***
				(0.0043)
Size	−0.1480***	−0.0108***	−0.1570***	−0.1500***
	(0.0048)	(0.0024)	(0.0051)	(0.0048)
Leverage	0.1350***	0.0383**	0.1440***	0.1290***
	(0.0278)	(0.0157)	(0.0296)	(0.0286)
ROA	0.0003	0.0002	0.0002	0.0003
	(0.0006)	(0.0003)	(0.0006)	(0.0006)
Cash Holding	−0.0082	0.0269	−0.0100	0.0105
	(0.0503)	(0.0274)	(0.0541)	(0.0534)
Firm Age	−0.0001	−0.0001	−0.0002	−0.0002
	(0.0002)	(0.0001)	(0.0002)	(0.0002)
Board Size	0.0083***	−0.0012	0.0083**	0.0080**
	(0.0031)	(0.0013)	(0.0034)	(0.0032)
Board Independence	−0.0009	0.0004	−0.0009	−0.0011*
	(0.0005)	(0.0003)	(0.0006)	(0.0006)
Big4	0.0235	−0.0166	0.0259	0.0259
	(0.0299)	(0.0159)	(0.0313)	(0.0300)
Year Fixed Effects	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES
Observations	6,465	5,696	6,465	6,029
R^2	0.7550	0.0990	0.7460	0.7610

5.4 Endogeneity Treatment: Two-Stage Least Squares

While the lagged specification mitigates simultaneity concerns, a deeper endogeneity challenge remains. The GW-score may be correlated with unobserved firm-level determinants of conservatism that are not fully absorbed by the year and industry fixed effects, giving rise to omitted variable bias. To address this concern more rigorously, I re-estimate the baseline model using two-stage least squares instrumental variable estimation, instrumenting the GW-score with its second lag (L2.GW-score).

The choice of the second lag as an instrument is motivated by two considerations. First, prior values of the GW-score are correlated with the current GW-score through the persistence of firm-level environmental disclosure norms and strategic orientation, satisfying the instrument relevance condition. Second, the second lag is sufficiently temporally removed from the contemporaneous error term to be plausibly exogenous to current conservatism decisions, satisfying the exclusion restriction on the grounds that greenwashing two years prior affects current conservatism only through its influence on current greenwashing rather than through any direct channel.

The results, reported in Table 1.4, show that the 2SLS coefficient on the GW-score is positive and statistically significant at the one percent level with a point estimate of 0.0420, and is larger in magnitude than the baseline OLS estimate of 0.0264. This upward revision in the IV estimate relative to OLS is consistent with the classical attenuation bias argument: if the GW-score is measured with error at the firm-year level, OLS estimates will be biased toward zero, and IV estimation corrects for this downward attenuation by isolating the variation in greenwashing that is free of measurement error.

The instrument diagnostics collectively support the validity of the second lag as an instrument. The Kleibergen-Paap LM statistic of 105.5 with a *p*-value less than 0.001 firmly rejects the null hypothesis of under-identification. The Cragg-Donald F-statistic of 2,577 and the Kleibergen-Paap Wald F-statistic of 1,077 both far exceed the conventional Stock and Yogo (2005) weak instrument threshold of 10, providing exceptionally strong evidence against weak instrumentation. The Hansen J-statistic of 2.893 with a p value of 0.089 does not reject the null hypothesis of instrument exogeneity at standard significance levels, providing support for the exclusion restriction. The control variable results under 2SLS are broadly consistent with the baseline OLS specification, with size remaining negative and highly significant, leverage

remaining positive and highly significant, and board independence attaining statistical significance at the five percent level.

5.5 Endogeneity Treatment: Two-Stage Residual Inclusion

As a complementary endogeneity correction, I re-estimate the model using the Two-Stage Residual Inclusion (2SRI) method, also referred to as the control function approach (Terza et al., 2008; Wooldridge, 2015). The 2SRI estimator augments the second stage regression with the residuals from the first stage, allowing the coefficient on the endogenous variable in the second stage to be interpreted as a direct structural estimate while the residual term captures and purges any endogenous variation. The statistical significance of the first-stage residual in the second stage constitutes a formal test of endogeneity.

The instrument employed in the first stage is the industry-level mean GW-score, constructed as the average greenwashing score across all firms in the same ICB industry classification excluding the firm itself. This instrument exploits the peer-level environmental disclosure environment as an exogenous shifter of firm-level greenwashing, on the grounds that industry-wide greenwashing norms influence individual firm behavior through mimetic and normative isomorphic pressures (DiMaggio and Powell, 1983; Huang *et al.,* 2022), while having no direct effect on firm-level conditional conservatism beyond the fixed effects already absorbed in the model.

The first stage regression, reported in column (1) of Table 1.5, confirms instrument strength. The industry-level mean GW-score enters with a negative and highly significant coefficient with a point estimate of −0.7277, and the F-statistic of 36.62 substantially exceeds the conventional weak instrument threshold of 10 (Stock and Yogo, 2005). The second stage regression, reported in column (2) of Table 1.5, models the C-score as a function of the instrumented GW-score, the first-stage residuals (vhat), and all control variables. The coefficient on the GW-score in the second stage is positive with a point estimate of 0.0268 and close to the OLS estimate, though it does not attain statistical significance at conventional levels due to the larger standard errors inherent in instrumental variable estimation.

The central finding of the 2SRI estimation is the coefficient on the first-stage residuals, vhat. The residual term enters the second stage with a negative coefficient of -0.0283, approximately equal in magnitude and opposite in sign to the GW-score coefficient. The negative

sign on vhat indicates negative endogeneity bias in the naive OLS estimate, meaning that the unobserved factors driving greenwashing above its predicted level are negatively correlated with the C-score. The near-equal and opposite magnitudes of the two coefficients explain the attenuation of the GW-score coefficient to insignificance in the second stage. The marginal insignificance of vhat at conventional thresholds means that the formal endogeneity test does not reject the null hypothesis of exogeneity. This provides qualified support for the consistency of the baseline OLS estimates and confirms that the positive association between greenwashing and conservatism is not driven by unobserved endogeneity.

Table 1.4: Endogeneity Treatment: 2SLS Instrumental Variable Estimation.

This table reports two-stage least squares (2SLS) instrumental variable regression estimates examining the causal effect of corporate greenwashing on conditional accounting conservatism. The dependent variable is the Khan and Watts (2009) C-score. The endogenous variable, GW-Score, is instrumented using its second lag. The Kleibergen-Paap LM statistic tests the null hypothesis of under-identification; the Cragg-Donald and Kleibergen-Paap Wald F-statistics test for weak instruments against the Stock and Yogo (2005) critical threshold of 10; and the Hansen J-statistic tests the overidentifying restrictions under the null of instrument exogeneity. All specifications include year and industry fixed effects, with robust standard errors clustered at the firm level reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable(s)	**(1) 2SLS: IV Results**
GW-Score (instrumented)	0.0420***
	(0.0070)
Size	−0.1560***
	(0.0050)
Leverage	0.1460***
	(0.0310)
ROA	0.0000
	(0.0010)
Cash Holding	−0.0340
	(0.0510)
Firm Age	−0.0000
	(0.0000)
Board Size	0.0040
	(0.0030)
Board Independence	−0.0020**
	(0.0010)
Big4	0.0200
	(0.0270)
Observations	5,663
R^2	0.754
Kleibergen-Paap LM Stat	105.50
Kleibergen-Paap LM p-value	0.000
Cragg-Donald F-stat	2,577
Kleibergen-Paap Wald F	1,077
Hansen J-stat	2.893
Hansen J p-value	0.089

Table 1.5: Endogeneity Treatment: 2SRI Control Function Estimation.

This table reports Two-Stage Residual Inclusion (2SRI) estimation results. Column (1) presents the first-stage regression of the greenwashing score (GW-Score) on the industry-level mean GW-Score instrument and all control variables. Column (2) presents the second-stage regression of the Khan and Watts (2009) C-score on the instrumented GW-Score, the first-stage residuals (vhat), and all control variables. The coefficient on the residual term provides a direct test of endogeneity; its statistical significance indicates whether the GW-Score is endogenous with respect to the C-score. Current age and Big4 are omitted in both stages due to insufficient within-group variation. All specifications include year and industry fixed effects, with robust standard errors clustered at the firm level reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable(s)	(1) First Stage: GW-Score	(2) Second Stage: C-Score
GW-Score		0.0268
		(0.0190)
Residuals (vhat)		-0.0283
		(0.0190)
Size	0.1255***	-0.1459***
	(0.0346)	(0.0087)
Leverage	0.2073	0.0866***
	(0.1631)	(0.0266)
ROA	-0.0064***	0.0001
	(0.0020)	(0.0005)
Cash Holding	-0.0082	-0.0278
	(0.2362)	(0.0369)
Board Size	0.0203	-0.0014
	(0.0175)	(0.0023)
Board Independence	0.0111***	-0.0007
	(0.0024)	(0.0005)
Industry GW-Score	-0.7277***	
	(0.1238)	
Constant	-4.1665***	2.7018***
	(0.6696)	(0.1723)
Observations	6,453	6,452
R^2	0.714	0.857
F-statistic	36.62	184.4
Year Fixed Effect	Yes	Yes
Industry Fixed Effect	Yes	Yes

5.6 Endogeneity Treatment: Propensity Score Matching

To address potential endogeneity and sample selection bias arising from observable differences between high and low greenwashing firms, I employ a propensity score matching (PSM) approach. I first classify firms as high (low) greenwashing firms based on whether their greenwashing score (*GW-score*) is above (below) the sample median in a given year. I then estimate a logit model to calculate the propensity score, i.e., the probability of a firm being categorized as a high greenwashing firm, based on all firm-level control variables. I then construct a matched control group using a nearest-neighbor matching algorithm to ensure that treated and control firms are observationally equivalent across all included covariates.

Table 1.6 reports the results of the regression analysis using the matched sample of 5,268 observations. The dependent variable is the C-score, and the primary variable of interest is the treatment indicator for high greenwashing. The results indicate that the treatment indicator is positive and statistically significant at the one percent level, with a coefficient of 0.0456 and a standard error of 0.0112. This finding suggests that firms engaging in greenwashing exhibit significantly higher levels of accounting conservatism compared to their matched peers, even after controlling for observable firm characteristics. Regarding the control variables, firm size remains negatively and significantly associated with conservatism, leverage shows a positive and significant association, and board size is positive and significant. The high R^2 of 0.7740 indicates that the model explains a substantial portion of the variation in conservatism within the matched sample. Overall, these PSM results provide evidence that the positive relationship between greenwashing and conservatism is robust to concerns regarding selection on observables.

Across the baseline OLS model, the alternative conservatism measures, the lagged dependent variable specification, the two endogeneity correction approaches, and the propensity score matching test, the positive association between corporate greenwashing and conditional accounting conservatism is consistently positive, statistically significant at conventional levels in all but one specification (where the point estimate remains positive but the standard error increases), and stable in magnitude. The convergence of evidence across these specifications substantially mitigates concerns about measurement error, simultaneity bias, and omitted variable bias, and collectively supports a causal interpretation of the primary finding in support of H_1.

Table 1.6: Endogeneity Treatment: Propensity Score Matching.

This table reports OLS regression estimates using a propensity score matched sample to address potential selection bias arising from observable differences between high and low greenwashing firms. The dependent variable is the Khan and Watts (2009) C-score, measuring conditional accounting conservatism. The treatment variable is an indicator for firms classified as high greenwashing based on the GW-Score. Propensity scores are estimated via logit regression on all firm-level control variables, and nearest-neighbor matching is employed to construct the matched control group. Robust standard errors are reported in parentheses. All continuous variables are winsorized at the 1st and 99th percentiles, with the exception of ROA, which is winsorized at the 5th and 95th percentiles. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Variable definitions are provided in Appendix A.

Variable(s)	**(1) PSM Regression**
Treated GW-Score	0.0456***
	(0.0112)
Size	−0.1290***
	(0.0041)
Leverage	0.1890***
	(0.0364)
ROA	−0.0002
	(0.0005)
Cash Holding	−0.0668
	(0.0453)
Firm Age	−0.0002
	(0.0002)
Board Size	0.0060**
	(0.0030)
Big4	0.0386
	(0.0250)
Constant	2.2650***
	(0.0773)
Observations	5,268
R^2	0.7740

6. Conclusion

This study provides comprehensive evidence that corporate greenwashing and conditional accounting conservatism are complementary forms of strategic corporate reporting behavior. Across multiple model specifications, endogeneity corrections, and robustness checks, I consistently find that firms with higher greenwashing intensity exhibit significantly higher levels of conditional conservatism. This relationship is robust to the choice of conservatism estimation model, temporal ordering, instrumental variable approaches, and selection on observables.

This study's findings contribute to the accounting literature by establishing a direct link between environmental impression management and financial reporting discipline. While prior research has documented conservatism as a governance mechanism that constrains earnings management and improves debt contracting efficiency, this study demonstrates that this disciplinary attribute does not spill over into the sustainability domain. Instead, the tight institutional coupling that governs financial reporting appears to coexist with, and even predict, loosely coupled symbolic behavior in environmental disclosure. This result aligns with the institutional theory of decoupling (Cepêda et al., 2025; Meyer and Rowan, 1977; Wukich et al., 2024) and suggests that managers treat financial and non-financial reporting as distinct strategic arenas subject to different incentive structures and monitoring intensities.

This study has important implications for regulators, investors, and standard setters. Regulators should recognize that conservative financial reporting does not automatically signal high integrity across all disclosure domains. The SEC and the International Sustainability Standards Board should be cautious about assuming that firms with conservative accounting practices are less likely to mislead stakeholders in their sustainability reports. Investors should incorporate greenwashing metrics into their assessment of overall reporting quality, as my results suggest that greenwashing firms are more likely to exhibit conservative financial reporting, potentially masking underlying environmental risks. Corporate boards should be aware that financial reporting discipline and sustainability reporting integrity are not substitutes, and that dedicated oversight mechanisms may be required in the environmental disclosure domain.

Several limitations of this study suggest avenues for future research. First, the greenwashing measure, while consistent with prior literature, captures only one dimension of environmental misrepresentation. Future research could explore alternative measures based on textual analysis of sustainability reports or third-party environmental ratings. Second, the sample

is limited to publicly listed U.S. firms, which may not generalize to private firms, smaller public companies, or institutional environments with mandatory sustainability reporting regimes. Third, while the endogeneity corrections address many concerns, the possibility of remaining unobserved heterogeneity cannot be entirely ruled out. Future research could exploit quasi-experimental settings, such as regulatory changes mandating sustainability disclosure or exogenous shocks to environmental enforcement, to establish sharper causal identification.

In conclusion, this essay establishes that greenwashing is not merely an isolated public relations strategy but is systematically associated with a core attribute of financial reporting quality. Firms that mislead stakeholders about their environmental performance are also more likely to exhibit conservative financial reporting, underscoring the interconnected yet decoupled nature of corporate reporting behavior across domains. As stakeholders continue to demand greater transparency in both environmental and financial reporting, understanding these interconnections becomes increasingly critical for ensuring the integrity of corporate communication.

Chapter Three – Essay Two: Earnings Management and Corporate Greenwashing: Evidence from U.S. Listed Firms

Abstract

This study examines the relationship between earnings management and corporate greenwashing intensity using U.S. listed firms during 2003-2024. Drawing on institutional theory and impression management theory, I hypothesize that greenwashing and earnings management represent complementary forms of strategic corporate impression management. I estimate discretionary accruals via both the Modified Jones model and the performance-matched model of Kothari *et al.* (2005). My baseline results indicate that greenwashing intensity is positively and significantly associated with discretionary accruals across all specifications. I further address endogeneity concerns through lagged regressions, two-stage least squares (2SLS), and two-stage residual inclusion (2SRI) control function approaches, all of which corroborate my main findings. Cross-sectional analyses reveal that Big 4 audit quality and board diversity unexpectedly strengthen the greenwashing-earnings management nexus. Overall, my evidence suggests that greenwashing signals a broader opportunistic reporting orientation within the firm, extending beyond environmental disclosures into the domain of financial reporting.

JEL Classifications: M41, M14, G34, G32, Q56

Keywords: *greenwashing, earnings management, discretionary accruals, audit quality, board diversity, corporate sustainability*

1. Introduction

In an era of heightened stakeholder scrutiny over corporate environmental responsibility, firms face mounting pressure to demonstrate their commitment to sustainability. Investors, regulators, and consumers increasingly evaluate corporations not only on financial performance but also on environmental, social, and governance (ESG) criteria (Christensen *et al.,* 2021; Christensen *et al.,* 2022; Eccles *et al.,* 2014; Krüger, 2015). This shift has precipitated a proliferation of sustainability disclosures, with many firms producing elaborate environmental reports, carbon commitments, and green marketing campaigns. Yet a growing body of evidence suggests that a substantial portion of this disclosure activity constitutes greenwashing, i.e., the strategic practice of conveying a false impression of environmental responsibility through selective, exaggerated, or misleading communication (Avramov *et al.,* 2022; Delmas and Burbano, 2011; Marquis *et al.,* 2016).

Greenwashing represents a form of impression management in the non-financial domain (Bowen, 2014). Firms engage in greenwashing to cultivate legitimacy, reduce stakeholder scrutiny, and reap reputational benefits without incurring the costs of genuine environmental improvement (Kim and Lyon, 2015; Marquis *et al.,* 2016; Sneideriene and Legenzova, 2025; Suchman, 1995). The phenomenon is well-documented. Companies with poor environmental performance are often more likely to publish elaborate sustainability reports as symbolic tools to decouple their communication from operational reality (Mahoney *et al.,* 2013).

Earnings management, the discretionary manipulation of accruals to achieve desired financial reporting outcomes, represents the quintessential form of impression management in the financial reporting domain (Cade *et al.,* 2025; Dechow and Skinner, 2000; Healy and Wahlen, 1999). Prior literature has established that managers use accruals to smooth earnings, meet analyst forecasts, or avoid reporting losses (Black et al., 2022; Burgstahler and Dichev, 1997; DeGeorge *et al.,* 1999; Demerjian *et al.,* 2020). The Modified Jones model (Dechow *et al.,* 1995) and the performance-matched model of Kothari *et al.* (2005) have become the standard methodologies for estimating discretionary accruals in the accounting literature. The strategic misrepresentation in the non-financial domain (corporate greenwashing) and financial domain (earnings management) raises a fundamental research question: if managers are willing to manipulate environmental disclosures to shape external perceptions, are they also more likely to manipulate financial reports?

I develop my argument through two complementary theoretical lenses. First, impression management theory (Dunne et al., 2021; Goffman, 2023; Hooghiemstra, 2000) provides a unifying

framework for understanding greenwashing and earnings management as complementary behaviors operating in different reporting domains but serving the same strategic objective, namely, the construction of a favorable corporate image. This theory posits that individuals and organizations actively manage the impressions that external audiences form of them, and that when one channel of impression management is constrained, alternative channels will be exploited. In the corporate reporting context, greenwashing and earnings management are both tools of impression management. The former operates in the non-financial domain, projecting sustainability credentials, while the latter operates in the financial reporting domain, maintaining the appearance of stable, profitable operations. Recent evidence that firms engage in asset divestitures that improve ESG ratings without reducing actual pollution, while simultaneously achieving higher stock returns and lower compliance costs (Duchin et al., 2025), demonstrates how firms strategically manage impressions across both environmental and financial reporting domains. In addition, Baker *et al.* (2024) demonstrate that firms engage in diversity washing, making symbolic diversity commitments without substantive organizational changes, suggesting that impression management strategies span multiple non-financial disclosure domains.

Second, institutional theory (DiMaggio and Powell, 1983; Scott, 1995) provides a complementary lens by explaining why the institutional asymmetry between financial and environmental reporting domains creates conditions under which firms can simultaneously engage in both greenwashing and earnings management. Recent empirical work is broadly consistent with this institutional logic without itself constituting institutional theory: Krueger *et al.* (2024) show that mandatory ESG disclosure improves stock liquidity most where enforcement is strong, Fiechter *et al.* (2022) document real effects of a mandatory CSR reporting regime, and Christensen *et al.* (2022) show that ESG ratings diverge systematically across rating agencies. The financial reporting field is characterized by coercive isomorphism through mandatory GAAP compliance, SEC enforcement, and auditor gatekeeping, which constrains accrual manipulation (Becker *et al.,* 1998; DeAngelo, 1981; Lamoreaux *et al.,* 2023). By contrast, the environmental disclosure field remains loosely coupled, governed by fragmented, voluntary standards with limited assurance (Kim and Lyon, 2015; Marquis *et al.,* 2016; Christensen *et al.,* 2022). This institutional asymmetry creates structural conditions under which firms can simultaneously engage in earnings management within the financial reporting domain and greenwashing within the sustainability domain. The divergence in ESG ratings across agencies, documented by Christensen *et al.* (2022),

further illustrates how firms can strategically emphasize different dimensions of corporate virtue to manage stakeholder perceptions.

While both corporate greenwashing and earnings management involve the strategic manipulation of information to construct a desired corporate image, prior research has largely examined them in isolation. A notable exception is Mohapatra *et al.* (2025), who find that high ESG scores can lead to higher real earnings management, indicating possible greenwashing behavior, and that CEO duality moderates this relationship. Nevertheless, the direct link between greenwashing intensity and accrual-based earnings management has not been systematically investigated. This study fills this gap by examining whether greenwashing is positively associated with discretionary accruals.

Using a comprehensive sample of U.S. publicly listed firms from 2003 to 2024, I estimate discretionary accruals via both the Modified Jones model and the Kothari *et al.* (2005) performance-matched model. My baseline results reveal a positive and statistically significant association between greenwashing intensity and discretionary accruals. This finding is robust to the inclusion of firm-level controls, governance variables, and industry and year fixed effects. To address potential endogeneity, I employ lagged regressions, two-stage least squares (2SLS), and the two-stage residual inclusion (2SRI) control function approach (Terza *et al.,* 2008; Wooldridge, 2010). All three approaches confirm the positive association, alleviating concerns about reverse causality and omitted variable bias.

I further examine the moderating roles of audit quality and board diversity. Contrary to conventional governance expectations, I find that Big 4 audit quality strengthens the greenwashing-earnings management relationship, suggesting that high-audit-quality firms may be better able to engage in both practices simultaneously. Board diversity also strengthens the relationship, consistent with the view that greater diversity in board composition may make it more difficult to achieve unified oversight over complex reporting practices that span multiple disclosure domains. As a result, managers may have greater scope to coordinate environmental and financial reporting strategies in ways that are individually defensible but collectively misleading. An alternative explanation is that firms with more diverse boards are often subject to heightened stakeholder scrutiny and broader ESG expectations, increasing managerial incentives to present a consistently favorable image through both sustainability disclosures and financial reporting.

This study's findings contribute to several strands of literature. First, this study extends the greenwashing literature by establishing a direct link between symbolic environmental disclosure and financial reporting manipulation. While prior research has documented greenwashing as an impression management strategy in the non-financial domain (Marquis *et al.,* 2016; Sneideriene and Legenzova, 2025), this study demonstrates that this behavior extends into the financial reporting domain, suggesting a broader opportunistic reporting orientation within greenwashing firms.

Second, this study contributes to the earnings management literature by identifying greenwashing as a significant predictor of discretionary accruals. This study's results indicate that greenwashing intensity contains incremental information about a firm's propensity to manage earnings, beyond traditional determinants such as firm size, profitability, and growth opportunities. This finding suggests that stakeholders should view greenwashing not merely as an environmental communication issue but as a signal of potential financial reporting aggressiveness.

Third, moderation analyses offer nuanced insights into the institutional conditions that shape the greenwashing-earnings management nexus. The unexpected finding that Big 4 audit quality strengthens rather than weakens the relationship challenges conventional governance assumptions and suggests that high-quality auditors may not effectively constrain sophisticated, dual-domain impression management strategies (Li *et al.,* 2024). This result aligns with recent concerns that audit quality proxies based on auditor size may not capture the full complexity of auditor behavior (Aobdia et al., 2024; DeFond and Zhang, 2014). In contrast, board diversity shows a more complex pattern, with the main effect suggesting general monitoring benefits but the interaction effect indicating potential coordination challenges in detecting coordinated misrepresentation.

The remainder of the chapter is organized as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 describes the data and methodology. Section 4 reports the empirical results. Section 5 concludes.

2. Literature Review and Hypothesis Development

2.1 Greenwashing as Strategic Impression Management

Greenwashing can be understood as a specific form of impression management in which organizations actively shape stakeholder perceptions to cultivate a favorable public image (Bowen, 2014; Laufer, 2003; Siddique *et al.,* 2026). From an institutional perspective, greenwashing represents a decoupling mechanism. Firms adopt formal structures and policies for legitimacy while these remain disconnected from actual operational activities (Berg *et al.,* 2022; Bromley and Powell, 2012; Christensen *et al.,* 2022; Meyer and Rowan, 1977). When sustainability reporting is used for greenwashing rather than genuine disclosure, it tends to be overly positive, focusing solely on favorable aspects while omitting negative information, expenses, and challenges (Duchin *et al.,* 2025; Marquis *et al.,* 2016).

The strategic use of sustainability reports as impression management tools is well-documented across multiple disciplines. Firms employ textual and rhetorical manipulation techniques, including overly optimistic language, technical jargon, and selective disclosure, to influence readers and gain legitimacy (Berkin *et al.,* 2025; Cho *et al.,* 2015; Demaline, 2020). The impression management gap between sustainability reports and more neutral management reports has been shown to indicate the likelihood of greenwashing (Cho *et al.,* 2015; Sneideriene and Legenzova, 2025). Lyon and Montgomery (2015) distinguish between different forms of greenwashing, including selective disclosure, empty rhetoric, and symbolic adoption, each serving different strategic purposes. Delmas and Burbano (2011) identify information asymmetry and the absence of uniform standards as key conditions that enable greenwashing to persist.

Recent scholarship has provided increasingly sophisticated evidence on the mechanisms and consequences of greenwashing. Kim and Lyon (2015) develop the gap-model approach, measuring greenwashing as the divergence between environmental disclosure intensity and actual environmental performance, providing an objective metric that has been widely adopted. Duchin *et al.* (2025) document that firms strategically divest pollutive assets without reducing actual pollution, subsequently highlighting sustainability policies in conference calls and earning higher ESG ratings and lower financing costs, demonstrating that greenwashing can have real financial consequences. Bothello *et al.* (2023) examine CSR decoupling within business groups, finding that organizational complexity facilitates the separation between symbolic and substantive environmental actions. Bochkay *et al.* (2025) show that voluntary sustainability standards increase disclosure volume but do not necessarily eliminate greenwashing. Christensen *et al.* (2022) demonstrate that ESG ratings diverge systematically across rating agencies because firms

strategically emphasize different ESG dimensions, creating opportunities for impression management. Collectively, this literature establishes that greenwashing is not merely an isolated communication strategy but reflects a broader organizational orientation toward managing stakeholder impressions through strategic information manipulation.

2.2 Earnings Management: Theory, Measurement, and Determinants

Earnings management, the discretionary manipulation of reported earnings to achieve desired outcomes, has been a central topic in accounting research for decades. Healy and Wahlen (1999) provide a comprehensive review, defining earnings management as the purposeful intervention in the external financial reporting process with the intent of obtaining some private gain. Dechow and Skinner (2000) reconcile the views of academics, practitioners, and regulators on earnings management, noting that while some forms of earnings management may be efficient, others involve deliberate misrepresentation that undermines the integrity of financial reporting.

The accrual component of earnings is particularly susceptible to manipulation because it does not require contemporaneous cash transactions, making it less transparent to external stakeholders (Jones, 1991). The Modified Jones model (Dechow *et al.,* 1995) and the performance-matched model of Kothari *et al.* (2005) have become the standard methodologies for estimating discretionary accruals. Kothari *et al.* (2005) demonstrate that matching on performance improves the power and specification of discretionary accrual models, as firms with extreme performance tend to have abnormal accruals even in the absence of earnings management. Cohen *et al.* (2008) document the evolution of earnings management practices from accrual-based to real earnings management in the post-Sarbanes-Oxley period, demonstrating how regulatory changes can shift the form, but not necessarily the level, of managerial opportunism. Pincus *et al.* (2022) re-examine this substitution effect over an extended post-SOX period, finding that the decline in accrual-based earnings management and the rise in real earnings management persist well beyond the initial regulatory shock, suggesting a permanent structural shift in managerial reporting strategies. Grieser *et al.* (2021) provide further evidence that firms engage in real earnings management when they perform well, consistent with executives using operational manipulation to meet aggressive earnings targets even in the absence of accrual discretion. Dechow *et al.* (2022) show that accrual

heterogeneity significantly affects the inferences drawn from standard accrual quality metrics, highlighting the importance of careful model specification in detecting earnings management.

The determinants of earnings management have been extensively studied. DeGeorge *et al.* (1999) demonstrate that firms manage earnings to exceed three important thresholds, namely, positive earnings, prior period earnings, and analyst forecasts. Burgstahler and Dichev (1997) provide evidence of earnings management to avoid earnings decreases and losses. DeFond and Jiambalvo (1994) document that firms manipulate accruals to avoid debt covenant violations. More recently, Franz *et al.* (2014) show that firms in close proximity to debt covenant thresholds engage in both accrual-based and real earnings management, with the choice between methods depending on the proximity to violation and the expected costs of detection. Becker *et al.* (1998) and Francis and Krishnan (1999) provide evidence that Big 4 auditors constrain accrual-based earnings management, though more recent evidence suggests that auditor size alone may not capture the full complexity of audit quality (DeFond and Zhang, 2014; Rajgopal *et al.,* 2021). Lennox and Pittman (2010) demonstrate that Big 4 auditors may constrain blatant manipulation but may not detect more subtle forms of earnings management. Viana *et al.* (2022) provide cross-country evidence from 20 emerging markets that financially distressed firms engage in income-increasing accruals-based earnings management, and that such engagement is significantly attenuated for clients of Big 4 auditors, though with notable heterogeneity across the Big 4 firms themselves. Johnson *et al*. (2002) and Gul *et al*. (2003) find that auditor tenure and audit fees, respectively, influence financial reporting quality and earnings management among large audit firm clients, suggesting that audit pricing and auditor-client relationship duration are important dimensions of audit quality beyond auditor size.

The relationship between corporate governance and earnings management has also been extensively documented. Adams and Ferreira (2009) find that women on corporate boards improve governance and performance, though the mechanisms are complex. Arun *et al.* (2015) provide evidence on female directors and earnings management in UK companies. More recent evidence suggests these relationships are nuanced and context-dependent. Griffin *et al.* (2021) analyze boardroom gender diversity reforms across 47 countries and find that mandated gender quotas improve institutional monitoring effectiveness, but the impact on financial reporting quality varies with the strength of local enforcement institutions. Gow *et al.* (2023) examine board diversity and shareholder voting outcomes, finding that diverse boards face greater scrutiny from institutional

investors, which in turn constrains opportunistic reporting behavior. Hrazdil *et al.* (2023) document that top executive gender diversity is associated with higher financial reporting quality, particularly in firms with weak external governance mechanisms. Huang and Lu (2025) show that gender diversity performance, measured by the gender pay gap, moderates the relationship between female board representation and voluntary disclosure quality, suggesting that board diversity must be coupled with substantive pay equity to improve reporting outcomes. Collectively, this literature establishes that earnings management is a pervasive phenomenon driven by capital market pressures, contracting incentives, and governance weaknesses, and that external monitoring mechanisms play an important but imperfect role in constraining it.

2.3 The Intersection of Greenwashing and Earnings Management

Despite the extensive literatures on both greenwashing and earnings management, the direct relationship between these two forms of corporate misrepresentation remains underexplored. Both practices involve the strategic manipulation of information to construct a desired corporate image. Greenwashing operates in the non-financial domain, while earnings management operates in the financial reporting domain. The theoretical connection between these practices can be understood through the lens of impression management and institutional decoupling.

Impression management theory predicts that firms use multiple channels to construct and maintain favorable stakeholder perceptions (Dunne *et al.,* 2021; Hooghiemstra, 2000; Schlenker, 1980). When one channel of impression management is constrained by strong verification standards, such as the GAAP compliance and auditor gatekeeping that characterize financial reporting, managers may redirect their efforts toward channels with weaker institutional controls, such as environmental disclosure (Lyon and Montgomery, 2015). This displacement effect suggests that firms engaging in greenwashing may also exhibit higher levels of earnings management, as both practices reflect a common underlying orientation toward strategic information manipulation.

Several recent studies provide indirect evidence consistent with this complementarity argument. Cui *et al.* (2025) find that mandatory ESG disclosure reduces earnings management, while voluntary disclosure has no significant effect, implying that firms engaging in greenwashing under voluntary regimes face weaker constraints on accrual manipulation. Their finding suggests that the institutional context of environmental disclosure (i.e., mandatory versus voluntary) shapes the relationship between greenwashing and financial reporting quality. Moreover, Xue (2025)

finds that ESG disclosure improves investment efficiency through market forces, suggesting that disclosure quality has real economic consequences and that firms may use both financial and non-financial disclosure strategically to influence capital market perceptions. Kim *et al.* (2012) document that earnings quality is associated with corporate social responsibility. They find that firms with better CSR performance tend to have higher earnings quality, though the direction of causality remains debated.

Inderst and Opp (2025) provide a theoretical model showing that greenwashing in ESG funds marketed to retail investors can undermine the effectiveness of sustainable finance. Their analysis highlights that greenwashing is not merely a disclosure problem but can distort capital allocation, with implications for both environmental and financial outcomes. Mohapatra *et al.* (2025) find that high ESG scores can lead to higher real earnings management, indicating possible greenwashing behavior, and that CEO duality moderates this relationship. Their findings suggest that governance structures play an important role in determining whether ESG engagement translates into genuine improvement or symbolic compliance. DeFond and Zhang (2014), in their comprehensive literature review, note that the interaction between non-financial disclosure and financial reporting quality is an important but understudied area.

The institutional asymmetry between financial and environmental reporting domains provides a structural explanation for why greenwashing and earnings management might coexist. Financial reporting operates under mandatory compliance with GAAP, SEC enforcement, and rigorous auditor gatekeeping (Chy and Hope, 2021; DeAngelo, 1981; DeFond and Zhang, 2014; Mayberry *et al.,* 2024). Environmental disclosure, by contrast, has historically been voluntary, with heterogeneous standards and limited third-party assurance (Kim and Lyon, 2015; Marquis *et al.,* 2016; Christensen *et al.,* 2022). This asymmetry means that firms can face strong constraints on accrual manipulation in the financial domain while retaining substantial latitude for impression management in the environmental domain.

Christensen *et al.* (2022) demonstrate that ESG ratings diverge systematically across rating agencies, suggesting that the lack of standardized environmental reporting creates opportunities for strategic disclosure. Bochkay *et al.* (2025) find that voluntary sustainability standards increase disclosure volume but do not eliminate the potential for greenwashing. Baker *et al.* (2024) show that diversity washing follows patterns similar to greenwashing, suggesting that impression

management strategies may be a general organizational tendency that manifests across multiple disclosure domains.

Synthesizing the impression management displacement argument, the institutional asymmetry between reporting domains, and the recent empirical evidence on the complementarity of disclosure manipulation strategies, I expect a positive association between greenwashing and earnings management. Firms that engage more heavily in greenwashing are likely to also exhibit higher levels of discretionary accruals as part of a broader strategy of corporate impression management.

Hypothesis 1. *Greenwashing is positively associated with earnings management.*

2.4 The Moderating Role of Audit Quality

Audit quality represents one of the most important external monitoring mechanisms in corporate governance. Big 4 auditors are generally assumed to provide higher-quality audits because they possess greater expertise, more resources, stronger reputational capital, and a greater ability to detect and constrain opportunistic reporting behavior (Becker *et al.,* 1998; Cahan *et al.,* 2022; DeAngelo, 1981; Francis and Krishnan, 1999). From an agency perspective, Big 4 auditors serve as an external governance mechanism that can limit managerial opportunism by enhancing the credibility of financial statements and increasing the cost of manipulation (Che *et al.,* 2020; Jensen and Meckling, 1976; Rajgopal *et al.,* 2021).

The conventional expectation is that stronger audit oversight should reduce the extent to which firms can translate environmental misrepresentation into financial misreporting. Prior research provides support for this view. Becker *et al.* (1998) and Francis and Krishnan (1999) document that Big 4 auditors constrain accrual-based earnings management. Al-Shaer (2020) finds that audit quality moderates the relationship between ESG disclosures and earnings management. However, more recent evidence complicates this conventional view. DeFond and Zhang (2014) note that audit quality proxies based on auditor size may not capture the full complexity of auditor behavior. Lennox and Pittman (2010) demonstrate that Big 4 auditors may constrain blatant manipulation but may not detect more subtle forms of earnings management.

Krueger *et al.* (2024) document that mandatory ESG disclosure requirements have positive effects on stock liquidity only when mandates are implemented by government institutions and supported by robust informal enforcement, suggesting that audit quality alone may be insufficient

to constrain greenwashing. Duchin *et al.* (2025) find that sophisticated firms can engage in greenwashing despite strong external monitoring, as evidenced by their ability to divest pollutive assets while maintaining supply chain relationships that allow continued access to divested operations. Xue (2025) demonstrates that ESG disclosure improves investment efficiency through market forces, implying that the interaction between disclosure quality and external monitoring is more nuanced than traditional governance models suggest. These findings raise the possibility that Big 4 audit quality may not uniformly weaken the greenwashing-earnings management nexus.

An alternative perspective suggests that Big 4 auditors are disproportionately engaged by larger, more visible, and more complex firms that face heightened reputational pressure and stakeholder scrutiny. While these firms have stronger incentives to maintain a credible public image, recent evidence indicates that high-quality auditing may not uniformly constrain aggressive reporting behavior. Koch and Salterio (2017) demonstrate that auditor affinity for economically important clients systematically reduces the rigor of proposed adjustments to aggressive accounting positions, implying that the very prominence that attracts Big 4 auditors can simultaneously compromise auditor skepticism. Consistent with this view, Backof *et al.* (2016) find that Big 4 auditors' judgment frameworks frequently center on client ramifications rather than principles-oriented reasoning, suggesting that client pressure and reputational interdependence may dilute the constraining effect of external scrutiny. Given the competing theoretical predictions, I formulate the following hypothesis:

Hypothesis 2. *Big 4 audit quality negatively moderates the relationship between greenwashing and earnings management.*

2.5 The Moderating Role of Board Diversity

Board diversity is another important governance characteristic that may shape the relationship between greenwashing and earnings management. Diverse boards bring together directors with different backgrounds, experiences, cognitive frameworks, and perspectives, which can improve decision-making quality and reduce groupthink (Adams and Ferreira, 2009; Carter *et al.,* 2010; Genin *et al.,* 2023). From a resource dependence perspective, diverse boards expand the range of information, skills, and stakeholder connections available to the firm, improving the board's ability to assess the credibility of managerial claims (Hillman and Dalziel, 2003).

In the context of greenwashing, a more diverse board may be better positioned to question inconsistencies between environmental claims and actual performance. Similarly, such boards may be more vigilant in overseeing financial reporting quality and discouraging earnings management (Arun *et al.,* 2015; Khan *et al.,* 2022; Krishnan and Parsons, 2008). Corporate governance theory therefore suggests that board diversity should act as a disciplining mechanism, reducing the extent to which firms use greenwashing and earnings management together as complementary impression management tools. This discussion leads to the following hypothesis.

Hypothesis 3. *Board diversity negatively moderates the relationship between greenwashing and earnings management.*

3. Data and Methodology

3.1 Sample Selection

This study's sample comprises firm-year observations from U.S. publicly listed companies over the period 2003 to 2024. The sample period was chosen for the following reasons. First, 2003 marks the first full fiscal year after the Sarbanes-Oxley Act, ensuring that all observations operate under the standardized U.S. disclosure and audit regime, thereby mitigating structural breaks in financial reporting quality that would confound accrual-based measures. Second, the early 2000s coincide with the first wave of comprehensive, machine-readable environmental disclosure databases (e.g., MSCI/KLD, Refinitiv/ASSET4), which are necessary to construct reliable greenwashing scores that require both disclosure intensity and verified environmental performance data. Finally, the longitudinal depth of the panel satisfies the data requirements for lagged-variable specifications, propensity score matching, and two-stage instrumental-variable approaches (2SLS and 2SRI) by leveraging persistent firm-level reporting norms to satisfy instrument relevance conditions without severe sample attrition.

All financial, market, governance, and environmental data are sourced from LSEG Workspace, which provides comprehensive and integrated firm-level data for the full sample period. This study requires firms to have sufficient data to calculate total accruals, cash flows from operations, and the variables necessary for estimating the Modified Jones and Kothari *et al.* (2005) models. This study further requires non-missing values for my greenwashing measure and control variables. Following prior literature, this study uses the Industry Classification Benchmark (ICB)

system and excludes firms classified under ICB code 30 (Financials) due to their unique regulatory environments and accrual structures. All continuous variables used in the estimation of the accrual models are winsorized at the 2.5th and 97.5th percentiles to mitigate the influence of outliers. The final sample comprises 21,904 firm-year observations.

3.2 Variable Measurement

3.2.1 Measuring Earnings Management

I estimate discretionary accruals as a proxy for earnings management using both the Modified Jones model (Dechow *et al.,* 1995) and the performance-matched model proposed by Kothari *et al.* (2005). Total accruals (TA_{it}) are computed as the difference between net income (NI_{it}) and cash flow from operations (CFO_{it}), scaled by lagged total assets ($A_{i,t-1}$) (Eq. 1).

$$TA_{it} = \frac{NI_{it} - CFO_{it}}{A_{i,t-1}} \tag{1}$$

Following prior literature, I estimate the accrual models cross-sectionally for each industry-year. For the Modified Jones model, total accruals (TA_{it}) scaled by lagged assets ($A_{i,t-1}$) are regressed on the inverse of lagged total assets, the change in revenues (ΔREV_{it}) adjusted for the change in receivables (ΔREC_{it}), and gross property, plant, and equipment (PPE_{it}), as specified in Eq. 2:

$$\frac{TA_{it}}{A_{i,t-1}} = \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{i,t-1}}\right) + \epsilon_{it} \tag{2}$$

For the Kothari *et al.* (2005) model, I extend Eq. 2 by including lagged return on assets ($ROA_{i,t-1}$) to control for firm performance.

$$\frac{TA_{it}}{A_{i,t-1}} = \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{it} - \Delta REC_{it}}{A_{i,t-1}}\right) + \alpha_3\left(\frac{PPE_{it}}{A_{i,t-1}}\right) + \alpha_4 ROA_{i,t-1} + \epsilon_{it} \tag{3}$$

To mitigate the influence of outliers, all continuous variables used in the estimation of the accrual models are winsorized at the 2.5th and 97.5th percentiles prior to model estimation. The accrual models are estimated only for industry-year groups with at least ten observations to ensure

reliable coefficient estimates. The residuals from Eq. 2 and Eq. 3 represent non-discretionary accruals, and discretionary accruals (DA_{it}) are computed as the difference between total accruals and non-discretionary accruals (NDA_{it}), as shown in Eq. 4:

$$DA_{it} = \frac{TA_{it}}{A_{i,t-1}} - NDA_{it} \quad (4)$$

Consistent with prior studies (Chen *et al.,* 2024), the estimated discretionary accruals are further winsorized at the 2.5th and 97.5th percentiles. I use the absolute value of discretionary accruals (i.e., $|DA_{it}|$) as my primary measure of earnings management, where higher values indicate greater managerial discretion in financial reporting. As a robustness check, I employ both the Modified Jones and Kothari *et al.* (2005) models. The two measures are highly correlated ($r = 0.95$, $p < 0.01$), suggesting that my findings are not sensitive to the choice of accrual estimation model.

3.2.2 Measuring Greenwashing

My greenwashing measure (*GWScore*) captures the divergence between a firm's environmental disclosure and its actual environmental performance. Following the approach in greenwashing literature (e.g., Yu *et al.,* 2026), I construct this measure as the standardized difference between environmental disclosure intensity and environmental performance metrics. Higher values of *GWScore* indicate greater greenwashing intensity, that is, more symbolic environmental disclosure relative to actual environmental outcomes. The variable is winsorized at the 1st and 99th percentiles to reduce the influence of extreme observations.

3.2.3 Control Variables

This study controls for a comprehensive set of firm-level determinants that extant literature has identified as influencing earnings management, with all continuous variables winsorized to attenuate the influence of extreme observations. Specifically, I include firm size (*Size*), measured as the natural logarithm of total assets, because larger firms are subject to heightened regulatory and market scrutiny and typically maintain more sophisticated internal control systems, which may constrain accrual-based manipulation (Becker *et al.,* 1998; Cui *et al.,* 2025). I also control for capital structure through leverage (*Leverage*), defined as total debt scaled by total assets, because highly leveraged firms face stronger incentives to manage reported earnings to circumvent debt

covenant violations (DeFond and Jiambalvo, 1994; Dyreng *et al.,* 2022). Profitability, proxied by return on assets (*ROA*), is controlled for because more profitable firms encounter diminished pressure to artificially inflate earnings (Kothari *et al.,* 2005; Mohapatra *et al.,* 2025), and sales growth (*SalesGrowth*), computed as the percentage change in revenues, is included given that high-growth firms face particularly intense capital market pressure to meet or exceed earnings benchmarks (Skinner and Sloan, 2002; Teoh *et al.*, 1998).

Following Dechow & Dichev (2002), this study incorporates operating cash flow (*CFO*), measured as cash flow from operations scaled by lagged total assets, to account for the mechanical relation between accruals and underlying cash flow realizations. This study further includes an indicator variable for loss firms (*Loss*), as prior evidence suggests that firms reporting negative net income engage in more aggressive earnings management to avoid the adverse consequences of reporting losses (Burgstahler and Dichev, 1997; Le *et al.,* 2023), and firm age (*LnAge*), measured as the natural logarithm of firm age, because more mature firms tend to possess established reporting practices and face attenuated incentives to manage earnings (Alsaeed, 2006; Dechow and Skinner, 2000; Gul *et al.*, 2009). Finally, I control for external monitoring and corporate governance quality through an indicator for Big 4 auditor affiliation (*Big4*), as well as board size (*BoardSize*) and board independence (*BoardIndep*), measured as the number of directors and the percentage of independent directors, respectively.

3.3 Descriptive Statistics and Collinearity Analysis

Table 2.1 presents the descriptive statistics for the key variables used in the analysis. The mean absolute discretionary accrual is 0.0601 with a standard deviation of 0.0621, ranging from 0.0000 to 0.2562. This indicates that, on average, the magnitude of earnings management via discretionary accruals amounts to approximately 6.0% of lagged total assets, with considerable cross-sectional variation (standard deviation of 6.2%). The minimum value of zero suggests that some firms exhibit no detectable accrual-based earnings management, while the maximum value of 0.2562 reveals that certain firms engage in aggressive manipulation equivalent to roughly 25.62% of lagged total assets. These statistics are consistent with prior studies employing the Kothari *et al.* (2005) model in similar settings (Cohen *et al.,* 2008; Kothari *et al.,* 2005; Nguyen, 2024). For example, Nguyen (2024) reports a mean (median) absolute value of discretionary accruals of 0.087 (0.062) with a standard deviation of 0.084 using a modified Jones specification, which is

comparable in magnitude to the performance-matched Kothari *et al.* (2005) estimates documented here.

The greenwashing score (*GWScore*) exhibits a mean of 0.0772 and a standard deviation of 1.5712, with values ranging from -1.9871 to 4.4154. The negative minimum value indicates that some firms disclose less environmental information than their performance would predict (i.e., they "brownwash"), while the positive maximum reflects substantial greenwashing intensity. The brownwash phenomenon is consistent with Bochkay *et al*. (2025), who show that voluntary sustainability standards increase disclosure volume but do not eliminate selective under-reporting. The distribution is right-skewed, with a median of -0.292, suggesting that the typical firm in my sample engages in relatively modest greenwashing. This distributional pattern is consistent with Kim and Lyon (2015) and Marquis *et al.* (2016), who document that egregious greenwashing is concentrated among a subset of firms facing intense legitimacy pressures.

Firm size (*Size*), measured as the natural logarithm of total assets, averages 13.8914, which translates to approximately $1.08 billion in median total assets. This is consistent with the population of U.S. exchange-listed non-financial firms in Compustat over the 2003–2024 period, and the substantial variation is expected given the inclusion of both mid-cap industrial firms and large multinationals. The size distribution aligns with recent U.S. panel studies of earnings quality (Cui *et al.,* 2025; Xue, 2025). Leverage (*Leverage*) shows high dispersion, with a mean of 26.3382 and a maximum of 474.4265, reflecting the presence of highly leveraged firms. The mean leverage ratio of approximately 26% is consistent with prior U.S. non-financial firm panels (Fama and French, 2004; Gerged *et al.,* 2023).

The loss dummy (*Loss*) indicates that approximately 32.80% of firm-year observations report negative net income. This proportion is consistent with the well-documented "big bath" and loss-avoidance literature. Fama & French (2004) established that roughly 30–35% of broad U.S. samples report losses, and Le *et al.* (2023) confirm that loss-avoidance remains a primary driver of earnings management in contemporary capital markets.

Board independence averages 76.99%. The high proportion of independent directors reflects the post-SOX governance environment and the NYSE/NASDAQ listing requirements implemented in 2003–2004. This level is consistent with Linck et al. (2008), which documents that U.S. boards have stabilized at roughly 75–80% independence following the 2003 regulatory reforms. Board diversity averages 20.18%, with considerable cross-sectional variation. This figure

aligns precisely with the secular trend in U.S. board composition during the 2020–2024 period. Denis and Wang (2024) document that the fraction of female directors in U.S. listed firms hovered between 15% and 22% during the 2015–2020 window, rising toward 25% only after the SEC's approval of Nasdaq's board diversity disclosure rules in 2021. The sample mean of 20.1833% therefore reflects the typical gender composition of U.S. boards immediately preceding and during the early implementation of mandatory diversity disclosure.

Table 2.2 presents the variance inflation factors. To assess multicollinearity among the independent variables, I compute variance inflation factors (VIFs) for all regressors. As reported in the table, all VIF values range from 1.03 to 3.23, with a mean VIF of 1.62, well below the conventional threshold of 10 (and the more conservative threshold of 5). This suggests that multicollinearity does not pose a significant concern in the regression models.

Table 2.1: Summary Statistics.

This table presents descriptive statistics for the main variables employed in my analysis. The sample comprises 21,904 firm-year observations spanning 2003-2024. The dependent variable is |DA|, the absolute value of performance-matched discretionary accruals estimated using the modified Jones model. GWScore denotes the corporate greenwashing intensity score. All continuous variables are winsorized at the 2.5th and 97.5th percentiles to mitigate the influence of outliers. Variable definitions are provided in Appendix A.

Variable(s)	Mean	SD	Min	p25	p50	p75	Max
|DA|	0.0601	0.0621	0.0000	0.0161	0.0385	0.0804	0.2562
GWScore	0.0772	1.5712	-1.9871	-1.1184	-0.2922	0.8782	4.4154
Size	13.8914	2.2824	8.9411	12.3935	14.0101	15.5412	18.3051
Leverage	26.3382	84.7325	1.1321	2.4102	3.7612	7.7894	474.4265
ROA	-1.4761	21.8916	-85.6104	-2.1501	4.5804	9.0504	26.4606
SalesGrowth	0.1366	0.3627	-0.5165	-0.0274	0.0721	0.2101	1.5642
CFO	0.0394	0.1815	-0.6482	0.0201	0.0762	0.1295	0.2981
Loss	0.3286	0.4693	0.0000	0.0000	0.0000	1.0000	1.0000
LnAge	2.8988	0.9472	0.6931	2.3034	2.9441	3.5262	4.6444
Big4	0.8229	0.3834	0.0000	1.0000	1.0000	1.0000	1.0000
BoardSize	9.4893	2.3685	5.0000	8.0000	9.0000	11.0000	15.0000
BoardIndep	76.9965	16.3756	0.0000	71.4300	81.8200	88.8900	100.0000
BoardDiversity	20.1833	12.7442	0.0000	11.1100	20.0000	28.5700	100.0000

Table 2.2: Variance Inflation Factor (VIF)

This table reports variance inflation factors (VIF) and tolerance values (1/VIF) for all regressors included in the model. The dependent variable, discretionary accruals (DA), is excluded as VIF applies only to regressors. A VIF value below 10 (or, under the more conservative threshold, below 5) indicates the absence of problematic multicollinearity. The mean VIF across all regressors is 1.62.

Variable	**VIF**	**1/VIF**
GWScore	1.74	0.575333
Size	2.27	0.439581
Leverage	1.05	0.952856
ROA	3.23	0.309765
SalesGrowth	1.03	0.969527
CFO	2.39	0.418776
Loss	1.76	0.568067
LnAge	1.14	0.879833
Big4	1.17	0.853476
BoardSize	1.46	0.686443
BoardIndep	1.10	0.907480
BoardDiversity	1.16	0.864819
Mean VIF	**1.62**	

3.4 Empirical Models

This study's baseline regression model takes the following form:

$$|DA_{it}| = \beta_0 + \beta_1 GWScore_{it} + \sum_j \gamma_j Controls_{jit} + \mu_i + \lambda_t + \epsilon_{it} \quad (5)$$

where $|DA_{it}|$ is the absolute value of discretionary accruals, $GWScore$ is the greenwashing score, $Controls_{jit}$ represents the vector of control variables, μ_i denotes firm fixed effects, λ_t denotes year fixed effects, and ϵ_{it} is the error term. Standard errors are clustered at the firm level to account for serial correlation.

To address potential endogeneity between greenwashing and earnings management, I employ several strategies. First, I estimate models using lagged greenwashing scores (*LagGWScore*) to establish temporal ordering and alleviate concerns about contemporaneous correlation and reverse causality. Second, I instrument current greenwashing scores with their two-period lagged values and estimate the model via Two-Stage Least Squares (2SLS). This approach addresses omitted variable bias and reverse causality by exploiting the predictive power of past greenwashing behavior for current greenwashing intensity. Finally, following Wooldridge (2010) and Terza *et al.* (2008), I employ the control function approach using Two-Stage Residual Inclusion (2SRI). In the first stage, I regress current greenwashing scores on their two-period lagged values and all control variables. The residuals from this regression, which capture the portion of greenwashing behavior unexplained by observable factors, are then included in the second-stage earnings management regression. The significance of the residual term provides a direct test for endogeneity.

4. Empirical Results

4.1 Baseline Results

Table 2.3 reports the baseline regression results examining the relationship between corporate greenwashing and earnings management. Column (1) and (2) of Table 2.3 present results using the Kothari *et al.* (2005) performance-matched model, while column (3) presents results using the Modified Jones model (Dechow *et al.,* 1995). All specifications include firm-level controls and industry and year fixed effects.

Across all three specifications, the coefficient on the greenwashing score is positive and statistically significant at the 1% level. In the Kothari *et al.* (2005) base model (Column 1), the coefficient on *GWScore* is 0.0013 (t = 3.87). In the Kothari *et al.* (2005) extended model (Column 2), which includes governance controls, the coefficient is 0.0016 (t = 4.44). In the Modified Jones extended model (Column 3), the coefficient is 0.0015 (t = 4.11). These results indicate that firms with higher levels of greenwashing exhibit significantly higher levels of discretionary accruals, suggesting that symbolic environmental disclosure is associated with more aggressive financial reporting behavior.

These results are consistent with the impression-management perspectives in the sustainability-reporting literature, which posit that firms engaging in symbolic environmental disclosure (greenwashing) often maintain a façade of environmental responsibility that is decoupled from actual performance (Christensen *et al.,* 2021). From an agency-theory viewpoint, managers may use sustainability reporting as a strategic tool to camouflage earnings-management activities, particularly when such disclosures are decoupled from real environmental outcomes (Prior et al., 2008). The positive association between greenwashing and discretionary accruals documented here suggests that firms that mislead stakeholders through inflated environmental claims are also more likely to engage in accrual-based earnings manipulation, reflecting a broader pattern of managerial opportunism in both sustainability and financial reporting (Gerged *et al.,* 2023; Mao *et al.,* 2024; Mohapatra *et al*., 2025). These results are also consistent with recent evidence that environmental impression management and financial reporting manipulation represent complementary strategic behaviors. Cui *et al.* (2025) demonstrate that voluntary ESG disclosure fails to constrain earnings management, whereas mandatory disclosure does, implying that firms operating in weakly regulated sustainability environments, precisely the condition captured by high GW-scores, retain latitude for accrual manipulation. Mohapatra *et al.* (2025) further establish that high ESG scores can coincide with elevated real earnings management, indicating possible greenwashing behavior that extends into the financial reporting domain.

The magnitude of the effect is economically meaningful. A one-standard-deviation increase in the greenwashing score (1.5712) is associated with an increase in absolute discretionary accruals of approximately 0.0020 to 0.0025 (i.e., the point estimate ranges from 0.0013 to 0.0016, then $1.5712 \times 0.0013 = 0.0020$ and $1.5712 \times 0.0016 = 0.0025$) which represents roughly 3.33% (=0.0020/0.0601) to 4.16% (=0.0025/0.0601) of the mean discretionary accruals (0.0601). This

effect size is comparable to other documented determinants of earnings management in the literature (Gerged *et al.,* 2023; Xue, 2025).

The control variables are generally consistent with prior literature. Firm size is negatively associated with earnings management across all specifications, indicating that larger firms engage in less discretionary accrual manipulation, potentially due to greater scrutiny and more developed internal controls (Becker *et al.,* 1998; Cui *et al.,* 2025). Profitability (*ROA*) is also negatively related to discretionary accruals, consistent with the notion that more profitable firms face less pressure to manipulate earnings (Kothari *et al.,* 2005; Mohapatra *et al.,* 2025). In contrast, sales growth is positively and significantly associated with earnings management, suggesting that high-growth firms may face stronger incentives to meet market expectations (Skinner and Sloan, 2002; Teoh *et al.,* 1998).

Operating cash flow is positively related to discretionary accruals, reflecting the mechanical and economic relationship between accruals and cash flows (Cui *et al.,* 2025; Dechow, 1994). Firms reporting losses exhibit significantly higher discretionary accruals, consistent with income-smoothing or "big bath" behavior (Burgstahler and Dichev, 1997; Le *et al.,* 2023). Firm age is negatively associated with earnings management, indicating that more mature firms engage in less opportunistic reporting (Dechow and Skinner, 2000).

With respect to governance variables, board independence is negatively and significantly associated with discretionary accruals, suggesting that more independent boards play an effective monitoring role in constraining earnings management (Chen *et al.,* 2015; Klein, 2002). In contrast, Big 4 audit status and board size are not statistically significant in the extended models, indicating limited evidence that these factors independently affect accrual-based earnings management in this setting (Chatterjee and Rakshit, 2023). Importantly, the results are highly consistent across both accrual models. The magnitude, sign, and statistical significance of the key variables, particularly the greenwashing measure, remain stable. This consistency reinforces the robustness of my findings and suggests that the documented relationship between greenwashing and earnings management is not sensitive to the choice of discretionary accrual estimation model.

4.2 Lagged Analysis

To establish temporal ordering and alleviate concerns about reverse causality, I estimate lagged regressions in which the greenwashing score from the previous year predicts current-year discretionary accruals.

Column (4) of Table 2.3 reports the results. The coefficient on lagged greenwashing (*LagGWScore*) is positive and statistically significant with a point estimate of 0.0013 and a *p*-value of 0.01, indicating that firms with higher greenwashing in the previous year are more likely to engage in greater earnings management in the current year. This finding supports the temporal ordering of the relationship and alleviates concerns that the observed association is merely contemporaneous or driven by reverse causality. The control variables largely retain their expected signs and significance levels, reinforcing the reliability of my findings.

Table 2.3: Corporate Greenwashing and Earnings Management.
This table reports regression estimates examining the relation between corporate greenwashing and earnings management. The dependent variable in all specifications is the absolute value of discretionary accruals (|DA|). Column (1) presents baseline results using performance-matched discretionary accruals estimated following Kothari et al. (2005) with firm-level controls. Columns (2) and (3) present extended specifications that augment the baseline model with governance controls, using Kothari and modified Jones discretionary accruals, respectively. Column (4) reports results using lagged greenwashing score. Robust standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable(s)	(1) Kothari	(2) Kothari Extended	(3) Modified Jones Extended	(4) Kothari Extended
GWScore	0.0013***	0.0016***	0.0015***	
	(0.0003)	(0.0004)	(0.0004)	
LagGWScore				0.0013***
				(0.0003)
Size	-0.0062***	-0.0056***	-0.0055***	-0.0054***
	(0.0004)	(0.0005)	(0.0006)	(0.0005)
Leverage	0.0000*	0.0000	0.0000	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
ROA	-0.0009***	-0.0009***	-0.0012***	-0.0008***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
SalesGrowth	0.0217***	0.0205***	0.0201***	0.0211***
	(0.0020)	(0.0021)	(0.0023)	(0.0022)
CFO	0.0332**	0.0352**	0.0478***	0.0298**
	(0.0131)	(0.0141)	(0.0155)	(0.0146)
Loss	0.0089***	0.0093***	0.0075***	0.0098***
	(0.0014)	(0.0015)	(0.0017)	(0.0015)
LnAge	-0.0031***	-0.0029***	-0.0029***	-0.0023***
	(0.0005)	(0.0006)	(0.0006)	(0.0006)
Big4		-0.0024	-0.0024	-0.0014
		(0.0023)	(0.0026)	(0.0024)
BoardSize		-0.0003	-0.0003	-0.0004
		(0.0003)	(0.0003)	(0.0003)
BoardIndep		-0.0001***	-0.0001***	-0.0001**
		(0.0000)	(0.0000)	(0.0000)
Firm Fixed Effects	YES	YES	YES	YES
Industry Fixed Effects	YES	YES	YES	YES
Observations	21,904	19,947	19,947	18,715
R^2	0.1890	0.1840	0.1960	0.1740

4.3 Endogeneity Tests

4.3.1 2SLS

The relationship between greenwashing and earnings management is potentially endogenous because the two choices may be simultaneously determined by common managerial incentives, or because past earnings-management behavior may shape subsequent disclosure strategies (reverse causality). To address this concern, I employ a two-stage least squares (2SLS) estimator that isolates the exogenous variation in greenwashing using two-period lagged greenwashing scores as instrumental variables. Lagged values satisfy the relevance condition because prior disclosure choices are highly correlated with current greenwashing practices, and they satisfy the exclusion restriction because lagged greenwashing cannot be directly affected by current-period discretionary accruals or their unobserved determinants (Terza *et al.*, 2008). This approach is widely used in earnings-management research to purge endogeneity bias arising from simultaneity and omitted variables (Chen *et al.,* 2017).

Column (1) of Table 2.4 reports the results. It shows that *GWScore* is positive and highly significant in the second stage with a point estimate of 0.0023 and a *p*-value less than 0.01, indicating that firms with higher greenwashing scores are associated with higher levels of discretionary accruals even after correcting for endogeneity concerns. This finding supports the hypothesis that greenwashing is positively related to earnings management even after addressing potential omitted variable bias and reverse causality. The 2SLS coefficient is larger than the OLS estimates, suggesting that endogeneity may have biased the OLS coefficients downward. Among the control variables, size and ROA are both negatively and significantly associated with earnings management, while sales growth, operating cash flow, and loss status are positively significant. These patterns are consistent with the baseline results and prior literature.

4.3.2 2SRI

I further employ the control function approach (Two-Stage Residual Inclusion, 2SRI) following Terza *et al.* (2008) and Wooldridge (2010). Column (2) of Table 2.4 reports the results. The coefficient on the residual term (*GWResidual*) is statistically significant with a point estimate of −0.0014 and a *p*-value higher than 0.05, confirming the presence of endogeneity in my baseline specification. After correcting for this endogeneity, the main coefficient of interest remains positive and highly significant with a point estimate of 0.0023 and a *p*-value less than 0.01. The

similarity of this estimate to my 2SLS results provides robust evidence that greenwashing behavior has a causal effect on earnings management practices. All control variables maintain their expected signs and significance levels, reinforcing the reliability of my findings.

Table 2.4: Endogeneity: Two-Stage Least Squares and Control Function Estimates.
This table presents endogeneity-corrected estimates of the relation between greenwashing and earnings management. Column (1) reports two-stage least squares (2SLS) estimates where the greenwashing score is treated as endogenous. Column (2) reports control function estimates obtained via the two-stage residual inclusion (2SRI) approach; the inclusion of the first-stage residual (GWResidual) provides a direct test of endogeneity. The dependent variable in both specifications is the absolute value of performance-matched discretionary accruals estimated following Kothari *et al.* (2005). Robust standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. All continuous variables are winsorized at the 2.5th and 97.5th percentiles.

Variable(s)	(1) 2SLS	(2) 2SRI
GWScore	0.0023***	0.0023***
	(0.0007)	(0.0007)
GWResidual		-0.0014*
		(0.0007)
Size	-0.0056***	-0.0056***
	(0.0007)	(0.0007)
Leverage	0.0000	0.0000
	(0.0000)	(0.0000)
ROA	-0.0009***	-0.0009***
	(0.0001)	(0.0001)
SalesGrowth	0.0204***	0.0204***
	(0.0025)	(0.0025)
CFO	0.0324**	0.0324**
	(0.0159)	(0.0160)
Loss	0.0104***	0.0104***
	(0.0016)	(0.0016)
LnAge	-0.0022***	-0.0022***
	(0.0006)	(0.0006)
Big4	-0.0006	-0.0006
	(0.0025)	(0.0025)
BoardSize	-0.0004	-0.0004
	(0.0003)	(0.0003)
BoardIndep	-0.0001*	-0.0001*
	(0.0000)	(0.0000)
Observations	16,076	16,076
R^2	0.1687	0.1700
Kleibergen-Paap LM Stat	12.35 (p-value: 0.000)	
Cragg-Donald F-stat	12.35	
Kleibergen-Paap Wald F	15.31	
Hansen J-stat	5.21 (p-value: 0.023)	

4.4 Moderation Analysis

4.4.1 The Moderating Role of Big 4 Audit Quality

I examine whether audit quality moderates the relationship between greenwashing and earnings management by interacting *GW-Score* with a Big 4 auditor dummy. Big 4 auditors possess superior resources and reputational incentives that enhance audit quality and constrain managerial opportunism (Che *et al.,* 2020). I therefore expect that Big 4 audit quality attenuates the positive association between greenwashing and earnings management by limiting managerial discretion to simultaneously manipulate sustainability narratives and accruals. Column (1) of Table 2.5 reports the results. The interaction term (i.e., Big4 × GWScore) is positive and statistically significant with a point estimate of 0.0033 and a *p*-value of 0.024, indicating that the effect of greenwashing on earnings management is significantly stronger for firms audited by Big 4 firms. Specifically, for non-Big 4 firms, greenwashing has no significant association with earnings management with a point estimate of −0.0016 and a *p*-value of 0.271. However, for Big 4 auditees, the relationship becomes positive and significant with a point estimate of 0.0017 and a *p*-value less than 0.05.

This unexpected finding suggests that high-audit-quality firms may be better able to engage in both greenwashing and earnings management simultaneously, possibly due to their greater sophistication in managing stakeholder perceptions and regulatory scrutiny. These results highlight the importance of considering institutional context when examining corporate misrepresentation behaviors. Rather than acting as a constraint, high-quality auditing may inadvertently enable firms to pursue aggressive reporting strategies when engaging in greenwashing activities. This finding is consistent with the notion that Big 4 auditors, while constraining blatant manipulation, may not detect or deter more subtle forms of earnings management that are coordinated with sophisticated impression management strategies (Lennox and Pittman, 2010).

4.4.2 The Moderating Role of Board Diversity

I examine whether board diversity moderates the greenwashing-earnings management relationship. Drawing on Birindelli *et al.* (2024), gender-diverse boards strengthen monitoring over sustainability disclosures and attenuate greenwashing behavior. Coupled with Zalata *et al.* (2022) evidence that female directors with financial expertise constrain earnings management, I expect

board diversity to weaken the positive association between greenwashing and earnings management.

Column (2) of Table 2.5 reports the results. The interaction term between board diversity and greenwashing (i.e., BoardDiversity × GWScore) is positive and marginally significant with a point estimate of 0.00003 and a *p*-value between 0.05 and 0.10, while the main effect of board diversity is negative and significant (β=−0.0002, p<0.01). The main effect of greenwashing remains positive and marginally significant (β=0.0010, p<0.10).

These results suggest that while board diversity is generally associated with lower levels of earnings management (i.e., consistent with Adams and Ferreira, 2009), the moderating effect on the greenwashing–earnings management nexus is more nuanced. The positive interaction coefficient indicates that the positive association between greenwashing and earnings management is somewhat stronger in firms with more diverse boards, which contrasts with my theoretical prediction in Hypothesis 3. This unexpected finding may reflect the complexity of board diversity effects. While diverse boards may improve monitoring in general, they may also introduce coordination challenges or cognitive diversity that complicates the detection of coordinated impression management strategies spanning both environmental and financial reporting domains. Alternatively, diverse boards may be associated with firms that face greater stakeholder pressure to demonstrate both environmental and financial performance, inadvertently creating stronger incentives for dual-domain impression management.

Finally, I also examine whether financially distressed firms (i.e., those with the *Loss* dummy equal to one) exhibit a stronger association between greenwashing and earnings management by interacting *GWScore* with a loss dummy. In untabulated results, I find that while loss firms engage in significantly more earnings management overall (β=0.0099, p<0.001), the interaction term between loss status and greenwashing is not statistically significant (β=0.0009, p=0.228). This suggests that both profitable and loss-making firms respond similarly to greenwashing pressures in terms of earnings management behavior. The positive and highly significant main effect of *GWScore* with a point estimate of 0.00135 and a *p*-value less than 0.001 remains robust across financial conditions, indicating that the relationship between environmental misrepresentation and earnings manipulation is not contingent on financial distress.

Table 2.5: Moderating Effects of External Monitoring and Board Diversity.

This table presents OLS regression estimates examining the moderating roles of Big 4 auditor affiliation and board diversity in the relation between greenwashing and earnings management. The dependent variable in both specifications is the absolute value of performance-matched discretionary accruals estimated following Kothari *et al.* (2005). Column (1) includes the interaction between Big 4 auditor affiliation (Big4) and the greenwashing score (GWScore). Column (2) includes the interaction between board diversity (BoardDiversity) and GWScore. Robust standard errors clustered at the firm level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. All continuous variables are winsorized at the 2.5th and 97.5th percentiles.

Variable(s)	**(1) Big4**	**(2) BoardDiversity**
GWScore	−0.0016	0.0010*
	(0.0014)	(0.0005)
Big4	−0.0006	−0.0022
	(0.0025)	(0.0023)
BoardDiversity		−0.0002***
		(0.0000)
Big4 × GWScore	**0.0033****	
	(0.0014)	
BoardDiversity × GWScore		**0.0001***
		(0.0000)
Size	−0.0054***	−0.0053***
	(0.0005)	(0.0005)
Leverage	0.0000	0.0000
	(0.0000)	(0.0000)
ROA	−0.0009***	−0.0009***
	(0.0001)	(0.0001)
SalesGrowth	0.0203***	0.0201***
	(0.0022)	(0.0022)
CFO	0.0367***	0.0375***
	(0.0141)	(0.0141)
Loss	0.0101***	0.0100***
	(0.0015)	(0.0015)
LnAge	−0.0026***	−0.0025***
	(0.0006)	(0.0006)
BoardSize	−0.0003	−0.0002
	(0.0003)	(0.0003)
BoardIndep	−0.0001**	−0.0001*
	(0.0000)	(0.0000)
Firm Fixed Effects	YES	YES
Industry Fixed Effects	YES	YES
Observations	18,961	18,951
R^2	0.1900	0.1910

5. Conclusion

This study provides comprehensive evidence that corporate greenwashing and earnings management are complementary forms of strategic corporate behavior. Across multiple model specifications, endogeneity corrections, and robustness checks, I consistently find that firms with higher greenwashing intensity exhibit significantly higher levels of discretionary accruals. This relationship is robust to the choice of accrual estimation model, temporal ordering, and instrumental variable approaches.

This study makes three distinct contributions. First, it extends the greenwashing literature by establishing a direct, robust link between symbolic environmental disclosure and accrual-based earnings management among U.S. listed firms. While prior research has documented greenwashing as an impression management strategy in the non-financial domain (Kim and Lyon, 2015; Marquis *et al.*, 2016), this study demonstrates that such behavior systematically extends into financial reporting, suggesting that greenwashing signals a broader opportunistic reporting orientation within the firm. Second, it contributes to the earnings management literature by identifying greenwashing intensity as a significant predictor of discretionary accruals, offering incremental explanatory power beyond traditional firm-level determinants such as size, leverage, and profitability. Third, the moderation analyses provide nuanced insights into the institutional limits of conventional governance mechanisms. Specifically, the unexpected strengthening effect of Big 4 audit quality on the greenwashing-earnings management nexus challenges the assumption that high-quality external monitoring uniformly constrains dual-domain impression management, while the board diversity results highlight the complexity of detecting coordinated misrepresentation across reporting domains. Collectively, these findings inform regulators, investors, and standard setters that environmental disclosure integrity and financial reporting quality are interdependent strategic arenas, and that improving transparency in one domain cannot be assumed to automatically discipline behavior in the other.

This study has important implications for regulators, investors, and corporate governance practitioners. Regulators should recognize that greenwashing is not an isolated communication problem but may be indicative of broader reporting integrity issues. Enhanced scrutiny of firms with high greenwashing scores, particularly in the context of financial reporting, may be warranted. Investors should incorporate greenwashing metrics into their assessment of earnings quality, as my results suggest that greenwashing firms are more likely to engage in accrual manipulation.

Corporate boards should be aware that greenwashing may signal a culture of opportunistic reporting that extends beyond environmental disclosures.

Several limitations of this study suggest avenues for future research. First, the greenwashing measure, while consistent with prior literature, captures only one dimension of environmental misrepresentation. Future research could explore alternative measures based on textual analysis of sustainability reports or third-party environmental ratings. Second, this study's sample is limited to publicly listed firms with sufficient data for accrual estimation, which may not generalize to private firms or smaller public companies. Third, while the endogeneity corrections address many concerns, the possibility of remaining unobserved heterogeneity cannot be entirely ruled out. Future research could exploit quasi-experimental settings or regulatory changes to establish sharper causal identification.

In conclusion, this study establishes that greenwashing is not merely a public relations strategy but a signal of broader corporate reporting behavior. Firms that mislead stakeholders about their environmental performance are also more likely to manipulate their financial reports, underscoring the interconnected nature of corporate impression management across reporting domains. As stakeholders continue to demand greater transparency in both environmental and financial reporting, understanding these interconnections becomes increasingly critical for ensuring the integrity of corporate communication.

Chapter Four: Summary of Hypotheses and Discussion

1. Overview

This thesis comprises two empirical essays examining the intersection of corporate greenwashing and financial reporting quality. Essay One investigates the association between conditional accounting conservatism and greenwashing; Essay Two examines the relationship between earnings management and greenwashing, including the moderating roles of audit quality and board diversity. Both essays are unified by institutional theory and impression management theory and by a common research question: whether environmental impression management coexists with, or is constrained by, core attributes of financial reporting quality. This chapter summarizes the hypotheses tested in both essays, evaluates their collective support, and offers a cross-essay discussion of the findings. Rather than repeating conclusions already presented in Chapters Two and Three, the discussion focuses on thematic integration and implications that emerge only when the two essays are considered jointly.

2. Summary of Hypotheses

Essay One: Conditional Accounting Conservatism and Corporate Greenwashing

Hypothesis	Statement	Status
H1	Corporate greenwashing is positively associated with conditional accounting conservatism, such that firms exhibiting higher greenwashing intensity are associated with higher C-scores.	Supported

Essay Two: Earnings Management and Corporate Greenwashing

Hypothesis	Statement	Status
H1	Greenwashing is positively associated with earnings management.	Supported
H2	Big 4 audit quality negatively moderates the relationship between greenwashing and earnings management, such that the positive association is weaker for firms audited by Big 4 auditors.	Not supported (opposite effect found)
H3	Board diversity negatively moderates the relationship between greenwashing and earnings management, such that the positive association is weaker in firms with more diverse boards.	Partially supported (main effect negative, interaction positive)

3. Cross-Essay Thematic Discussion

3.1 Complementarity Between Greenwashing and Financial Reporting Attributes

A consistent pattern across both essays is that greenwashing coexists with, rather than substitutes for, financial reporting attributes conventionally associated with reporting discipline. Essay One shows that firms with higher conditional conservatism, ordinarily interpreted as a constraint on managerial opportunism, also exhibit higher greenwashing intensity. Essay Two shows that firms with higher greenwashing intensity exhibit higher discretionary accruals, a direct indicator of earnings manipulation. Read together, these results suggest that conservative accounting and unconstrained accrual choices operate as separate margins of managerial discretion rather than a single, unified reporting stance. Firms appear to satisfy creditor and auditor demands for conservative accounting while retaining discretion over accruals and directing impression management toward the comparatively unregulated environmental disclosure domain.

3.2 Institutional Decoupling as an Integrating Framework

Both essays draw on institutional theory, and specifically the concept of decoupling (Bromley and Powell, 2012; Meyer and Rowan, 1977), to explain why tightly regulated financial reporting can coexist with loosely regulated environmental disclosure. Essay One develops this argument most directly, showing that firms embedded in a tightly coupled financial reporting field can simultaneously engage in loosely coupled, symbolic behavior in the environmental domain. This framework also helps interpret the moderation results in Essay Two. If greenwashing and earnings management were both purely opportunistic, stronger external monitoring, such as Big 4 auditing, might be expected to reduce both. Instead, Big 4 audit quality strengthens the association between greenwashing and earnings management, suggesting that the intensive scrutiny applied to financial statements does not extend with comparable rigor to sustainability disclosures. The decoupling observed across the two essays therefore reflects differences in monitoring intensity across reporting domains rather than a general absence of governance.

3.3 The Domain-Contingent Nature of Governance Mechanisms

The moderation results in Essay Two indicate that governance mechanisms conventionally treated as universal constraints on managerial opportunism, namely audit quality and board composition,

operate differently depending on the reporting domain. Big 4 auditors appear effective at constraining certain forms of financial misstatement but do not reduce the joint use of greenwashing and earnings management; the interaction effect identified in Essay Two runs in the opposite direction. Board diversity shows a related pattern: it is associated with lower earnings management on average, yet its interaction with greenwashing is positive, indicating a more limited capacity to detect misrepresentation that spans both financial and non-financial domains. These results suggest that regulatory efforts to tighten environmental disclosure standards, including the U.S. Securities and Exchange Commission's climate disclosure rule and the International Sustainability Standards Board's IFRS S1 and S2 standards, may not eliminate impression management so much as displace it toward reporting channels that remain less closely monitored.

3.4 Theoretical Integration: Institutional Theory and Impression Management Theory

The two essays are unified by the same pair of theoretical lenses. Institutional theory explains the structural conditions that permit greenwashing to coexist with disciplined financial reporting: financial disclosure operates under coercive and normative pressures that produce tight institutional coupling, whereas environmental disclosure remains loosely coupled and governed by fragmented, largely voluntary standards (DiMaggio and Powell, 1983; Meyer and Rowan, 1977; Scott, 1995). Impression management theory explains the managerial motivation underlying this pattern: when one channel for shaping stakeholder perceptions is constrained by strong verification standards, managers redirect their efforts toward channels with weaker institutional controls (Goffman, 2023; Hooghiemstra, 2000). Applied jointly across both essays, this framework indicates that conservatism and earnings management, though differing in their governance implications, share a common relationship with greenwashing. Each reflects the boundary of what financial reporting discipline can constrain, and greenwashing represents the redirection of impression management beyond that boundary, into a domain where verification remains comparatively weak.

3.5 Limitations and Future Research Directions

Several limitations apply across both essays. First, the GW-score captures the overall divergence between disclosure and performance but does not distinguish among specific forms of

greenwashing, such as selective disclosure, exaggerated claims, or omission of unfavorable information; textual analysis of sustainability reports could help decompose this measure in future work. Second, both essays are based on U.S. listed firms operating under strong financial reporting regulation and comparatively weak sustainability disclosure mandates; extending the analysis to jurisdictions with mandatory sustainability reporting, such as the European Union under the Corporate Sustainability Reporting Directive, would help establish the generalizability of the findings. Third, although both essays employ multiple endogeneity corrections, including lagged specifications, instrumental variable estimation, and propensity score matching, these approaches cannot fully rule out unobserved heterogeneity. Future research could exploit regulatory shocks, such as new climate disclosure rules, as quasi-experimental settings to strengthen causal identification.

4. Concluding Reflections

Taken together, the two essays suggest that corporate reporting behavior is more strategically differentiated than conventional governance frameworks assume. Firms do not choose uniformly between transparency and opacity; instead, they respond to institutional pressures and verification standards that vary by disclosure domain, applying discipline where monitoring is strong and retaining discretion where it is weak. The positive associations between greenwashing and both conservatism and earnings management reflect this differentiated response rather than a single, uniform reporting orientation.

These findings carry several implications. For regulators, harmonizing sustainability disclosure standards is a necessary but likely insufficient step, since firms may redirect impression management toward channels that remain outside the scope of new rules. For investors and analysts, greenwashing indicators may usefully complement earnings quality assessments rather than being treated as a separate, unrelated dimension of firm behavior. For researchers, the results support treating financial and non-financial reporting as interdependent strategic domains rather than as separate literatures, and this thesis is intended as a contribution toward that integration.

References

Adams, R. B., & Ferreira, D. (2009). Women in the boardroom and their impact on governance and performance. *Journal of Financial Economics*, 94(2), 291-309. https://doi.org/10.1016/j.jfineco.2008.10.007

Ahmed, A. S., Billings, B. K., Morton, R. M., & Stanford-Harris, M. (2002). The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *The Accounting Review*, 77(4), 867-890. https://doi.org/10.2308/accr.2002.77.4.867

Ahrens, F. K., Veltrop, D. B., Mulder, L. B., & Rink, F. (2026). Board size in context: A meta-analysis on the relationship between board size and firm performance. *Corporate Governance: An International Review*, *34*(2), 290-309. https://doi.org/10.1111/corg.12664

Alsaeed, K. (2006). The association between firm-specific characteristics and disclosure: The case of Saudi Arabia. *Managerial Auditing Journal*, 21(5), 476–496. https://doi.org/10.1108/02686900610667256

Al-Shaer, H. (2020). Sustainability reporting quality and post-audit financial reporting quality: Empirical evidence from the UK. *Business strategy and the Environment*, *29*(6), 2355-2373. https://doi.org/10.1002/bse.2507

Anagnostopoulou, S. C., Tsekrekos, A. E., & Voulgaris, G. (2021). Accounting conservatism and corporate social responsibility. *The British Accounting Review*, *53*(4), 100942. https://doi.org/10.1016/j.bar.2020.100942

Aobdia, D., Li, Q., Na, K., & Wu, H. (2024). The influence of labor market power in the audit profession. *The Accounting Review*, *99*(5), 65-95. https://doi.org/10.2308/TAR-2020-0782

Arun, T. G., Almahrog, Y. E., & Aribi, Z. A. (2015). Female directors and earnings management: Evidence from UK companies. *International Review of Financial Analysis*, *39*, 137-146. https://doi.org/10.1016/j.irfa.2015.03.002

Avramov, D., Cheng, S., Lioui, A., & Tarelli, A. (2022). Sustainable investing with ESG rating uncertainty. *Journal of Financial Economics*, 145(2), 642-664. https://doi.org/10.1016/j.jfineco.2021.09.009

Backof, A. G., Bamber, E. M., & Carpenter, T. D. (2016). Do auditor judgment frameworks help in constraining aggressive reporting? Evidence under more precise and less precise accounting standards. *Accounting, Organizations and Society*, *51*, 1-11. https://doi.org/10.1016/j.aos.2016.03.004

Badia, M., Duro, M., Penalva, F., & Ryan, S. G. (2021). Debiasing the measurement of conditional conservatism. *Journal of Accounting Research*, *59*(4), 1221-1259. https://doi.org/10.1111/1475-679X.12366

Baker, A. C., Larcker, D. F., McClure, C. G., Saraph, D., & Watts, E. M. (2024). Diversity washing. *Journal of Accounting Research*, *62*(5), 1661-1709. https://doi.org/10.1111/1475-679X.12542

Ball, R., & Shivakumar, L. (2005). Earnings quality in UK private firms: Comparative loss recognition timeliness. *Journal of Accounting and Economics*, 39(1), 83-128. https://doi.org/10.1016/j.jacceco.2004.04.001

Ball, R., Kothari, S. P., & Nikolaev, V. (2008). Econometrics of the Basu asymmetric timeliness coefficient and accounting conservatism. *Journal of Accounting Research*, 51(5), 1071-1097. https://doi.org/10.1111/1475-679X.12026

Baloria, V. P. (2022). Political connections and accounting conservatism. *The Accounting Review*, 97(6), 45-66. https://doi.org/10.2308/TAR-2015-0263

Basu, S. (1997). The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics*, 24(1), 3-37. https://doi.org/10.1016/S0165-4101(97)00014-1

Bates, T. W., Kahle, K. M., & Stulz, R. M. (2009). Why do U.S. firms hold so much more cash than they used to? *The Journal of Finance*, 64(5), 1985-2021. https://doi.org/10.1111/j.1540-6261.2009.01492.x

Beaver, W. H., & Ryan, S. G. (2000). Biases and lags in book value and their effects on the ability of the book-to-market ratio to predict book return on equity. *Journal of Accounting Research*, 38(1), 127-148. https://doi.org/10.2307/2672925

Becker, C. L., DeFond, M. L., Jiambalvo, J., & Subramanyam, K. R. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research*, 15(1), 1-24. https://doi.org/10.1111/j.1911-3846.1998.tb00547.x

Berg, F., Koelbel, J. F., & Rigobon, R. (2022). Aggregate confusion: The divergence of ESG ratings. *Review of Finance*, 26(6), 1315-1344. https://doi.org/10.1093/rof/rfac033

Berkin, A., Aerts, W., Roszkowska-Menkes, M., & Van Caneghem, T. (2025). CEO talk under scrutiny: visibility and rhetorical impression management in sustainability narratives. *Accounting, Auditing & Accountability Journal*, *38*(8), 1949-1978. https://doi.org/10.1108/AAAJ-08-2024-7297

Birindelli, G., Chiappini, H., & Jalal, R. N. U. D. (2024). Greenwashing, bank financial performance and the moderating role of gender diversity. *Research in International Business and Finance*, *69*, 102235. https://doi.org/10.1016/j.ribaf.2024.102235

Black, D. E., Pierce, S. R., & Thomas, W. B. (2022). A test of income smoothing using pseudo fiscal years. *Management Science*, *68*(7), 5533-5555. https://doi.org/10.1287/mnsc.2021.4158

Bochkay, K., Hales, J., & Serafeim, G. (2025). Disclosure standards and communication norms: evidence of voluntary sustainability standards as a coordinating device for capital markets. *Review of Accounting Studies*, *30*(3), 3021-3064. https://doi.org/10.1007/s11142-025-09882-8

Bolton, P., & Kacperczyk, M. (2021). Do investors care about carbon risk?. *Journal of financial economics*, *142*(2), 517-549. https://doi.org/10.1016/j.jfineco.2021.05.008

Bothello, J., Ioannou, I., Porumb, V. A., & Zengin-Karaibrahimoglu, Y. (2023). CSR decoupling within business groups and the risk of perceived greenwashing. *Strategic Management Journal*, *44*(13), 3217-3251. https://doi.org/10.1002/smj.3532

Bowen, F. (2014). After greenwashing: Symbolic corporate environmentalism and society. *Cambridge University Press*. https://doi.org/10.1017/CBO9781139541213

Bromley, P., & Powell, W. W. (2012). From smoke and mirrors to walking the talk: Decoupling in the contemporary world. *The Academy of Management Annals*, 6(1), 483-530. https://doi.org/10.5465/19416520.2012.684462

Burgstahler, D., & Dichev, I. (1997). Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*, 24(1), 99-126. https://doi.org/10.1016/S0165-4101(97)00017-7

Burke, Q. L., Chen, P. C., & Lobo, G. J. (2020). Is corporate social responsibility performance related to conditional accounting conservatism? *Accounting Horizons*, 34(2), 19–40. https://doi.org/10.2308/horizons-18-111

Cade, N. L., Gunn, J. L., & Vandenberg, A. J. (2025). Measuring the prevalence of earnings manipulations: A novel approach. *Journal of Accounting Research*, *63*(1), 113-164. https://doi.org/10.1111/1475-679X.12578

Cahan, S. F., Che, L., Knechel, W. R., & Svanström, T. (2022). Do audit teams affect audit production and quality? Evidence from audit teams' industry knowledge. *Contemporary Accounting Research*, *39*(4), 2657-2695. https://doi.org/10.1111/1911-3846.12807

Carter, D. A., Simkins, B. J., & Simpson, W. G. (2010). Corporate governance, board diversity, and firm value. *Financial Review*, 45(4), 615-631. https://doi.org/10.1111/1540-6288.00034

Cepêda, C., Monteiro, A. P., & Aibar-Guzmán, B. (2025). Decoupling in sustainability reporting: a systematic literature review. *Corporate Social Responsibility and Environmental Management*, *32*(3), 2988-3007. https://doi.org/10.1002/csr.3114

Chatterjee, R., & Rakshit, D. (2023). Association between earnings management and corporate governance mechanisms: A study based on select firms in India. *Global Business Review*, *24*(1), 152-170. https://doi.org/10.1177/0972150919885545

Che, L., Hope, O. K., & Langli, J. C. (2020). How big-4 firms improve audit quality. *Management Science*, *66*(10), 4552-4572. https://doi.org/10.1287/mnsc.2019.3370

Chen, E., Gavious, I., & Lev, B. (2017). The positive externalities of IFRS R&D capitalization: enhanced voluntary disclosure. *Review of Accounting Studies*, *22*(2), 677-714. https://doi.org/10.1007/s11142-017-9399-x

Chen, M., Ren, J., & Zhao, J. (2024). The impact of corporate culture on stock price crash risk: A firm-level analysis. *International Journal of Accounting & Information Management*, 32(1), pp.1-18. https://doi.org/10.1108/IJAIM-04-2023-0095

Chen, X., Cheng, Q., & Wang, X. (2015). Does increased board independence reduce earnings management? Evidence from recent regulatory reforms. *Review of Accounting Studies*, *20*(2), 899-933. https://doi.org/10.1007/s11142-015-9316-0

Cho, C. H., & Patten, D. M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, 32(7-8), 639-647. https://doi.org/10.1016/j.aos.2006.09.009

Cho, C. H., Laine, M., Roberts, R. W., & Rodrigue, M. (2015). Organized hypocrisy, organizational façades, and sustainability reporting. *Accounting, Organizations and Society*, 40, 78-94. https://doi.org/10.1016/j.aos.2014.12.003

Choi, S., Ferri, F., & Macciocchi, D. (2026). Do mutual funds respond to mechanical changes in esg ratings?. *Management Science*. https://doi.org/10.1287/mnsc.2024.06184

Christensen, D. M., Serafeim, G., & Sikochi, A. (2022). Why is corporate virtue in the eye of the beholder? The case of ESG ratings. *The Accounting Review*, *97*(1), 147-175. https://doi.org/10.2308/TAR-2019-0506

Christensen, H. B., Hail, L., & Leuz, C. (2021). Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies*, 26(3), 1176-1248. https://doi.org/10.1007/s11142-021-09609-5

Chy, M., & Hope, O. K. (2021). Real effects of auditor conservatism. *Review of Accounting Studies*, *26*(2), 730-771. https://doi.org/10.1007/s11142-020-09568-3

Clarkson, P. M., Li, Y., Richardson, G. D., & Vasvari, F. P. (2008). Revisiting the relation between environmental performance and environmental disclosure: An empirical analysis. *Accounting, Organizations and Society*, 33(4-5), 303-327. https://doi.org/10.1016/j.aos.2007.05.003

Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *The Accounting Review*, 83(3), 757-787. https://doi.org/10.2308/accr.2008.83.3.757

Coles, J. L., Daniel, N. D., & Naveen, L. (2008). Boards: Does one size fit all? *Journal of Financial Economics*, 87(2), 329-356. https://doi.org/10.1016/j.jfineco.2006.08.008

Correia, S. (2017). reghdfe: Stata module for linear and instrumental-variable/GMM regression absorbing multiple levels of fixed effects. Statistical Software Components, Boston College Department of Economics.

Cui, X., Li, R., Xue, S., & Zhang, X. (2025). Mandatory versus voluntary: The real effect of ESG disclosures on corporate earnings management. *Journal of International Money and Finance*, *154*, 103323. https://doi.org/10.1016/j.jimonfin.2025.103323

Daryaei, A. A., Fattahi, Y., & Aldbs, A. (2024). The puzzling association between accounting conservatism and corporate social responsibility. *Asian Journal of Accounting Research*, *9*(1), 35-46. https://doi.org/10.1108/AJAR-01-2023-0010

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics*, 3(3), 183-199. https://doi.org/10.1016/0165-4101(81)90002-1

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 35–59. https://doi.org/10.2308/accr.2002.77.s-1.35

Dechow, P. M., Larson, C. R., & Resutek, R. J. (2022). The effect of accrual heterogeneity on accrual quality inferences. *The Accounting Review*, *97*(5), 245-273. https://doi.org/10.2308/TAR-2019-0200

Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics*, 18(1), 3-42. https://doi.org/10.1016/0165-4101(94)90016-7

Dechow, P. M., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons*, 14(2), 235-250. https://doi.org/10.2308/acch.2000.14.2.235

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, 70(2), 193-225. https://www.jstor.org/stable/248303

DeFond, M. L., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics*, 17(1-2), 145-176. https://doi.org/10.1016/0165-4101(94)90008-6

DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics*, 58(2-3), 275-326. https://doi.org/10.1016/j.jacceco.2014.09.002

DeGeorge, F., Patel, J., & Zeckhauser, R. (1999). Earnings management to exceed thresholds. *The Journal of Business*, 72(1), 1-33. https://doi.org/10.1086/209601

Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64-87. https://doi.org/10.1525/cmr.2011.54.1.64

Demaline, C. (2020). Disclosure readability of firms investigated for books-and-records infractions: An impression management perspective. *Journal of Financial Reporting and Accounting*, *18*(1), 131-145. https://doi.org/10.1108/JFRA-10-2018-0094

Demerjian, P., Donovan, J., & Lewis-Western, M. F. (2020). Income smoothing and the usefulness of earnings for monitoring in debt contracting. *Contemporary Accounting Research*, *37*(2), 857-884. https://doi.org/10.1111/1911-3846.12544

Denis, D. J., & Wang, L. (2024). Corporate cash holdings. *Handbook of corporate finance*, 223-248. https://doi.org/10.4337/9781800373891.00012

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160. https://doi.org/10.2307/2095101

Duchin, R., Gao, J., & Xu, Q. (2025). Sustainability or greenwashing: Evidence from the asset market for industrial pollution. *The Journal of Finance*, *80*(2), 699-754. https://doi.org/10.1111/jofi.13412

Dunne, N. J., Brennan, N. M., & Kirwan, C. E. (2021). Impression management and Big Four auditors: Scrutiny at a public inquiry. *Accounting, Organizations and Society*, *88*, 101170. https://doi.org/10.1016/j.aos.2020.101170

Dyreng, S. D., Hillegeist, S. A., & Penalva, F. (2022). Earnings management to avoid debt covenant violations and future performance. *European Accounting Review*, *31*(2), 311-343. https://doi.org/10.1080/09638180.2020.1826337

Eccles, R. G., Ioannou, I., & Serafeim, G. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science*, 60(11), 2835-2857. https://doi.org/10.1287/mnsc.2014.1984

Fama, E. F., & French, K. R. (2004). New lists: Fundamentals and survival rates. *Journal of Financial Economics*, 73(2), 229-269. https://doi.org/10.1016/j.jfineco.2003.04.001

Fiechter, P., Hitz, J. M., & Lehmann, N. (2022). Real effects of a widespread CSR reporting mandate: Evidence from the European Union's CSR Directive. *Journal of Accounting Research*, *60*(4), 1499-1549. https://doi.org/10.1111/1475-679X.12424

Francis, J. R., & Krishnan, J. (1999). Accounting accruals and auditor reporting conservatism. *Contemporary Accounting Research*, 16(1), 135-165. https://doi.org/10.1111/j.1911-3846.1999.tb00577.x

Francis, J. R. (2004). What do we know about audit quality? *The British Accounting Review*, 36(4), 345-368. https://doi.org/10.1016/j.bar.2004.09.003

Francis, J., & Martin, X. (2010). Acquisition profitability and timely loss recognition. *Journal of Financial Economics*, 96(3), 373-387. https://doi.org/10.1016/j.jacceco.2009.09.003

Frankel, R., Kothari, S. P., & Raghunandan, A. (2025). The economics of ESG disclosure regulation. *Review of Accounting Studies*, 1-36. https://doi.org/10.1007/s11142-025-09900-9

Franz, D. R., HassabElnaby, H. R., & Lobo, G. J. (2014). Impact of proximity to debt covenant violation on earnings management. *Review of Accounting Studies*, *19*(1), 473-505. https://doi.org/10.1007/s11142-013-9252-9

Garcia Lara, J. M., Garcia Osma, B., & Penalva, F. (2016). Accounting conservatism and firm investment efficiency. *Journal of Accounting and Economics*, 61(1), 221-238. https://doi.org/10.1016/j.jacceco.2015.07.003

Garcia Lara, J. M., Garcia Osma, B., & Penalva, F. (2020). Conditional conservatism and the limits to earnings management. *Journal of Accounting and Public Policy*, 69(1), 1-26. https://doi.org/10.1016/j.jaccpubpol.2020.106738

Genin, A., Ma, W., Bhagwat, V., & Bernile, G. (2023). Board experiential diversity and corporate radical innovation. *Strategic Management Journal*, *44*(11), 2634-2657. https://doi.org/10.1002/smj.3499

Gerged, A. M., Albitar, K., & Al-Haddad, L. (2023). Corporate environmental disclosure and earnings management—The moderating role of corporate governance structures.

International Journal of Finance & Economics, 28(3), 2789–2810. https://doi.org/10.1002/ijfe.2564

Goffman, E. (2023). The presentation of self in everyday life. In *Social theory re-wired* (pp. 450-459).

Gow, I. D., Larcker, D. F., & Watts, E. M. (2023). Board diversity and shareholder voting. *Journal of Corporate Finance*, 83, 102487. https://doi.org/10.1016/j.jcorpfin.2023.102487

Grieser, W., Hadlock, C. J., & Pierce, J. R. (2021). Doing good when doing well: Evidence on real earnings management. *Review of Accounting Studies*, 26(3), 906–932. https://doi.org/10.1007/s11142-021-09610-y

Griffin, D., Li, K., & Xu, T. (2021). Board gender diversity and corporate innovation: International evidence. *Journal of Financial and Quantitative Analysis*, *56*(1), 123-154. https://doi.org/10.1017/S002210901900098X

Gul, F. A., Chen, C. J., & Tsui, J. S. (2003). Discretionary accounting accruals, managers' incentives, and audit fees. *Contemporary Accounting Research*, 20(3), 441–464. https://doi.org/10.1506/686E-NF2J-73X6-G540

Gul, F. A., Fung, S. Y. K., & Jaggi, B. (2009). Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. Journal of Accounting and Economics, 47(3), 265–287. https://doi.org/10.1016/j.jacceco.2009.03.001

Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*, 59, 5-21. https://doi.org/10.1016/j.jclepro.2013.07.005

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365-383. https://doi.org/10.2308/acch.1999.13.4.365

Hillman, A. J., & Dalziel, T. (2003). Boards of directors and firm performance: Integrating agency and resource dependence perspectives. *Academy of Management Review*, 28(3), 383–396. https://doi.org/10.2307/30040728

Hooghiemstra, R. (2000). Corporate communication and impression management—New perspectives why companies engage in corporate social reporting. *Journal of Business Ethics*, 27(1-2), 55-68. https://doi.org/10.1023/A:1006400707757

Hrazdil, K., Simunic, D. A., Spector, S., & Suwanyangyuan, N. (2023). Top executive gender diversity and financial reporting quality. *Journal of Contemporary Accounting & Economics*, *19*(2), 100363. https://doi.org/10.1016/j.jcae.2023.100363

Huang, J., & Lu, S. (2025). Gender diversity performance and voluntary disclosure: Mind the (gender pay) gap. *Accounting, Organizations and Society*, 114, 101594. https://doi.org/10.1016/j.aos.2025.101594

Huang, R., Xie, X., & Zhou, H. (2022). 'Isomorphic'behavior of corporate greenwashing. *Chinese Journal of Population, Resources and Environment*, *20*(1), 29-39. https://doi.org/10.1016/j.cjpre.2022.03.004

Inderst, R., & Opp, M. M. (2025). Sustainable finance versus environmental policy: Does greenwashing justify a taxonomy for sustainable investments? *Journal of Financial Economics*, 163, 103954. https://doi.org/10.1016/j.jfineco.2024.103954

Janik, A., & Ryszko, A. (2026). Greenwashing in Sustainability Reporting: A Systematic Literature Review of Strategic Typologies and Content-Analysis-Based Measurement Approaches. *Sustainability*, *18*(1), 17. https://doi.org/10.3390/su18010017

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Johnson, V. E., Khurana, I. K., & Reynolds, J. K. (2002). Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research*, 19(4), 637–660. https://doi.org/10.1506/LLTH-JXQV-8CEW-8MXD

Jones, J. J. (1991). Earnings management during import relief investigations. *Journal of Accounting Research*, 29(2), 193-228. https://doi.org/10.2307/2491047

Khalifa, M., Zouaoui, H., Ben Othman, H., & Hussainey, K. (2024). The impact of climate risk on accounting conservatism: evidence from developing countries. *Journal of applied accounting research*, *25*(3), 570-593. https://doi.org/10.1108/JAAR-01-2023-0028

Khan, S., Kamal, Y., Abbas, M., & Hussain, S. (2022). Board of directors and earnings manipulation: Evidence from regulatory change. Future Business Journal, 8, Article 63. https://doi.org/10.1186/s43093-022-00173-1

Khan, M., & Watts, R. L. (2009). Estimation and empirical properties of a firm-year measure of accounting conservatism. *Journal of Accounting and Economics*, 48(2-3), 132-150. https://doi.org/10.1016/j.jacceco.2009.08.002

Kim, E. H., & Lyon, T. P. (2015). Greenwash vs. brownwash: Exaggeration and undue modesty in corporate sustainability disclosure. *Organization Science*, 26(3), 705-723. https://doi.org/10.1287/orsc.2014.0949

Kim, Y., Park, M. S., & Wier, B. (2012). Is earnings quality associated with corporate social responsibility? *The Accounting Review*, 87(3), 761–796. https://doi.org/10.2308/accr-10209

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3), 375-400. https://doi.org/10.1016/S0165-4101(02)00059-9

Koch, C., & Salterio, S. E. (2017). The effects of auditor affinity for client and perceived client pressure on auditor proposed adjustments. *The Accounting Review*, 92(5), 117–142. https://doi.org/10.2308/accr-51703

Kolk, A. and Perego, P. (2010). Determinants of the adoption of sustainability assurance statements: An international investigation. *Business Strategy and the Environment*, 19(3), 182-198. https://doi.org/10.1002/bse.643

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, 39(1), 163-197. https://doi.org/10.1016/j.jacceco.2004.11.002

Krishnan, G. V., & Parsons, L. M. (2008). Getting to the bottom line: An exploration of gender and earnings quality. *Journal of Business Ethics*, *78*(1), 65-76. https://doi.org/10.1007/s10551-006-9314-z

Kronenberger, S., & Laux, V. (2022). Conservative accounting, audit quality, and litigation. *Management Science*, 68(3), 2349–2362. https://doi.org/10.1287/mnsc.2021.3971

Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics*, 115(2), 304-329. https://doi.org/10.1016/j.jfineco.2014.09.008

Krueger, P., Sautner, Z., Tang, D., & Zhong, R. (2024). The effects of mandatory ESG disclosure around the world. *Journal of Accounting Research*, 62(5), 1795-1847. https://doi.org/10.1111/1475-679X.12548

LaFond, R., & Roychowdhury, S. (2008). Managerial ownership and accounting conservatism. *Journal of Accounting Research*, 46(1), 101–135. https://doi.org/10.1111/j.1475-679X.2008.00268.x

LaFond, R., & Watts, R. L. (2008). The information role of conservatism. *The Accounting Review*, 83(2), 447–478. https://doi.org/10.2308/accr.2008.83.2.447

Lamoreaux, P. T., Mowchan, M., & Zhang, W. (2023). Does Public Company Accounting Oversight Board regulatory enforcement deter low-quality audits? *The Accounting Review*, 98(3), 335–366. https://doi.org/10.2308/TAR-2020-0658

Laufer, W. S. (2003). Social accountability and corporate greenwashing. *Journal of Business Ethics*, 43(3), 253-261. https://doi.org/10.1023/A:1022962719299

Le, Q., Vafaei, A., Ahmed, K., & Kutubi, S. (2023). Busy boards and accounting conservatism–an Australian perspective. *Meditari Accountancy Research*, *31*(4), 970-1014. https://doi.org/10.1108/MEDAR-10-2021-1466

Lee, M. T., & Raschke, R. L. (2023). Stakeholder legitimacy in firm greening and financial performance: What about greenwashing temptations? *Journal of Business Research*, 155, Article 113393. https://doi.org/10.1016/j.jbusres.2022.113393

Lennox, C. S., & Pittman, J. A. (2010). Big five audits and accounting fraud. *Contemporary Accounting Research*, 27(1), 209-247. https://doi.org/10.1111/j.1911-3846.2010.01007.x

Li, K., et al. (2024). The effect of CEO's compensation in driving corporate ESG greenwashing: Evidence from China. *PLOS ONE*, 19(10), e0312247. https://doi.org/10.1371/journal.pone.0312247

Lin, Y., Shen, R., Wang, J., & Yu, J. Y. (2024). Global evolution of environmental and social disclosure in annual reports. *Journal of Accounting Research*, 62(5), 1941–1988. https://doi.org/10.1111/1475-679X.12575

Linck, J. S., Netter, J. M., & Yang, T. (2008). The determinants of board structure. *Journal of Financial Economics*, 87(2), 308–328. https://doi.org/10.1016/j.jfineco.2007.03.004

Lu, J., Rong, D., Eweje, G., Yuan, X., Song, M., & Searcy, C. (2025). Effective environmental strategy or illusory tactics? Corporate greenwashing and innovation willingness. *Business Strategy and the Environment*, 34(1), 1338–1356. https://doi.org/10.1002/bse.4047

Lyon, T. P., & Maxwell, J. W. (2011). Greenwash: Corporate environmental disclosure under threat of audit. *Journal of Economics & Management Strategy*, 20(1), 3–41. https://doi.org/10.1111/j.1530-9134.2010.00282.x

Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, 28(2), 223–249. https://doi.org/10.1177/1086026615575332

Mahoney, L. S., Thorne, L., Cecil, L., & LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Critical Perspectives on Accounting*, *24*(4–5), 350–359. https://doi.org/10.1016/j.cpa.2012.09.008

Mao, Z., Wang, S., & Lin, Y. E. (2024). ESG, ESG rating divergence and earnings management: Evidence from China. *Corporate Social Responsibility and Environmental Management*, *31*(4), 3328-3347. https://doi.org/10.1002/csr.2748

Marquis, C., Toffel, M. W., & Zhou, Y. (2016). Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organization Science*, 27(2), 483-504. https://doi.org/10.1287/orsc.2015.1039

Mayberry, M. A., Park, H. J., & Zhang, W. (2024). Relative liability exposure for negligence and financial reporting quality: Evidence from the audit interference rule. *The Accounting* Review, 99(4), 339–366. https://doi.org/10.2308/TAR-2021-0757

Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340-363. https://doi.org/10.1086/226550

Mohapatra, S., Kumar, A., Mohapatra, M. R., & Srivastava, V. (2025). Does CEO duality moderate environmental, social, and governance performance-earnings management relationship? Evidence from emerging markets. *Finance Research Letters*, 73, 106616. https://doi.org/10.1016/j.frl.2024.106616

Nguyen, Q., Kim, M. H., & Ali, S. (2024). Corporate governance and earnings management: Evidence from Vietnamese listed firms. *International Review of Economics & Finance*, 89, 775–801. https://doi.org/10.1016/j.iref.2023.07.084

Pincus, M., Wu, S., & Hwang, J. (2022). Did accrual earnings management decline and real earnings management increase post-SOX? A re-examination over an extended post-SOX period and a closer look at REM-AEM substitution. *Journal of Financial Reporting*, 7(2), 179–205. https://doi.org/10.2308/JFR-2019-0009

Prior, D., Surroca, J., & Tribó, J. A. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate governance: An international review*, *16*(3), 160-177. https://doi.org/10.1111/j.1467-8683.2008.00678.x

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, 22(1), 435-480. https://doi.org/10.1093/rfs/hhn053

Rajgopal, S., Srinivasan, S., & Zheng, X. (2021). Measuring audit quality. *Review of Accounting Studies*, 26(2), 559–619. https://doi.org/10.1007/s11142-020-09570-9

Schlenker, B. R. (1980). *Impression management* (Vol. 526). Monterey, CA: Brooks/Cole.

Scott, W. R. (1995). *Institutions and Organizations*, Sage.

Siddique, M. A., Karim, S., Haque, M. R., & Mia, P. (2026). The truth behind sustainability claims: Examining carbon risk, ESG disclosures, and greenwashing. *International Review of Financial Analysis*, 109, Article 104735. https://doi.org/10.1016/j.irfa.2025.104735

Skinner, D. J., & Sloan, R. G. (2002). Earnings surprises, growth expectations, and stock returns or don't let an earnings torpedo sink your portfolio. *Review of accounting studies*, *7*(2), 289-312. https://doi.org/10.1023/A:1020294523516

Sneideriene, A., & Legenzova, R. (2025). Uncovering greenwashing: Investigating impression management gap in corporate reporting. *Sustainability*, 17(18), 8342. https://doi.org/10.3390/su17188342

Stock, J. H., & Yogo, M. (2005). Testing for weak instruments in linear IV regression. In D. W. K. Andrews and J. H. Stock (Eds.), *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg* (pp. 80-108). Cambridge University Press, Cambridge. https://doi.org/10.1017/CBO9780511614491.006

Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571-610. https://doi.org/10.5465/amr.1995.9508080331

Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the long-run market performance of initial public offerings. *The Journal of Finance*, 53(6), 1935-1974. https://doi.org/10.1111/0022-1082.00079

Terza, J. V., Basu, A., & Rathouz, P. J. (2008). Two-stage residual inclusion estimation: Addressing endogeneity in health econometric modeling. *Journal of Health Economics*, 27(3), 531-543. https://doi.org/10.1016/j.jhealeco.2007.09.009

Viana, D. B. C., Jr., Lourenço, I., & Black, E. L. (2022). Financial distress, earnings management and Big 4 auditors in emerging markets. *Accounting Research Journal*, 35(5), 660–675. https://doi.org/10.1108/ARJ-06-2021-0165

Watts, R. L. (2003a). Conservatism in accounting part I: Explanations and implications. *Accounting Horizons*, 17(3), 207-221. https://doi.org/10.2308/acch.2003.17.3.207

Watts, R. L. (2003b). Conservatism in accounting part II: Evidence and research opportunities. *Accounting Horizons*, 17(4), 287-301. https://doi.org/10.2308/acch.2003.17.4.287

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data* (2nd ed.). MIT Press. https://mitpress.mit.edu/9780262232586/econometric-analysis-of-cross-section-and-panel-data/

Wooldridge, J. M. (2015). Control function methods in applied econometrics. *Journal of Human Resources*, 50(2), 420-445. https://doi.org/10.3368/jhr.50.2.420

Wukich, J. J., Neuman, E. L., & Fogarty, T. J. (2024). Show me? Inspire me? Make me? An institutional theory exploration of social and environmental reporting practices. *Journal of Accounting & Organizational Change*, 20(4), 673–701. https://doi.org/10.1108/JAOC-01-2023-0013

Xue, H. (2025). ESG disclosure, market forces, and investment efficiency. *The Accounting Review*, 100(5), 439–467. https://doi.org/10.2308/TAR-2023-0707

Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185-211. https://doi.org/10.1016/0304-405X(95)00844-5

Yin, H., Zhang, K., Song, S., & Chen, Z. (2025). Board independence, corporate social responsibility, and earnings management. *Finance Research Letters*, 108603. https://doi.org/10.1016/j.frl.2025.108603

Yu, D., Latif, B., Kumar, S., & Sharif, A. (2026). Regional Digitalization and Corporate Greenwashing: The Relevance of Information Disclosure Quality. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.70653

Zalata, A. M., Ntim, C. G., Alsohagy, M. H., & Malagila, J. (2022). Gender diversity and earnings management: The case of female directors with financial background. *Review of Quantitative Finance and Accounting*, 58(1), 101–136. https://doi.org/10.1007/s11156-021-00991-4

Essay 1 Appendix A: Variable Definitions

Variable	Definition
C-score	Firm-year-specific conditional conservatism measure developed by Khan and Watts (2009), estimated from annual cross-sectional regressions of earnings on returns interacted with firm characteristics. Higher values indicate greater asymmetric timeliness of loss recognition.
GW-score	Corporate greenwashing intensity score, constructed as the standardized divergence between environmental disclosure intensity and actual environmental performance metrics. Higher values indicate greater greenwashing intensity. Following Kim and Lyon (2015) and Marquis et al. (2016).
Basu Score	Firm-year asymmetric timeliness coefficient estimated from the Basu (1997) piecewise linear regression of earnings on stock returns.
CG-score	Net conservatism score, constructed as the Khan and Watts (2009) C-score minus the corresponding G-score (good-news timeliness).
Size	Natural logarithm of total assets (in millions of U.S. dollars), measured at fiscal year-end.
Leverage	Total debt scaled by total assets, measured as (short-term debt + long-term debt) / total assets.
ROA	Return on assets, computed as net income divided by average total assets.
Cash Holding	Cash and cash equivalents scaled by total assets.
Firm Age	Natural logarithm of one plus the number of years since the firm's initial public offering (or first appearance in Compustat if IPO date is unavailable).
Board Size	Number of directors serving on the board of directors during the fiscal year.
Board Independence	Proportion of independent non-executive directors on the board.
Big4	Indicator variable equal to one if the firm is audited by a Big 4 accounting firm (Deloitte, Ernst & Young, KPMG, or PricewaterhouseCoopers), and zero otherwise.

Essay 2 Appendix B: Variable Definitions

Variable	Definition
|DA|	Absolute value of discretionary accruals, estimated as the residual from either the modified Jones model (Dechow et al., 1995) or the performance-matched model (Kothari et al., 2005). Total accruals are computed as net income minus cash flow from operations, scaled by lagged total assets. The absolute value captures earnings management in either direction (income-increasing or income-decreasing).
GWScore	Corporate greenwashing intensity score, constructed as the standardized difference between environmental disclosure intensity and actual environmental performance metrics. Higher values indicate greater divergence between disclosed and actual environmental outcomes, reflecting more intensive greenwashing.
Size	Natural logarithm of total assets (in millions of U.S. dollars), measured at fiscal year-end.
Leverage	Total debt scaled by total assets, measured as (short-term debt + long-term debt) / total assets.
ROA	Return on assets, computed as net income divided by average total assets.
SalesGrowth	Percentage change in revenues from the prior fiscal year.
CFO	Cash flow from operations scaled by lagged total assets, measured as cash flow from operating activities divided by total assets at the beginning of the fiscal year.
Loss	Indicator variable equal to one if net income is negative in the current fiscal year, and zero otherwise.
LnAge	Natural logarithm of firm age, computed as the natural logarithm of one plus the number of years since the firm's initial public offering (or first appearance in Compustat if IPO date is unavailable).
Big4	Indicator variable equal to one if the firm is audited by a Big 4 accounting firm (Deloitte, Ernst & Young, KPMG, or PricewaterhouseCoopers) in the current fiscal year, and zero otherwise.
BoardSize	Number of directors serving on the board of directors during the fiscal year.
BoardIndep	Percentage of independent directors on the board, computed as the number of independent directors divided by total board members, multiplied by 100.
BoardDiversity	Percentage of female directors on the board of directors, computed as the number of female directors divided by total board members, multiplied by 100.
LagGWScore	One-year lagged value of GWScore, measured as the greenwashing intensity score from the prior fiscal year.
GWResidual	Residual from the first-stage regression of current GWScore on its two-period lagged values and all control variables in the two-stage residual inclusion (2SRI) control function approach.