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The Influence of ESG Scores & Metrics on Valuation Discounts and Premiums in
M&A

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Abstract (ENG)

The objective of this thesis was to determine how environmental, social, and governance (ESG) performance impacted mergers and acquisitions M&A premiums. This was done by determining which ESG paradigm best explained the M&A behavior. This study investigated the valuation implications of both overall ESG scores and those of each of the three ESG categories. A further contribution of this thesis is an examination of the valuation implications of the 'distance' between the ESG capabilities of two companies, i.e., the acquiring company and the target company. To accomplish these objectives, a cross-regional dataset of public M&A transactions records from North America and Europe was analyzed using multivariate ordinary least squares (OLS) regression, with year and industry fixed effects. Additionally, propensity score matching (PSM) was used as a supplementary robustness procedure to assess whether the ESG Distance result was sensitive to observable selection effects. The results of this study do not provide statistically significant evidence for a stand-alone "green premium" among the samples examined. More specifically, there was no relationship (statistically significant) between an overall target ESG rating or the individual ratings for each Environmental, Social, and Governance Pillar, and Acquisition Premiums shown in the estimated models. The data in this study do not provide evidence to support the "strategic catch-up" theory. The results from the model specification, which identifies poor ESG performers by using the absolute threshold of 0.25 of acquirer ESG scores, show that the interaction between the acquirer's low ESG status and the target's ESG is statistically significantly negative. This indicates that low-ESG acquirers do not pay higher premiums for more sustainable targets. However, perhaps most importantly, this study found a positive association between the absolute level of ESG distance and the acquisition premium. The inclusion of multiple control variables, along with an alternative distance specification, indicates that the results do not clearly demonstrate that ESG distance is valued purely because of cultural incompatibility or post-merger integration problems. Rather, the results can be interpreted as indicating that ESG capability gaps could potentially represent synergistic opportunities. As such, the findings appear to suggest that ESG capability gaps may be valued as potential sources of synergy in M&A transactions. The fact that the primary distance measure used is absolute rather than directional indicates that the results reflect only the extent of ESG differences between the two parties; they do not allow us to determine from which party's perspective the other party has better ESG capabilities.

Abstrakt (DE)

Ziel dieser Arbeit war es, zu ermitteln, wie sich die Umwelt-, Sozial- und Governance-Leistung (ESG) auf die Prämien bei Fusionen und Übernahmen (M&A) auswirkt. Dazu wurde untersucht, welches ESG-Paradigma das M&A-Verhalten am besten erklärt. Die Studie untersuchte die Auswirkungen sowohl der Gesamt-ESG-Werte als auch der Werte in jeder der drei ESG-Kategorien auf die Unternehmensbewertung. Ein weiterer Beitrag dieser Arbeit ist die Untersuchung der Auswirkungen der „Distanz“ zwischen den ESG-Fähigkeiten zweier Unternehmen – d. h. des erwerbenden Unternehmens und des Zielunternehmens – auf die Bewertung. Um diese Ziele zu erreichen, wurde ein regionenübergreifender Datensatz öffentlicher M&A-Transaktionen aus Nordamerika und Europa mittels multivariater OLS-Regression (Ordinary Least Squares) mit festen Effekten für Jahr und Branche analysiert. Zusätzlich wurde Propensity-Score-Matching (PSM) als ergänzendes Robustheitsverfahren eingesetzt, um zu beurteilen, ob das Ergebnis der ESG-Distanz empfindlich gegenüber beobachtbaren Selektionseffekten war. Die Ergebnisse dieser Studie liefern keine statistisch signifikanten Belege für einen eigenständigen „Green Premium“ unter den untersuchten Stichproben. Genauer gesagt gab es keinen (statistisch signifikanten) Zusammenhang zwischen einem Gesamt-ESG-Rating des Zielunternehmens oder den Einzelratings für jede der Säulen Umwelt, Soziales und Unternehmensführung und den in den geschätzten Modellen dargestellten Übernahmeprämien. Die Daten dieser Studie liefern keine Belege für die „Strategic Catch-up“-Theorie. Die Ergebnisse der Modellspezifikation, bei der Unternehmen mit schwacher ESG-Performance anhand eines absoluten Schwellenwerts von 0,25 der ESG-Werte des Erwerbers identifiziert werden, zeigen, dass die Wechselwirkung zwischen dem niedrigen ESG-Status des Erwerbers und dem ESG-Status des Zielunternehmens statistisch signifikant negativ ist. Dies deutet darauf hin, dass Erwerber mit niedrigem ESG-Status keine höheren Prämien für nachhaltigere Zielunternehmen zahlen. Am wichtigsten ist jedoch vielleicht, dass diese Studie einen positiven Zusammenhang zwischen dem absoluten Ausmaß der ESG-Distanz und der Übernahmeprämie feststellte. Die Einbeziehung mehrerer Kontrollvariablen sowie eine alternative Distanzspezifikation deuten darauf hin, dass die Ergebnisse nicht eindeutig belegen, dass die ESG-Distanz ausschließlich aufgrund kultureller Inkompatibilität oder Integrationsproblemen nach der Fusion bewertet wird. Vielmehr lassen sich die Ergebnisse so interpretieren, dass Lücken in der ESG-Kompetenz potenziell Synergiechancen darstellen könnten. Somit scheinen die Ergebnisse darauf hinzudeuten, dass ESG-

Kompetenzlücken als potenzielle Synergiequellen bei M&A-Transaktionen bewertet werden können. Die Tatsache, dass das primär verwendete Distanzmaß absolut und nicht direktional ist, deutet darauf hin, dass die Ergebnisse lediglich das Ausmaß der ESG-Unterschiede zwischen den beiden Parteien widerspiegeln; sie lassen keine Aussage darüber zu, aus der Perspektive welcher Partei die andere Partei über bessere ESG-Kompetenzen verfügt.

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Statutory Declaration:

AI-based tool (Gemini) was used to organize study materials, language revision, and summarizing literature. but the final content and conclusions remain solely my own.

List of Abbreviations

ACQ – Acquirer
CAR – Cumulative Abnormal Return
CLT – Central Limit Theorem
CSR – Corporate Social Responsibility
E – Environmental
ESG – Environmental, Social, and Governance
FE – Fixed Effects
G – Governance
H1 / H2 / H3 / H4 – Hypotheses 1, 2, 3, and 4
HMO – Health Maintenance Organization
LSEG – London Stock Exchange Group
M&A – Mergers and Acquisitions
M/B – Market-to-Book
MD&A – Management Discussion and Analysis
OLS – Ordinary Least Squares
PMI – Post-Merger Integration
PSM – Propensity Score Matching
REIT – Real Estate Investment Trust
ROA – Return on Assets
S – Social
SD – Standard Deviation
SE – Standard Error
SOC – Social Pillar Score
ENV – Environmental Pillar Score
GOV – Governance Pillar Score
TGT – Target
VIF – Variance Inflation Factor

Chapter 1: Introduction

The global mergers and acquisitions (M&A) market is a significant area of corporate investment decision-making and generates enormous capital flows worldwide each year (Zrigui et al., 2024; Tang et al., 2024). Alongside, ESG factors have transitioned from being considered ethical to becoming strategically imperative, transforming both markets and economies (Feng 2021; Zrigui et al., 2024). As such, there appears to be a correlation between investors' consideration of ESG factors for financial versus ethical purposes, with the vast majority citing financial reasons over ethical ones (Huang, 2022). Therefore, quantitatively assessing the economic implications of a company's sustainability performance will continue to become increasingly important, as anecdotal evidence shows that sustainable practices generally result in higher valuations of companies (e.g., good ESG/CSR performance), while unsustainable practices may serve as bargaining chips in negotiations to reduce purchase prices (Malik & Al Mamun, 2024; Gomes & Marsat, 2018).

Moreover, one of the primary questions facing scholars is whether sustainability-related activities produce value for shareholders or destroy shareholder wealth. In this regard, the long-standing debate between the Shareholder Expense View and the Stakeholder Value View continues to dominate much of the academic discussion (Teti & Spiga, 2023; Gomes & Marsat, 2018; Tampakoudis & Anagnostopoulou, 2020). The Shareholder Expense View states that investments made in Corporate Social Responsibility (CSR), ESG activities are inefficient uses of a company's resources and therefore could lead to lower premiums or discounts (Zheng et al., 2023; Teti & Spiga, 2023; Gomes & Marsat, 2018). On the other hand, supporters of the Stakeholder Value View argue that firms engaging in robust ESG activities benefit by mitigating risk, building goodwill, and creating competitive advantages, which justify paying greater premiums upon acquiring another entity (Gomes & Marsat, 2018; Gigante et al., 2025; Zheng et al., 2023; Tampakoudis & Anagnostopoulou, 2020).

Although researchers have been investigating this topic for many years, there is little conclusive empirical evidence establishing a link between ESG performance and total firm value (Zheng et al., 2023; Gomes & Marsat, 2018). Furthermore, the lack of clarity surrounding the connection between ESG and value creation is expanded when examining the specific financial context of M&A transactions. Although M&A represents an ideal case study for evaluating the value impact

of non-financial characteristics, the number of empirical studies that establish a direct connection between a firm's overall ESG rating and acquisition premiums is relatively small compared to those studying other forms of M&A-related non-financial attributes. Moreover, among the few studies that examine this issue using data from actual M&A transactions, results vary widely across analyses.

For example, some early studies found a statistically significant relationship between a target's CSR performance and its associated bid price premium (Baldi & Salvi, 2022; Gomes & Marsat, 2018). These studies were based on the premise that CSR signals quality and reduces specific types of risk for potential buyers (Baldi & Salvi, 2022). However, more recent studies have found no statistically significant effect of either a target's or an acquirer's aggregate CSR performance on the premium paid in M&A transactions (Jost et al., 2022). Additionally, most prior research has focused primarily on acquirers' perspectives and post-merger outcomes resulting from their acquisitions. Therefore, research on how pre-acquisition valuation affects the gains realized by targets during an acquisition transaction has been limited.

Research Objectives

This study aims to close this gap by providing a thorough empirical analysis of the influence of ESG metrics and ratings on discounts and premiums in mergers and acquisitions. In particular, this thesis has the objective to better specify three important and connected aspects that are currently unclear or insufficiently examined in existing literature:

1. **Pillars of Sustainability:** Separate out the individual effects of environmental, social, and governance sustainability dimensions on premiums. Previous studies generally relied on an aggregated score—an ESG rating for all dimensions combined, but they do not show which specific pillar of sustainability (environmental, social, or governance) generates the observed valuation impact (Zrigui et al., 2024; Gigante et al., 2025; Malik & Al Mamun, 2024). This study investigates the separate influences of each ESG dimension on M&A premiums.
2. **Bilateral Impact (Acquirer vs. Target):** The connection concerning corporate sustainability and M&A premiums is complex and cannot be interpreted as based solely on one side of the M&A process (the acquirer or target), as previously suggested (Jost et al.,

2022). Thus, this thesis examines the relations between sustainability and M&A premiums using data collected on both sides of the M&A process, acknowledging that both sides have a vested interest in negotiating a deal premium.

3. **Sustainability Distance Between Parties:** Another significant gap exists in the systematic investigation of the impact of similarities or differences in the sustainability orientations of the two companies involved in an M&A on M&A prices. While the existing literature suggests that a greater ESG performance gap serves as a proxy for expected cultural conflicts or integration difficulties that will lower future returns, it also implies that a smaller ESG distance indicates less conflict and greater synergies (Bereskin et al., 2018). Therefore, this thesis investigates whether a relative ESG distance between parties will explain the occurrence of premiums or discounts in M&A prices.

Background and Motivation

The following background and motivation section provides a summary of why mergers and acquisitions (M&A) and the increasing emphasis on ESG will be addressed within this thesis.

Mergers and acquisitions can significantly impact the long-term viability of firms and require substantial investments from acquiring companies (Antoniou et al. 2008, Arouri et al. 2019, Baldi & Salvi 2022, Jost et al. 2022). A key aspect of M&As is the acquisition premium the buyer pays to acquire the target company's shares. This premium represents the difference between what the buyer is willing to pay for the target's shares and the target's previous stock price before the M&A announcement. It captures various aspects of a transaction, including synergy, control value, and potential overpayment (Antoniou et al. 2008, Baldi & Salvi, 2022, Gigante et al. 2025).

A positive acquisition premium indicates that the buyer expects benefits from the M&A, including increased shareholder value. On the other hand, if no premium is paid, it may indicate negative synergistic impacts to the deal. In either case, the decision to purchase a target company is heavily influenced by expectations regarding the deal's future outcomes.

Recently, however, changes in the way corporate decisions are made are being driven by an increased emphasis on ESG issues (Cornell & Shapiro, 2021; Galpin & De Vibe, 2024; Gigante et al., 2025; Huang, 2022). Although CSR initiatives were originally developed as voluntary frameworks to guide corporate behavior, they are increasingly incorporated into a firm's core

strategies and considered during investor due diligence (Galpin & De Vibe, 2024; Gigante et al., 2025; Huang, 2022; Malik & Al Mamun, 2024).

Surveys of industry participants demonstrate that corporate buyers consider sustainability performance in evaluating deals. Specifically, those bidders who identify with sustainability performance are rewarded through higher valuations. On the contrary, poor sustainability performance can result in lower valuations (Galpin & De Vibe, 2024; Gomes & Marsat, 2018). These findings suggest that sustainability performance has become a critical component of M&A evaluation. As such, this strategic focus requires reconsidering the role corporate purpose plays in guiding M&A activity.

In theory, there exist two competing views about corporate purpose. The first view asserts that expenses associated with ESG initiatives represent a form of waste that should be minimized because they do nothing but reduce profitability (Shareholder Expense View). The second view suggests that ESG initiatives contribute positively to corporate profitability by reducing operational risks and improving competitiveness (Stakeholder Value View) (Arouri et al., 2019; Cornell & Shapiro, 2021; Gomes & Marsat, 2018; Teti & Spiga, 2023).

Empirical studies examining the relationship between ESG performance and corporate profitability have yielded inconsistent results, suggesting that individual investors face challenges in estimating the financial implications of ESG-related activities (Gigante et al., 2025; Gomes & Marsat, 2018; Huang, 2022).

One area where these challenges are most pronounced is in evaluating M&A transactions. Unlike general market trading activity, strategic acquirers conduct extensive due diligence to assess the accuracy of information provided by a target concerning its ESG-related liabilities and true value (Feng, 2021; Galpin & De Vibe, 2024; Gomes & Marsat, 2018).

Although researchers have examined the relationships between ESG metrics and M&A premiums, few rigorous quantitative analyses exist (Gomes & Marsat, 2018; Jost et al., 2022; Zrigui et al., 2024). These existing studies have generated conflicting results.

This investigation will thus enter an area of analysis where little has previously been undertaken to clarify ESG's role in investor valuations. As Jost et al. (2022) and others have noted, most prior research in this field has used aggregated ESG measures—often a single score—which can dim

the distinct valuation effects of the Environment, Social, and Governance pillars. In addition to the above limitations, the current body of knowledge has relatively infrequently assessed the relative distance between the acquiring firm and the acquired firm's levels of sustainability. Tang et al. (2024) found that the distance between merging firms is a useful indicator of the likely costs of integrating a merged entity and of possible cultural differences that may limit the expected synergistic benefits from such acquisitions.

Thus, by systematically estimating the effects of both overall and pillar-level ESG measures, as well as the distance between the firms involved in mergers and acquisitions, we hope to collect comprehensive empirical data on how investors strategically use sustainability-related performance metrics to determine value in large-scale merger and acquisition transactions.

1.2. Problem Statement and Research Question

Corporate Mergers and Acquisitions continue to be among the largest investments made by companies worldwide. These Mergers and Acquisitions generate substantial capital flows and have had an immense impact on the corporation's long-term value (Arouri et al., 2019; Baldi & Salvi, 2022). There is escalating pressure today on corporations regarding ESG initiatives. As such, there is increasing pressure on corporations to better demonstrate their commitment to these issues as a strategic imperative (Gigante et al., 2025). However, it appears there may be a disconnect in how these expenditures are viewed from a theoretical perspective. Specifically, when considering the financial aspects of Corporate Social Responsibility, Environmental, Social and Governance initiatives, two distinct views appear to exist. The first view suggests that shareholders expect returns on investment and that funds diverted toward CSR/ESG would result in inefficient use of shareholder capital (Shareholder Expense View) and thus lower valuations (Arouri et al., 2019; Gomes & Marsat, 2018; Tampakoudis & Anagnostopoulou, 2020). The second view asserts that engaging in CSR/ESG will reduce risks associated specifically with the company, build a positive image of the company, and ultimately increase the ability of the company to compete (Stakeholder Value View); thus, supporting increased premium payments for acquisitions (Arouri et al., 2019; Gigante et al., 2025; Gomes & Marsat, 2018; Tampakoudis & Anagnostopoulou, 2020).

Although evidence demonstrates a relationship between ESG performance and premium prices (Gomes & Marsat, 2018; Malik & Al Mamun, 2024), research examining the relationship between

ESG performance and merger premium payments at the transaction level remains limited. Although previous studies indicate that high levels of ESG performance contribute positively to merger premium payments, while low levels of ESG performance serve as a potential bargaining chip during negotiations, the mechanisms by which perceived ESG quality translates into actual valuation metrics remain poorly understood.

Therefore, given prior research indicating a gap in our understanding of translating ESG data into valuation metrics for mergers and acquisitions, further investigation is necessary. In particular, the degree to which the merging parties' ESG profiles align or differ indicates the likelihood of success in post-merger integration. For example, if a large difference, or "ESG Distance," exists between the acquiring and acquired entities, markets anticipate additional challenges and costs related to integrating cultures, thereby diminishing the perceived value of anticipated synergies (Tang et al., 2024). Alternatively, convergence of ESG policies suggests an easier path towards integration and the realization of synergistic opportunities.

Research Questions This theoretical conflict has existed for a long time, and there have been few studies to address the empirical gap. As such, these research questions guide this study:

Primary Research Question: To what degree will the respective ESG ratings of the target and the acquirer, along with their relative proximity (relational distance), influence the difference (premium/discount) in price that the acquiring firm pays to purchase the target company?

Sub-Questions:

1. Is it an aggregation of all three dimensions (Environmental, Social, Governance) of a company's ESG rating, or are the effects driven solely by one dimension over another in determining a company's sustainability impact on deal value? (Gigante et al., 2025; Gomes & Marsat, 2018; Malik & Al Mamun, 2024)
2. How does the ESG distance (the amount of dissimilarity in each company's commitment to sustainability) between the acquiring company and the target company determine whether the acquired company receives a higher-than-market price (premium) or a lower-than-market price (discount), thereby reflecting the market's anticipation of post-merger integration success or failure? (Tang et al., 2024)

1.3. Objectives and Contributions

Our goal is to overcome many of the current disagreements about how ESG performance is measured and priced in the intense environment of M&A transactions by developing a unified, comprehensive empirical framework for its measurement and pricing. We also aim to resolve an ongoing theoretical dispute, the Shareholder Expense View vs. the Stakeholder Value View by methodically separating out the influence of sustainability on the final negotiated acquisition premium or discount.

Our three main goals for this research project include:

1. **To identify the distinct valuation influences from each pillar:** previous studies have attempted to find relationships between sustainability and valuation using general or aggregated ESG/CSR measures, resulting in inconclusive and inconsistent findings (Baldi & Salvi, 2022; Gomes & Marsat, 2018; Jost et al., 2022). In contrast, our study will perform a detailed, segmented analysis to determine whether the valuation effect can be uniquely attributed to one of the Environmental, Social, or Governance pillars of the target company. Although some evidence exists that environmental performance is always valued (Gomes & Marsat, 2018; Malik & Al Mamun, 2024), there is very little evidence regarding the impacts of the other two areas of focus (social and governance) except when used in combination with limited forms of transaction types such as cross-border acquisitions (Gomes & Marsat, 2018); therefore, we believe that the overall valuation effect is going to be influenced in a non-uniform way (Malik & Al Mamun, 2024).
2. **To examine the Acquirer's strategic perspective (moderation):** The acquisition premium is ultimately determined through strategic negotiation. As such, we recognize that analyzing the target firm's characteristics alone is insufficient to understand the ultimate pricing decision (Jost et al., 2022). An additional purpose of this study is to investigate whether the pre-acquisition ESG performance of the acquiring firm moderates the relationship between the target firm's ESG and the size of the deal premium. If so, do firms with strong ESG performance pay more for their targets to ensure a strong cultural fit with the acquired entity and to smooth the transition process for post-merger integration? It has been well established that successful merger synergies require cultural fit and effective communication (Malik & Al Mamun, 2024; Wang & Wu, 2024).

3. **To systematically evaluate relational risk (ESG Distance):** Arguably, the biggest empirical gap this research fills is the quantification of risk based on differences in ESG ratings. Research demonstrates that large gaps in ESG metrics between the parties involved in a merger ("cultural clashes") lead to negative outcomes after the merger, including lower cumulative abnormal returns (CARs) and higher crash risk (Tang et al., 2024). This study aims to bridge the gap between risk research and pricing research by examining whether documented risk at the time of a merger affects valuation, either through a discounted price or a premium paid to shareholders at the announcement stage (Tang et al., 2024).

By conducting these goals under a singularly rigorous empirical model, this thesis contributes to both corporate finance and strategic management research:

- **Clarify the Financial Value of Intangibles:** This study provides an approach to determining the economic value of intangible assets by using premiums paid in acquisitions (Malik & Al Mamun, 2024). In doing so, it will provide a clearer answer to whether ESG characteristics are reflected in acquisition premiums in public M&A transactions. The focus is on the use of premiums and discounts associated with sustainability rather than CARs to establish a clearer understanding of how these investments generate returns.
- **Expand the Literature on Merger and Acquisition Valuation:** This study extends the literature regarding what ESG related attributes are to be analyzed as part of mergers and acquisitions value analysis when looking at both the absolute quality of sustainability characteristics (overall ESG and pillar scores) and how well a merging firm's ESG attributes match each other with the attribute levels of their acquiring firm (ESG distance). In the reported sample, ESG distance appears more informative for acquisition premiums than standalone ESG or pillar scores. As such, the findings offer a richer set of tools for practitioners to conduct due diligence for potential mergers and acquisitions, as well as for assessing valuation, particularly for identifying synergy risks related to cultural compatibility.
- **Increase Understanding of Single-Pillar Economic Theory:** In addition to distinguishing between Environmental, Social, and Governance dimensions conceptually, the study contributes to the discussion of whether ESG effects are likely to be uniform across settings. Although the reported regressions do not identify statistically significant

pillar-specific effects in the sample, the framework helps clarify how future research may examine whether these differences matter more strongly in settings such as cross-border deals. Therefore, it addresses many of the issues identified in prior studies (Teti et al., 2022) regarding the lack of clarity surrounding which aspects of sustainability result in increased shareholder wealth. It does so by moving the discussion away from whether ESG is important and toward how and why sustainability initiatives affect shareholder wealth.

Chapter 2: Theoretical Framework and Literature Overview

There are many researchers who investigate the extent to which ESG factors affect the level of M&A premiums. Thereby, they contribute to both Corporate Finance and Strategic Management fields, as well as to the longest-standing opposition in corporate governance theory: the Shareholders' Expenses View and the Stakeholder Value Maximization View.

2.1. The Long-Standing Theoretical Rivalry: Shareholder vs. Stakeholder Models

The core issue is whether the company's investment in CSR/ESG will have a positive impact or a negative impact on its economic performance.

The Shareholders' Expenses View is based on the Neoclassic Paradigm. It assumes that expenses incurred for non-economic objectives are an inefficient use of available funds (Teti & Spiga, 2023). In case there is an impression that such expenses serve the manager's self-interests (for example, developing his/her reputation), or in other words, such expenses represent agency costs, then they are believed to be used at the expense of shareholders' welfare (Taglialatela et al., 2024; Arouri et al., 2019; Cornell & Shapiro, 2021; Teti & Spiga, 2023). Therefore, if the acquirer expects the target with higher ESG performance to be financially inefficient, he or she will seek a discount on the M&A premium or simply offer a lower premium than expected (Gomes & Marsat, 2018; Teti & Spiga, 2023).

The Stakeholder Value Maximization View: According to this opposing point of view, companies can achieve ethical actions without being forced to make concessions related to their financial performance (Gomes & Marsat, 2018; Teti & Spiga, 2023). Companies can build relationships with a wide variety of stakeholders by addressing their needs. By doing so, companies can establish good relations, generate goodwill, and build up a certain reputation among

stakeholders (Malik & Al Mamun, 2024; Arouri et al., 2019; Taglialatela et al., 2024; Teti & Spiga, 2023; Zheng et al., 2023). Strong engagement in ESG sends out a signal about reduced risk associated with specific characteristics of a company including the risk of negative consequences resulting from legal problems, bad publicity, or unexpected losses in revenues due to unforeseen negative events (Ozdemir et al., 2022; Aouadi & Marsat, 2018; Malik & Al Mamun, 2024). These types of risks may be seen by investors as equivalent to purchasing insurance against potential harm to their assets. Therefore, the value creation from ESG can justify the payment of acquisition premiums (Gomes & Marsat, 2018; Malik & Al Mamun, 2024).

Although many studies investigated the above-mentioned relation, there is still a considerable amount of confusion regarding this issue in archival research examining marginal investors (Gomes & Marsat, 2018; Jo & Harjoto, 2011; Ozdemir et al., 2022; Teti & Spiga, 2023; Giese et al., 2019). This uncertainty is further exacerbated by the intangible nature of the benefits from ESG activities (e.g., corporate reputation and culture), which makes it difficult to estimate their true value (Gomes & Marsat, 2018).

2.2. ESG as a Strategic Catalyst in M&A Valuation

Mergers and Acquisitions: A Testing Ground for Theories Regarding ESG And Its Use as A Tool to Mitigate Information Asymmetry In M&A Transactions

To understand the use of ESG as a device for mitigating information asymmetry in mergers and acquisitions, it will be helpful to examine the M&A process. One of the most important ways to address information asymmetry in M&A transactions is through due diligence. Due diligence is a thorough analysis of a company's operations and financials before deciding whether to purchase. As such, the time and resources companies spend on due diligence represent an effort to obtain as much information as possible about the target company. While due diligence may help address information asymmetry, the fact remains that some level of asymmetry will always remain. Therefore, it is reasonable to assume that firms will continue to use the tools available to them to reduce their exposure to information asymmetry. Gomes and Marsat (2018) state that strategic acquirers "engage in extensive due diligence" to reduce information asymmetry and assess the target's true worth, including its non-market-based assets.

Therefore, when examining the extent to which ESG serves as an indicator of target sustainability, empirical research has demonstrated that a target's ESG profile serves as a key determinant in the offer price received from potential buyers:

- **Signaling Mechanisms:** Research demonstrates that positive signals related to CSR/ESG enhance a company's reputation and therefore serve as a means for firms to demonstrate their quality and credibility. These positive signals reduce information asymmetry associated with due diligence, thereby influencing buyer behavior (Huang, 2022; Malik & Al Mamun, 2024; Ozdemir et al., 2022; Yu et al., 2018). This signaling role is particularly significant in cross-border deals, where complexity and risk are significantly greater, necessitating robust, credible sources of outside data for buyers (Gomes & Marsat, 2018).
- **Premiums and Discounts:** Qualitative evidence consistently indicates that high levels of CSR are positively integrated and rewarded by bidders when evaluating targets. Conversely, bidders also commonly use poor CSR performance as leverage in negotiations to achieve discounts (Gomes & Marsat, 2018; Ozdemir et al., 2022).
- **The Value of The Individual Pillars:** Valuations are rarely uniform across the specific ESG pillars. Instead, some studies indicate that both Environmental and Social dimensions are usually positively correlated with bid premiums, often commanding the highest value (Gomes & Marsat, 2018; Malik & Al Mamun, 2024). Specifically, environmental engagement reduces litigation risks and spillovers (Gomes & Marsat, 2018), while the social dimension is highly valued in international deals because it mitigates information asymmetry related to culture and national context (Gomes & Marsat, 2018). Conversely, negative attributes—such as corporate social irresponsibility (CSiR) or ESG controversies—are often used to negotiate lower premiums (Gigante et al., 2025; Malik & Al Mamun, 2024; Ozdemir et al., 2022).

2.3. The Relational Perspective: ESG Distance and Integration Risk

The relational perspective provides evidence that ESG distance and integration risk play an important role in M&A transactions. Tang et al. (2024) recently demonstrated that ESG distance (the difference between the ESG scores of the acquirer and the target) can be used to assess the degree of cultural similarity or dissimilarity between the parties involved, which can be associated with future integration risks.

- **Consequences for returns and risk:** Transactions characterized by a large ESG distance were viewed by the capital markets as having a higher likelihood of post-merger integration difficulties (Tang et al., 2024). Consequently, anticipated integration difficulties led to significantly lower CARs surrounding the transaction announcement (Tang et al., 2024). Tang et al. (2024) also discovered that a positive relationship existed between the size of the ESG distance and both post-merger crash risk and poor long-term operational results for the acquiring entity.
- **Bargaining dynamics:** Evidence indicates that ESG disparities will influence how negotiations unfold during a merger. A significant ESG distance reduces companies' willingness to merge and lengthens the time required to negotiate such deals, especially when the target company holds a superior bargaining position (Tang et al., 2024).
- **Strategy of Acquirer:** Finally, the ESG performance of the acquiring company itself is also relevant. High-ESG acquirers benefit from lower information asymmetry and lower funding costs than low-ESG acquirers, thereby being more likely to make all-cash offers when acquiring a target (Hussaini et al., 2023). Furthermore, while high-ESG acquirers will offer more money to buy targets when they anticipate cultural fit and synergies, low-ESG acquirers may also pay a premium to compensate for their own weaknesses (Gigante et al., 2025; Malik & Al Mamun, 2024).

2.4. A synthesis of the identified research gap

There is an abundance of empirical evidence that demonstrates the value placed by investors on ESG attributes during mergers and acquisitions; however, the relationship is complex and often subject to mitigating variables like corporate governance, information asymmetry, and the relationship dynamics between the two companies involved (Jost et al., 2022; Khan et al., 2024). Previous research has primarily focused on either long-term outcomes for the acquirer or the total target premium (Malik & Al Mamun, 2024).

This proposed research seeks to offer a new picture of all aspects of ESG valuation by providing answers to three key gaps currently not well covered from prior research:

1. **Differential Pillars within Premiums:** The positive correlation between target CSR/ESG and premiums is acknowledged; however, there remains debate over whether each ESG pillar separately influences premiums (Gomes & Marsat, 2018; Malik & Al Mamun, 2024; Teti et al., 2022). This study will rigorously test the separate impact of Environmental, Social, and Governance pillars on Acquisition Premiums and determine if any single pillar particularly generates the observed valuation effect(s).
2. **The Quantification of ESG Distance Effects on Valuations:** There is considerable literature showing that ESG distance negatively impacts merger success metrics (such as Cumulative Abnormal Returns and crash risk) (Tang et al., 2024); however, this cultural misalignment risk, specifically impacting the acquisition premium/discounts offered to targets, needs to be directly investigated.
3. **Merging Parties' Interdependency through their ESG Attributes on Valuations:** By modeling premium as a function of both the acquirer's and target's ESG attributes, this research examines the interdependencies between merging parties, particularly the extent to which the acquirer's ESG attributes moderate the target's valuation.

Thus, this research is justified by the need to transition from researching ambiguous overall market perceptions to researching the quantifiable influences of well-defined ESG metrics (total aggregated score, pillar scores, disentangling ESG scores and relative distance) on the most definitive outcome of M&A negotiations: the acquisition premium/discount.

2.5. Hypothesis Development

In the fast-growing field of international mergers and acquisitions, where recent year-end transaction volume reached \$4.8 trillion (Kumar, 2025), there remains a persistent dilemma for companies involved in the merger and acquisition process: Does a company's social and ethical responsibility influence the price it pays? The academic community remains divided over whether a company's sustainability efforts represent wasted funds (the shareholder-expense view) or a deliberate gain for long-term success (the stakeholder-value view). The following hypotheses translate the theoretical arguments in the literature into testable predictions about M&A premiums.

Hypothesis 1. Quality signal effect. H1 (signaling hypothesis): It can be anticipated that the Target firms will receive higher acquisition premiums if there are better quality signals of high levels of ESG performance (i.e., strong scores) of the Target firm because the stakeholder value perspective along with the signaling theory indicate that the Target firm's better ESG performance would reduce firm-specific risk, and subsequently, information asymmetry, thereby making the Target firm more attractive to potential buyers (Gomes & Marsat, 2018).

Hypothesis 2. Specific pillars represent unique valuations. H2 (pillar salience hypothesis): Based upon the premise that the environmental and social issues will create visible operational, legal, and reputational liabilities during the due-diligence process, it is expected that the acquisition premium will be positively associated to greater degrees with the environmental and social pillars than with the governance pillar. As such, the governance issue may serve as an example of a baseline requirement rather than a distinct contributor to the acquisition premium (Baldi & Salvi, 2022; Gomes & Marsat, 2018; Malik & Al Mamun, 2024).

Hypothesis 3. Culture clash discounts. H3 (integration risk hypothesis): A greater ESG gap between the Target company and the acquiring company will result in a lower acquisition premium. According to this rationale, the larger ESG difference between two companies may suggest that there will be greater cultural compatibility problems after a merger occurs. These increased compatibility problems can lead to higher post-merger integration costs and less synergy than would exist without these compatibility problems (Tang et al., 2024).

Hypothesis 4. Strategic legitimacy seeking through mergers. H4 (reputation repair hypothesis): The relationship between a Target company's ESG score and acquisition premium is

expected to be more pronounced when the acquiring company has poor pre-acquisition ESG standing. According to this rationale, acquiring companies with poor ESG standing will utilize mergers to rapidly establish credibility as legitimate ESG players. Therefore, they will likely offer a premium for target companies with excellent ESG performance (Gomes & Marsat, 2018; Malik & Al Mamun, 2024).

2.6. Summary of Hypotheses

This paper tests four different hypotheses based on the Shareholder Expense View and Stakeholder Value Maximization View of how mergers and acquisitions are priced.

- **H1 (Quality Signal Hypothesis):** Higher target ESG performance or score is expected to be positively correlated with acquisition premiums.
- **H2 (Pillar Salience Hypothesis):** The environmental and social pillars are expected to have stronger positive associations with acquisition premiums than the governance pillar.
- **H3 (Culture Clash or Integration Friction Hypothesis):** Larger ESG distance between the acquirer and the target is expected to be negatively associated with acquisition premiums.
- **H4 (Strategic Catch-Up or Reputation Repair Hypothesis):** The positive association between target ESG and acquisition premiums is expected to be stronger when the acquirer has weak ESG standing.

3.1. Data Sources and Sample Creation

The final data set created for this study combines distinct datasets of a broad cross-regional sample of public M&A transactions to provide an overview of the M&A spectrum. To empirically test the hypotheses proposed in this paper, this study uses a single, complete data set comprising transaction information and sustainability metrics for public companies. All primary transaction data, firm-specific financials, and specialized ESG databases were accessed exclusively through the Refinitiv Workspace platform (which incorporates the former Thomson Reuters ASSET4 framework) to ensure absolute data consistency.

Sample creation and filtering processes followed strict guidelines to identify only those M&A transactions representing a material transfer of ownership:

- **Timeframe and Geographic Location:** Transactions initiated and completed during the period from January 1, 2006, through December 31, 2025, are included in the original sample. Since there may be variation in reporting practices for ESG metrics, the geographic scope of the sample is limited to firms headquartered in North America and Europe.
- **Deal Completion Status and Ownership Transfer:** Only transactions classified as having been "completed" are considered. Additionally, the transaction had to be characterized by a successful transfer of at least 50% of the target corporation's outstanding equity to the acquiring corporation after the merger.
- **Economic Significance:** To eliminate what would otherwise be irrelevant and noisy data (e.g., micro-capitalization M&A transactions involving little more than asset transfers), transactions valued at less than \$100 million were excluded.
- **Filtering Financial Firms and Utility Companies:** As is common practice in academic literature, firms operating in the financial and utility sectors have been excluded because each industry has its own unique regulatory frameworks and reporting requirements (Arouri et al., 2019; Deng et al., 2013). However, some neighboring and infrastructure classifications remained in the study because industries are coded in databases and because these classifications do not clearly fit into an excluded category.
- **Data Availability:** Any transaction that lacked sufficient ESG scores prior to completion for either the acquirer or the target, or any necessary continuous financial control variables (such as size, leverage, etc.) needed to estimate the multivariate regression equations, has also been eliminated.
- **Transactional Data:** The initial universe for a cross-regional sample of North American and European public M&A transactions spanning 2006 to 2025 was obtained from SDC Platinum (via Refinitiv). This timeframe is important because it marks when ESG moved from a peripheral topic in corporate finance to a central component of every company's operation (Galpin & de Vibe, 2024). Standard filters were applied to ensure both parties were publicly traded, enabling the total price paid per share to be accurately calculated

based on historical stock prices (Baldi & Salvi, 2022; Gigante et al., 2025; Gomes & Marsat, 2018).

- **Sustainability Performance Data:** Sustainability performance data were acquired from the LSEG database (accessed directly through the Refinitiv platform), which utilize peer group benchmarks to assign numerical scores to environmental, social, and governance performance (Malik & Al Mamun, 2024; Gomes & Marsat, 2018; Gigante et al., 2025; Jo & Harjoto, 2011).

The first step of the process provided a total number of 222 transactions. Upon moving the data into R for analysis, **listwise deletion** of 23 transactions with missing values (for at least one of the variables used in each model) resulted in a usable regression sample of 199. When the specifications using year and industry fixed effects were implemented, the number of observations available to estimate the parameters in these models was reduced further; only 156 transactions provided usable within-group variation after the fixed effects were applied.

Table 1: Distribution of Transactions by Target Industry

Target Industry	Number of Deals	Percentage (%)
Oil & Gas	32	16.08
Metals & Mining	27	13.57
REITs	23	11.56
Semiconductors	9	4.52
Building/Construction & Engineering	8	4.02
Professional Services	7	3.52
Automobiles & Components	6	3.02
Casinos & Gaming	6	3.02
Food and Beverage	5	2.51
Healthcare Equipment & Supplies	5	2.51
Healthcare Providers & Services (HMOs)	5	2.51
Other Consumer Products	5	2.51
Other Financials	5	2.51
Biotechnology	4	2.01
Other Industrials	4	2.01
Electronics	3	1.51
Machinery	3	1.51
Paper & Forest Products	3	1.51
Pharmaceuticals	3	1.51
Transportation & Infrastructure	3	1.51
Advertising & Marketing	2	1.01
Chemicals	2	1.01
Computers & Peripherals	2	1.01

Target Industry	Number of Deals	Percentage (%)
Home Furnishings	2	1.01
IT Consulting & Services	2	1.01
Internet Software & Services	2	1.01
Real Estate Management & Development	2	1.01
Recreation & Leisure	2	1.01
Aerospace & Defense	1	0.50
Apparel Retailing	1	0.50
Automotive Retailing	1	0.50
Broadcasting	1	0.50
Cable	1	0.50
Containers & Packaging	1	0.50
E-commerce / B2B	1	0.50
Home Improvement Retailing	1	0.50
Hotels and Lodging	1	0.50
Non-Residential	1	0.50
Other Materials	1	0.50
Other Real Estate	1	0.50
Publishing	1	0.50
Software	1	0.50
Telecommunications Equipment	1	0.50
Telecommunications Services	1	0.50
Water and Waste Management	1	0.50

Note: Table 1 contains Source Industry Classifications. As categories, including REITs, Other Financials and Water & Waste management are included within the final data sample due to their classification of being outside the Excluded Set of Traditional Financial Institutions and Regulated Utility Firms for the Screening Procedure.

Table 2: Distribution of Transactions by Year

Year	Number of Deals	Percentage (%)
2006	2	1.01
2007	3	1.51
2009	1	0.50
2010	2	1.01
2011	2	1.01
2012	3	1.51
2013	1	0.50
2014	3	1.51
2015	16	8.04
2016	8	4.02
2017	18	9.05
2018	19	9.55
2019	28	14.07
2020	20	10.05
2021	16	8.04
2022	8	4.02
2023	14	7.04
2024	16	8.04
2025	19	9.55

Note: Years with zero observations are omitted from the table.

3.2. Variable Definitions

3.2.1. The Dependent Variable: Acquisition Premium

The dependent variable in this project is the acquisition premium. The key goal of the study is to find a measurement for the acquisition premium i.e., how much the acquirer will pay above the target company's independent worth. In line with previous research in the mergers and acquisitions literature, the premium is not measured relative to the price investors paid for the target company's shares at the time of the merger or takeover announcement. There are several different ways to argue against using this methodology for valuing companies. First, the possibility exists for the spread of "rumors" or leakage of news of pending mergers and takeovers before they are officially announced. The potential for such rumors to lead to rapid increases in the stock price of the target company when they come out into the open will exist (Gomes & Marsat, 2018; Tampakoudis & Anagnostopoulou, 2020; Zrigui et al., 2024). However, the increases associated with pre-announcement activity are very likely to be over-stated, since they would be based upon both the rumors themselves and the expectations of investors who perceive that rumors like these have predictive power regarding future stock prices. Thus, using the target company's stock price on the date of the official announcement would yield premiums that do not accurately reflect either the valuations placed on the target firm by its shareholders or those of potential buyers. By calculating premiums as a function of the target company's closing price twenty-eight calendar days (four weeks) prior to the date when the merger was announced to the world (the unaffected window), we can estimate premiums that reflect the valuations that were placed upon the target firm by its shareholders and potential bidders over an unexaggerated period of time. The length of our unaffected window is also consistent with that used by Schwert (1996).

The acquisition premium for the firm is defined as:

$$Premium_i = \frac{P_{offer,i} - P_{i,t-28}}{P_{i,t-28}}$$

- $Premium_i$: acquisition premium for transaction i , reported in decimal form
- $P_{offer,i}$: final offer price per share paid by the acquirer for target i .
- $P_{i,t-28}$: target's closing share price 28 days prior to the announcement.

Note: a value of 0.1 corresponds to a 10% premium.

3.2.2. The Independent Variables: ESG Metrics and Distance

The independent variables used to evaluate the hypotheses are based on the use of ESG metrics, sourced from the London Stock Exchange Group (LSEG) Database (formerly Refinitiv Eikon).

- **For Testing H1 & H2 (Quality and Pillars):** In order to assess the stand-alone value of sustainability, the models will use both the target's total ESG Score (Target ESG) and the decompositions of each of the three pillar-based ESG Scores – Environmental (Target ENV), Social (Target SOC), and Governance (Target GOV).

For Testing H3 (Resource Heterogeneity-Standard Distance): A Standard Absolute ESG Distance Measure was also developed to measure the degree of “cultural fit” in the deal. The measure compares the ESG score of the target with that of the acquiring company. However, because it uses absolute values, it can be used to determine how large the sustainability gap is (irrespective of who has the larger ESG score).

$$ESG\ Distance_{i,t-1} = |Target\ ESG_{i,t-1} - Acquirer\ ESG_{i,t-1}|$$

- For Testing H3 (Robustness Check - Jaffe Distance): Additionally, as part of a robustness check, the Multidimensional Jaffe (1986) Distance Measure was employed.

$$JaffeDistance_i(X_i, Y_i) = \arccos\left(\frac{(x_i \cdot y_i)}{\|x_i\| \|y_i\|}\right)$$

Unlike measuring the distance between two aggregate scores, this approach views corporate culture as a multivariate vector; therefore, instead of just calculating the difference in aggregate scores, it determines the angular separation (derived from cosine similarity) between two companies' respective ESG scores across 10 categories included within the LSEG database (Emissions, Innovation, Resource Usage, Workforce, Human Rights, Community, Product Responsibility, Management, Shareholders and CSR Strategy) so as to provide a very detailed assessment of cultural alignment.

- To test whether acquirers with weak pre-deal ESG standing pay more for sustainable targets, a binary variable (Desperate Acquirer Dummy) was constructed from the acquirer's Refinitiv/LSEG Overall ESG Score. The dummy equals 1 if the acquirer's overall ESG score in the fiscal year prior to the M&A announcement (t-1) is less than or equal to 0.25

on the rescaled 0–1 ESG scale, and 0 otherwise. This cutoff corresponds to 25 on the original 0–100 LSEG scale. The measure is based on low overall ESG standing, not on controversy scores, controversy events, or severe indicators. The dummy is then interacted with the target firm’s total ESG score to test whether low-ESG acquirers pay different premiums for more sustainable targets.

$$Desperate * TargetESG_{i,t-1} = DesperateACQDummy_{i,t-1} * TargetESG_{i,t-1}$$

In the interaction specification, *DesperateACQDummy_{i,t-1}* represents a binary variable that is equal to 1 if the acquirers' lagged Refinitiv / LSEG overall ESG score is less than or equal to .25 on a rescaled scale of 0 - 1 in fiscal year prior to announcement date and is 0 otherwise. The threshold of 25 on the original scale of 0 – 100 represents weak pre-deal ESG standing, rather than ESG controversy intensity.

3.2.3. Control Variables

The study includes a wide range of control variables to isolate the ESG factor. These include relative size of the target company to account for differences in integration complexity, and cash versus stock payments to account for tax and signaling factors. (Gigante et al., 2025; Gomes & Marsat, 2018; Wang & Wu, 2024). The control variables include acquirer size, target size, acquirer leverage, target leverage, acquirer ROA, target ROA, acquirer market-to-book, target market-to-book, acquirer cash holdings, target run-up, relative size, an all-cash payment, a cross-border, and a same-industry.

3.3. Specification of the Regression Model and Preparation of the Data

The empirical analysis uses an OLS regression to determine how ESG-related factors affect the premium paid by acquiring companies. Data quality was improved through additional processing steps, including the reduction of extreme values due to potential outliers. Regarding extreme value reductions, two types of processing can occur. The first type is called winsorizing. Winsorizing involves capping values at certain levels. For example, if we winsorize at the 1st percentile or 99th percentile, then we have effectively removed the most extreme values. However, it is still possible to observe a large portion of the remaining values. The primary financial variables for this study, winsorized at the 1st and 99th percentiles, include Acquisition Premium, Leverage, Return on Assets (ROA), Market-to-Book Ratio, Cash Holdings, Relative Size, and Run-Up. Although the

market-to-book variable values were winsorized in the 1st and 99th percentiles, a few negative ratios remained in the data set. This is because firms with very small or negative book equity may produce unusual M/B ratios. Winsorizing has become increasingly common throughout the field of mergers and acquisitions (M&A) and corporate finance as a means of reducing outlier effects without eliminating them from the dataset.

After applying each of the above-mentioned data pre-processing techniques, a series of diagnostic tests was performed to assess whether the overall regression framework could yield reliable results. A multivariate diagnostic test, the Variance Inflation Factor (VIF), was used to assess multicollinearity among the independent variables. The (VIF) measures the extent to which the correlation among independent variables causes instability in estimates of regression coefficients. The recommended maximum threshold value is 10.0. With respect to our analysis, none of the key explanatory variables contained in the model exceeds the 10.0 threshold; thus, severe multicollinearity is not a significant issue.

In addition to assessing multicollinearity, further diagnostic tests were also conducted to assess non-normal residuals and heteroscedasticity. Based on visual assessment and statistical tests, there appears to be residual non-normality in the regression residuals. Given the sample size and the use of heteroskedasticity-robust standard errors clustered at the acquirer level, estimation and hypothesis testing rely on asymptotic assumption.

Although a formal test for heteroscedasticity did not reveal statistically significant evidence against homoscedasticity in the baseline model, heteroscedasticity-robust standard errors clustered at the acquirer level are provided for all regression models examined in this dissertation as a conservative precautionary measure.

Year fixed effects are employed to account for the possible occurrence of some time-specific influences on acquisition premium (e.g. time-varying factors including the overall state of the economy, "merger waves", etc.) that would vary over time. Acquirer and Target Industry fixed effects are also included to control for industry-specific differences in valuation multiples, regulatory requirements, and industry structure. It should be noted that by employing strict fixed-effect methods, the sample size will be reduced due to the fact that there are instances where there are no additional acquisitions at the level of either industry or year. The model could not generate the within group variation necessary to produce estimates of variance for each instance. Thus, to

avoid complete collinearity and to preserve the unbiasedness of the standard errors calculated from the regression model, the econometric software used to run the regression automatically removes all "singletons" (i.e., individual transactions. Therefore, 222 is the size of the raw sample after screening; 199 is the number of cases that are included in a regression when using only the complete case data; and 156 represents the total number of cases used for estimating models that include both year and industry fixed effects.

Table 3 reports the principal diagnostic statistics for the baseline regression specification.

Table 3: OLS Diagnostic Tests & Model Validity

Statistical Test	Result Value	Threshold Criterion	Academic Interpretation
Multicollinearity (Max VIF)	8.580	Pass (Below 10.000)	No severe overlapping between independent variables.
Normality of Residuals (p-value)	<0.001	Large Sample (CLT applies)	Non-normal but valid due to Central Limit Theorem.
Heteroskedasticity (p-value)	0.121	Pass (Above 0.050)	No strong evidence of heteroskedasticity in the baseline model; robust standard errors are still used as a precaution.

Note: Diagnostics are based on the fully specified baseline H1 model with year, acquirer-industry, and target-industry fixed effects.

3.4. Econometric Model Specifications

For this study the multivariate ordinary least squares (OLS) regression model will be employed to estimate the impact of ESG factors on the acquisition premium. The basic form of a hypothesis testing regression model is shown below:

$$\begin{aligned}
 Premium_{i,t} = & \beta_0 + \beta_1 TargetESG_{i,t-1} + \beta_2 AcquirerESG_{i,t-1} + \sum_k \gamma_k Firm\ Controls_{k,i,t-1} \\
 & + YearFE_t + AcquirerIndustryFE_i + TargetIndustryFE_i + \epsilon_{i,t}
 \end{aligned}$$

To test the pillar-level specification in Hypothesis 2, the aggregate ESG measure is replaced by the three target ESG pillar scores:

$$\begin{aligned} Premium_{i,t} = & \beta_0 + \beta_1 TargetENV_{i,t-1} + \beta_2 TargetSOC_{i,t-1} + \beta_3 TargetGOV_{i,t-1} + \\ & \beta_4 AcquirerESG_{i,t-1} + \sum \gamma_k Controls_{k,i,t-1} + YearFE_t + AcquirerIndustryFE_i + \\ & TargetIndustryFE_i + \epsilon_{i,t} \end{aligned}$$

To specifically test resource heterogeneity (hypothesis 3) we estimate a version of the model that measures the absolute ESG difference between the two firms being merged

$$\begin{aligned} Premium_{i,t} = & \beta_0 + \beta_1 ESGDistance_{i,t-1} + \beta_2 TargetESG_{i,t-1} + \beta_3 AcquirerESG_{i,t-1} \\ & + \sum \gamma_k Controls_{k,i,t-1} + YearFE_t + AcquirerIndustryFE_i \\ & + TargetIndustryFE_i + \epsilon_{i,t} \end{aligned}$$

To test the strategic catch-up hypothesis, the following interaction specification is estimated:

$$\begin{aligned} Premium_{i,t} = & \beta_0 + \beta_1 TargetESG_{i,t-1} + \beta_2 AcquirerESG_{i,t-1} \\ & + \beta_3 DesperateACQDummy_{i,t-1} + \beta_4 (DesperateACQDummy_{i,t-1} \\ & * TargetESG_{i,t-1}) + \sum \gamma_k Controls_{k,i,t-1} + YearFE_t \\ & + AcquirerIndustryFE_i + TargetIndustryFE_i + \epsilon_{i,t} \end{aligned}$$

Where $Premium_{i,t}$ is the acquisition premium for deal i at time t , calculated relative to the target's stock price four weeks prior to the announcement date. $TargetESG_{i,t-1}$ and $AcquirerESG_{i,t-1}$ denote the lagged ESG scores of the target and the acquirer, respectively. $ESGDistance_{i,t-1}$ is the absolute difference between the target's and acquirer's ESG scores. In the pillar specification, $TargetENV_{i,t-1}$, $TargetSOC_{i,t-1}$, and $TargetGOV_{i,t-1}$ denote the target firm's lagged ESG pillar scores. In the interaction specification, $DesperateAcqDummy_{i,t-1}$ is a binary indicator for acquirers with low ESG ratings, and $DesperateAcqDummy_{i,t-1} \times TargetESG_{i,t-1}$ is the interaction term used to test whether the valuation effect of target ESG differs across acquirer types. $Controls_{k,i,t-1}$ represents the vector of financial and deal-specific control variables. $YearFE_t$, $AcquirerIndustryFE_i$, and $TargetIndustryFE_i$ denote year, acquirer industry, and target industry fixed effects, respectively. $\epsilon_{i,t}$ is the regression error term.

3.5. Dealing with Endogeneity: Propensity Score Matching (PSM)

As an additional test of sensitivity of the results regarding the ESG Distance to selection effects due to observable factors, we have employed propensity score matching (PSM). We used the absolute ESG Distance variable to divide all transactions into two categories (high and low distance) using the sample median. A Probit Model was developed using observable variables to predict being part of the "High ESG Distance" category. The data set was subsequently matched at the one-to-one level using nearest-neighbors for each transaction without replacement. The post-matching diagnostic tests showed significant imbalance for some covariates; therefore, we view the matched sample estimates with caution, and do not interpret them as sufficient to prove that no observable selection bias existed.

$$Treatment_i = \begin{cases} 1 & \text{if } ESG_Distance_i > \text{Median}(ESG_Distance) \\ 0 & \text{otherwise} \end{cases}$$

We then used a Probit Model to predict the probability that each transaction falls into the High ESG Distance category based on the set of observable firm and deal characteristics used in the modeling process.

$$\Pr(Treatment_i = 1) = \Phi(\alpha_0 + \sum \delta_k X_{k,i})$$

Where $X_{(k,i)}$ represents the specific characteristic and i represents the individual observation.

The improvements in PSM and fixed effects can help create more of an apples-to-apples comparison based on many observable variables, however, there are still potential issues with omitted variable bias or reverse causality that will remain after matching, and in the present sample, post-matching covariate balance remains imperfect. Therefore, the results should still be interpreted as conditional associations rather than definitive causal effects.

3.6. Research Strategy: The Deductive Logic

Beginning with an examination of the research strategy used in this study, the entire methodology is based on a deductive, quantitatively based model. The purpose of this deductive approach is to assess the validity and applicability of two viewpoints—the Stakeholder Value View and Shareholder Expense View, regarding the relationship between

ESG and M&A. In addition to these general purposes, the methodology has three levels of analysis. These levels are referred to as: Signal Layer, Relational Layer, and Strategic Layer.

- Firstly, the Signal Layer focuses on determining whether the Target Company's ESG ratings can serve as a quality indicator during the due diligence process, thereby reducing information asymmetry.
- Secondly, the Relational Layer focuses on assessing the impact of absolute ESG distance between the Target Company and Acquiring Company. More specifically, it will examine how far apart the companies' values are. This will help determine how well-suited the companies will be working together (corporate fit).
- Thirdly, the Strategic Layer will focus on the motives behind the acquisitions. It will specifically test whether lower ESG-rated acquiring firms are willing to pay a "legitimacy premium" to create a positive sustainability image for themselves.

Chapter 4: Empirical Findings

In this chapter, we present the empirical results of our multivariate OLS regressions as well as of the PSM analysis that are intended to provide evidence for the four basic hypotheses. Across the reported analyses, all models include the full set of financial and deal-level controls, while fixed effects are introduced progressively depending on the specification.

4.1 Descriptive Statistics

While the initial screened sample included 222 deals, missing values across certain mandatory financial control variables and ESG-specific data reduced the usable regression samples to between 156 and 199 observations, depending on the model specification.

Prior to performing the main regression models, summary statistics were calculated to evaluate the center tendency and distribution of the data sample. The summary statistics for the variables used in the models are shown in Table 4. To prevent excessive influence from outlier values or measurement error on the analysis, all continuous financial variables were winsorized at the 1st and 99th percentiles.

Table 4: Descriptive statistics of Key variables

	Mean	Median	SD	Min	Max
Acquisition Premium	0.27	0.23	0.25	-0.17	1.20
Target ESG Score	0.37	0.34	0.18	0.05	0.84
Acquirer ESG Score	0.46	0.43	0.22	0.04	0.88
Absolute ESG Distance	0.18	0.15	0.14	0.00	0.64
Target Firm Size (Log)	7.84	8.00	1.45	3.74	11.5
Acquirer Firm Size (Log)	8.60	8.58	1.35	5.58	12.3
Target Leverage	0.28	0.28	0.22	0.00	1.00
Acquirer Leverage	0.30	0.29	0.21	0.00	0.88
Target ROA	0.01	0.03	0.14	-0.76	0.25
Acquirer ROA	0.03	0.04	0.10	-0.51	0.22
Target Market-to-Book	2.24	1.82	3.79	-14.84	15.71
Acquirer Market-to-Book	3.85	2.32	5.73	-5.28	36.07
Target Run-Up	0.02	0.02	0.13	-0.29	0.40
Relative Size	0.72	0.57	0.63	0.04	3.54

Note: All return-like variables, including Acquisition Premium and Target Run-Up, are reported in decimal form.

Figure 1: Distribution of Absolute ESG Distance

Density curve shows the spread of cultural gaps between targets and acquirers

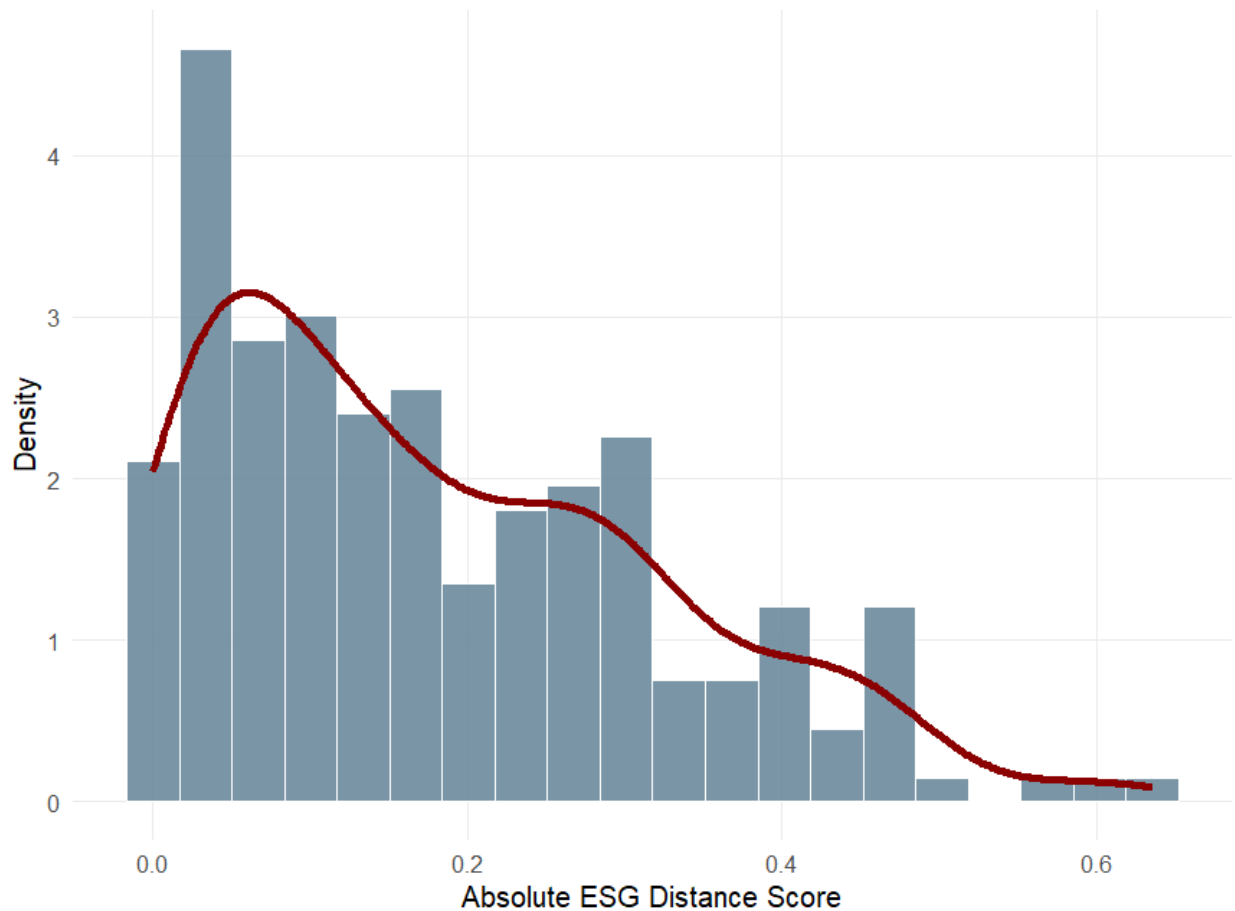


Figure 1: Distribution of Absolute ESG Distance. The density curve illustrates the spread of the absolute cultural and sustainability gaps between target and acquiring firms in the sample.

4.2. Correlation and Multicollinearity

To determine if there were any correlations among the independent variables, a Pearson correlation matrix was constructed to identify possible relationships. A table (Table 5) was also created to present the Pearson correlation coefficient values for all independent variables. The Variance Inflation Factor (VIF) was then determined for each independent variable. There were no VIFs that exceeded a value of 10 for any of the independent variables. As such, it can be concluded that no significant multicollinearity occurred within the models. Therefore, we could confidently report that there was little to no risk of inconsistent coefficients as a result of multicollinearity.

Table 5: Correlation Matrix

	Premium	TGT_ESG	ACQ_ESG	ESG_Dist	ACQ_Size	Run UP	ACQ_MtB	Relative Size
Premium	1	0.030	-0.040	0.135	-0.169	0.351	0.148	0.027
Target ESG	0.030	1	0.447	-0.144	0.247	-0.022	0.090	0.070
Acquiror ESG	-0.040	0.447	1	0.381	0.364	-0.035	-0.029	-0.139
ESG Distance	0.135	-0.144	0.381	1	0.081	-0.027	-0.007	-0.005
Acquirer Size	-0.169	0.247	0.364	0.081	1	-0.044	-0.071	-0.251
Run UP	0.351	-0.022	-0.035	-0.027	-0.044	1	0.080	-0.132
Acquirer Market to Book	0.148	0.090	-0.029	-0.007	-0.071	0.080	1	0.099
Relative Size	0.027	0.070	-0.139	-0.005	-0.251	-0.132	0.099	1

Note: A Pearson correlation matrix of the dependent variable and selected key regressors is reported in Table 5.

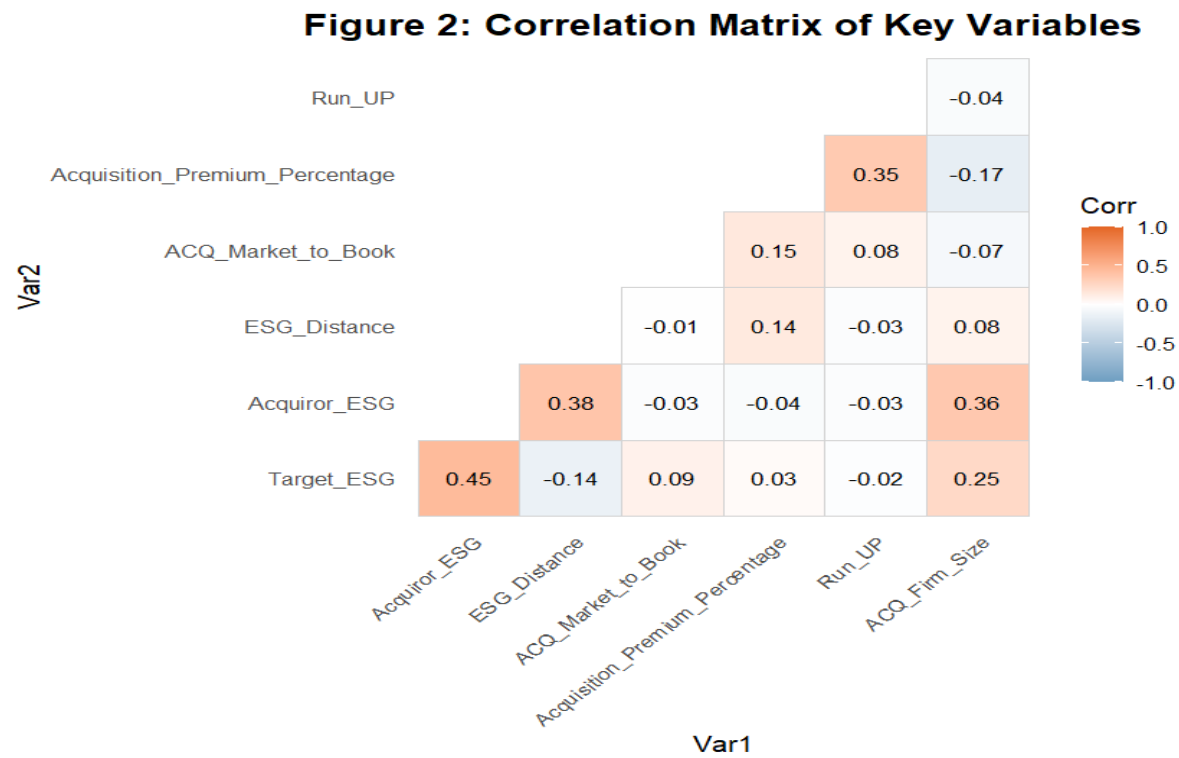


Figure 2: Pearson Correlation Heatmap of Key Variables. The lack of high-density color blocks (correlation approaching 1.0) among the independent variables visually confirms the absence of severe multicollinearity, validating the stability of the OLS coefficients.

Table 6: Univariate Analysis (High vs. Low Cultural Distance)

	High ESG Distance (N=99)		Low ESG Distance (N=100)		Diff. in Means	P-Value
	Mean	Std. Dev.	Mean	Std. Dev.		
Premium	0.292	0.238	0.241	0.259	-0.051	0.151
Target ESG	0.358	0.172	0.388	0.193	0.030	0.249
Acquirer ESG	0.523	0.226	0.394	0.201	-0.129	<0.001
Acquirer Size (Log)	8.642	1.321	8.558	1.294	-0.084	0.168

Note: Transactions are classified as **High ESG Distance** or **Low ESG Distance** based on whether their absolute ESG Distance is strictly greater or less than or equal to the sample median. The table reports group means, and the far-right column reports the p-value from a standard two-sample t-test of the difference in means (Low – High)

Principal Regression Findings

4.3. Assessing Hypothesis 1: The Quality Signal Hypothesis

The base-case regression model assesses the independent effect of target firm ESG performance on the acquisition premium. In the base-case regressions, the estimated coefficient for Target ESG is -0.114 and is not statistically significant (SE = 0.171). Since the coefficient is not statistically significant, there is insufficient evidence to support the hypothesis that an increase in pre-acquisition ESG performance of target firms is associated with an independent increase in the M&A premium. Hence, Hypothesis 1 was not supported by the data. Therefore, based upon the results of this study, Hypothesis 1 cannot be accepted and rejected because the data do not indicate that an increase in ESG performance at the time of a merger or acquisition will be associated with an increased acquisition premium in and of itself.

4.4. Assessing Hypothesis 2: The Pillar Salience Hypothesis

In Model H2, the overall ESG Score is broken into its components to determine which individual pillar drives valuation. While the coefficients for the Environmental (-0.075), Social (-0.090), and Governance (0.093), the pillars were individually found to be not statistically significant, none of the individual pillar coefficients are statistically significant in

the reported specification. As such, Hypothesis 2 was also rejected based upon these findings. Therefore, we can propose that none of the target's pillars Environment, Social or Governance, have a significant impact on the premium paid by the buyer.

4.5. Testing Hypothesis 3, ESG Distance, Acquisition Premiums, and the Alternative Resource-Heterogeneity Interpretation:

Hypothesis Three suggested a negative relationship between ESG Distance and Acquisition Premiums. On the one hand, under the culture-clash hypothesis, a larger difference in ESG capabilities will lead to higher integration costs for both firms; therefore, we would expect acquisition premiums to decrease. The results of our research did not support this hypothesis.

Our regression models indicated a positive coefficient for ESG Distance, and positive coefficients were found across all three major specifications, with statistical significance at the 5% level in the first two models and marginal significance at the 10% level in the fully specified fixed-effects model. In our "raw gap" model, the coefficient on ESG Distance is 0.286*, which implies that a 0.10 increase in ESG Distance is associated with an increase of approximately 0.0286 in the acquisition premium, equivalent to about 2.86 percentage points, statistically significant at the 5% level. When we added year dummies as controls to our model, the coefficient for ESG Distance remained positive at 0.327* and was also statistically significant. Finally, when we added industry dummies as controls to our model, the coefficient for ESG Distance remained positive at 0.300+ and remained marginally significant. Overall, the results indicate a positive association between ESG distance and acquisition premiums in the sample used in this study. Therefore, Hypothesis Three cannot be supported as originally stated. The findings are contrary to what would have been anticipated using a simple culture clash or integration friction paradigm. As such, the results are more supportive of a resource-heterogeneity explanation for the findings, in which buyers perceive ESG differences between themselves and their targets as possible sources of learning opportunities, resources to be transferred between the two firms, or synergies.

In order to determine if the positive ESG Distance finding could be due to some type of observable selection bias, Propensity Score Matching (PSM) was conducted. As in the original regression analysis, the PSM-matched sample estimates were positive and

statistically significant. For the PSM sample without fixed effects, the estimated coefficient for ESG Distance was 0.291* and was statistically significant. With respect to the PSM sample that includes year and industry fixed effects, the estimated coefficient for ESG Distance was 0.300* and was statistically significant. Overall, these PSM matched-sample results show that the positive ESG Distance coefficient remains present after matching. Therefore, the results indicate that the positive relationship identified previously using OLS regression still exists. However, supplementary robustness evidence shows that the positive coefficient remains after matching, although the matching results do not establish that observable selection bias was eliminated.

Finally, we tested robustness by replacing our standard measure of absolute ESG Distance with a multidimensional version, the Jaffe Distance. In that case, the estimated coefficient for Jaffe Distance was -0.101, with a standard error of 0.128, and was thus not statistically significant. These results fail to confirm that buyers price multidimensionally defined cultural alignment better than they price the aggregate size of an ESG gap. Rather, based on our results, bidders appear to react more strongly to large-scale ESG dissimilarities rather than category-specific levels of similarity and dissimilarity. Also, while the Jaffe measure captures multiple dimensions of a company's corporate social responsibility profile, because our standard ESG Distance measure is absolute rather than directional, it measures the absolute degree of difference between two companies' profiles regardless of direction. So, the measure provides no information about which company has the better ESG capabilities.

Taken altogether, our findings from our primary regressions, our secondary PSM analyses, and finally from our alternative distance-based robustness test indicate that our data do not support the negative Hypothesis 3 prediction; instead, our findings are more consistent with an alternative interpretation where ESG differences are viewed as possessing potential strategic value for mergers and acquisitions pricing purposes.

Figure 3: The Impact of ESG Distance on M&A Premiums

Positive trend line indicates a premium paid for higher cultural/ESG distance

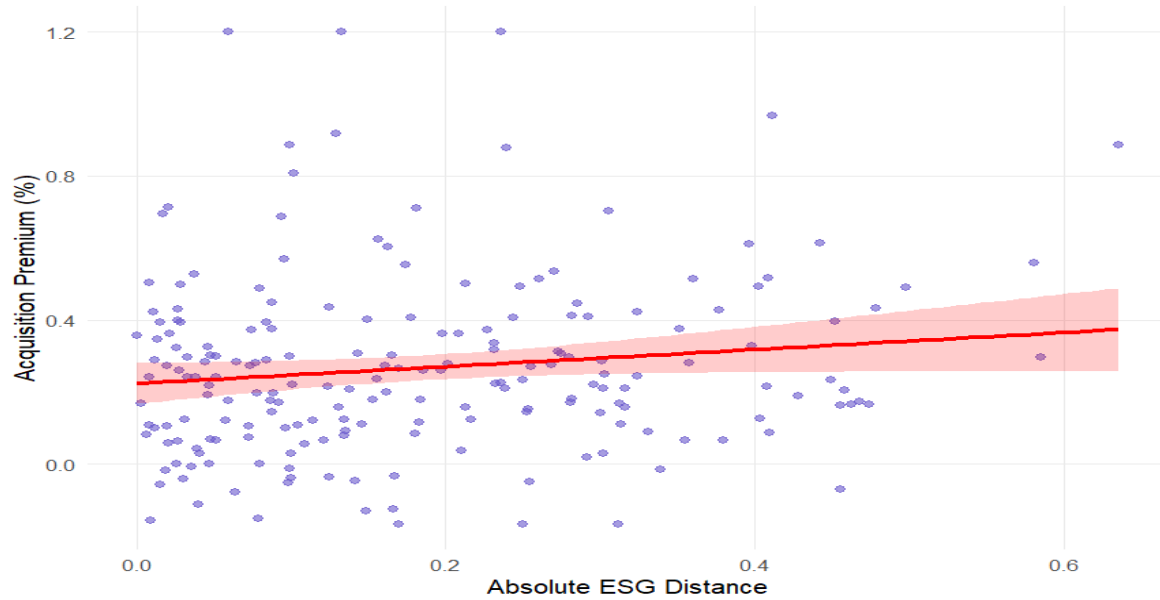


Figure 3: The positive red trend line illustrates the positive association between ESG Distance and acquisition premiums.

Figure 4: M&A Premiums by ESG Distance Groups

Deals with above-median ESG distance command visibly higher premiums

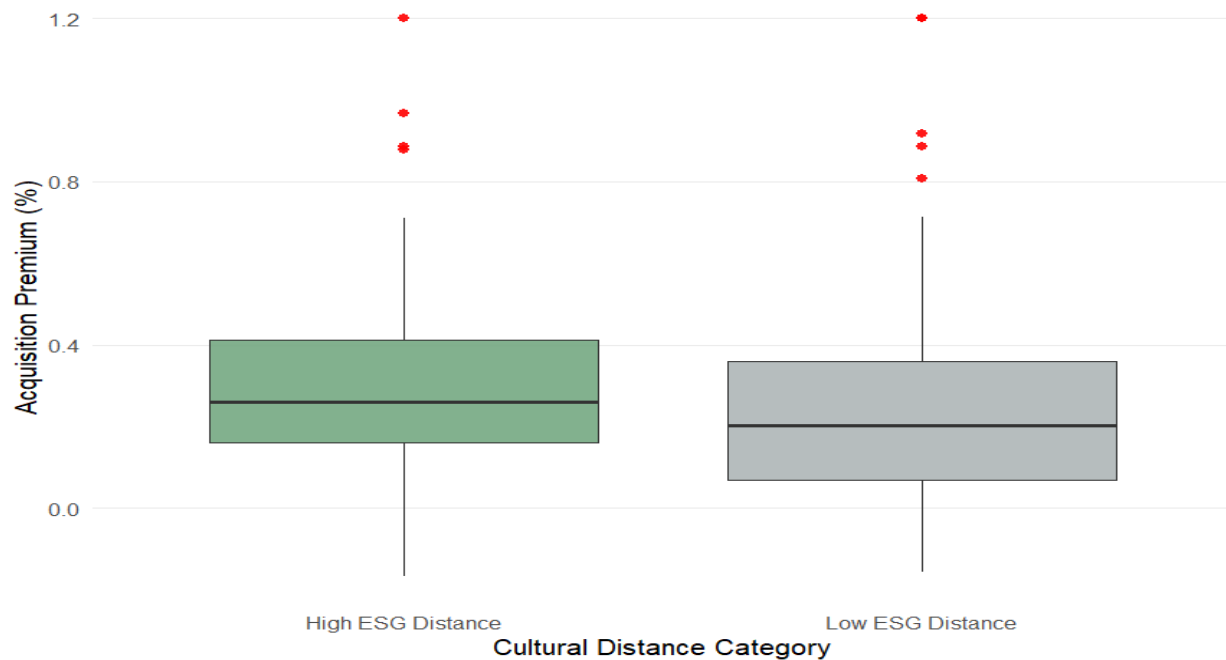


Figure 4: M&A Premiums by ESG Distance Groups. Categorizing the sample into above-median and below-median groups reveals that deals with a high ESG distance command visibly higher acquisition premiums, further supporting the synergistic value of capability transfer.

4.6. Testing Hypothesis 4: The "Strategic Catch-Up" Hypothesis

The “Strategic Catch-Up” Hypothesis in Model H4, the primary variable of interest (Desperate Acquirer Dummy x Target ESG) was found to have an estimate of -2.317^* , a standard error of 1.092, and was statistically significant at the 5 percent level. Thus, contrary to what was predicted in Hypothesis 4, the estimates indicate that the positive valuation effect associated with high levels of sustainability of the target company is lower when acquired by companies whose pre-deal ESG performance is relatively poor.

The estimate for the Desperate Acquirer Dummy coefficient alone was 0.191^+ with a standard error of 0.096 and marginally significant at the 10 percent level. Since this model included an interaction term, it would be incorrect to interpret the dummy coefficient without considering its impact relative to the level of target ESG. When considered in conjunction with the interaction term, there is no evidence supporting the strategic catch-up or reputation repair hypotheses. In fact, there appears to be some indication of the opposite; i.e., that companies who possess poor ESG performance before making acquisitions will not pay higher premiums for target companies possessing strong sustainability characteristics.

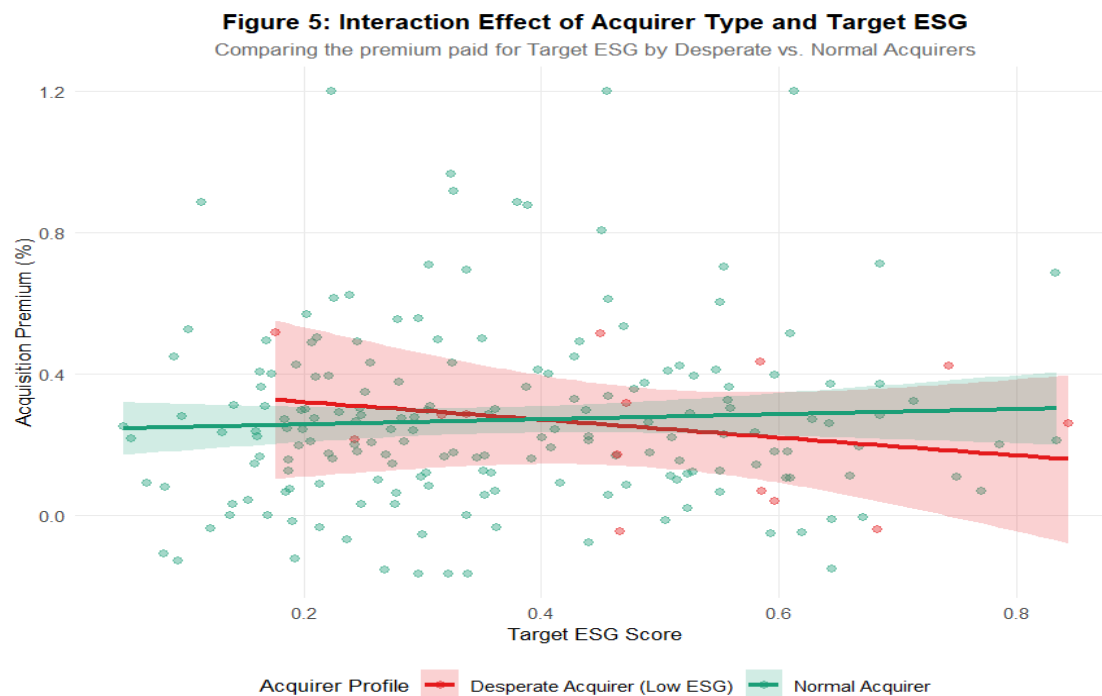


Figure 5: The estimated interaction pattern indicates that the relationship between target ESG and acquisition premiums is weaker, and potentially more negative, for acquirers classified in the threshold corresponding to 25 on the original 0–100 scale of pre-deal ESG performance.

Main Results: The Evolution and Impact of ESG Metrics on M&A Premiums

	H1 (Quality)	H2 (Pillars)	H3 (Raw)	H3 (Year FE)	H3 (I+Y FE)	H4 (Desperate)
Target ESG	-0.114 (0.171)					-0.096 (0.168)
Acquirer ESG	0.075 (0.129)	0.064 (0.127)				0.054 (0.131)
Acquirer Size	0.459 (0.509)	0.485 (0.532)	0.276 (0.353)	0.313 (0.322)	0.376 (0.457)	0.465 (0.515)
Target Size	-0.482 (0.404)	-0.529 (0.419)	-0.460 (0.308)	-0.423 (0.287)	-0.456 (0.388)	-0.474 (0.406)
Acquirer Leverage	-0.058 (0.130)	-0.045 (0.135)	0.041 (0.098)	0.007 (0.112)	-0.058 (0.122)	-0.076 (0.128)
Target Leverage	-0.117 (0.112)	-0.110 (0.112)	0.028 (0.084)	-0.001 (0.088)	-0.081 (0.108)	-0.124 (0.116)
Acquirer ROA	-0.025 (0.264)	-0.027 (0.271)	-0.341 (0.240)	-0.286 (0.249)	-0.026 (0.258)	-0.096 (0.261)
Target ROA	0.029 (0.308)	0.073 (0.307)	-0.066 (0.225)	-0.053 (0.225)	0.007 (0.305)	0.051 (0.293)
Acquirer Market to Book	0.007** (0.003)	0.007* (0.003)	0.005* (0.002)	0.006** (0.002)	0.005* (0.002)	0.008** (0.003)
Target Market to Book	-0.008 (0.007)	-0.008 (0.007)	-0.004 (0.005)	-0.004 (0.005)	-0.008 (0.007)	-0.007 (0.007)
Acquirer Cash Holdings	-0.233 (0.149)	-0.234 (0.157)	-0.022 (0.138)	-0.041 (0.149)	-0.245 (0.149)	-0.250+ (0.150)
Run UP	0.497** (0.185)	0.464* (0.183)	0.662*** (0.164)	0.669*** (0.158)	0.500** (0.180)	0.477** (0.179)

Main Results: The Evolution and Impact of ESG Metrics on M&A Premiums

	H1 (Quality)	H2 (Pillars)	H3 (Raw)	H3 (Year FE)	H3 (I+Y FE)	H4 (Desperate)
Relative Size	0.047 (0.087)	0.061 (0.094)	0.084 (0.066)	0.090 (0.061)	0.033 (0.076)	0.039 (0.088)
All Cash Deal	-0.038 (0.115)	-0.043 (0.116)	-0.019 (0.069)	-0.087 (0.106)	0.011 (0.108)	-0.035 (0.115)
Cross Border	0.058 (0.057)	0.058 (0.056)	0.076+ (0.042)	0.073+ (0.042)	0.060 (0.056)	0.054 (0.058)
Same Industry	-0.084 (0.135)	-0.093 (0.143)	-0.018 (0.041)	-0.017 (0.043)	-0.134 (0.099)	-0.088 (0.136)
Target ENV		-0.075 (0.131)				
Target SOC		-0.090 (0.143)				
Target GOV		0.093 (0.111)				
ESG Distance			0.286* (0.115)	0.327* (0.132)	0.300+ (0.170)	
Desperate x Target ESG						-2.317* (1.092)
Desperate Acq Dummy						0.191+ (0.096)
Num.Obs.	156	156	199	197	156	156
R2	0.653	0.658	0.248	0.306	0.671	0.667
R2 Adj.	0.344	0.338	0.186	0.176	0.385	0.354

+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001

4.7. Robustness Checks and Alternative Measurements

Table R1: Alternative Measurement of Cultural Distance

	Standard ESG Distance (No FE)	Jaffe Distance (No FE)
ESG Distance	0.286*	
	(0.115)	
Acquirer Size	0.276	0.355
	(0.353)	(0.343)
Target Size	-0.460	-0.534+
	(0.308)	(0.295)
Acquirer Leverage	0.041	0.045
	(0.098)	(0.098)
Target Leverage	0.028	0.018
	(0.084)	(0.086)
Acquirer ROA	-0.341	-0.318
	(0.240)	(0.238)
Target ROA	-0.066	-0.048
	(0.225)	(0.236)
Acquirer Market to Book	0.005*	0.005+
	(0.002)	(0.003)
Target Market to Book	-0.004	-0.004
	(0.005)	(0.005)
Acquirer Cash Holdings	-0.022	-0.024
	(0.138)	(0.140)
Run UP	0.662***	0.645***

	Standard ESG Distance (No FE)	Jaffe Distance (No FE)
	(0.164)	(0.168)
Relative Size	0.084	0.097
	(0.066)	(0.066)
All- Cash- Deal	-0.019	-0.082
	(0.069)	(0.068)
Cross Border	0.076+	0.073
	(0.042)	(0.045)
Same Industry	-0.018	-0.018
	(0.041)	(0.042)
Jaffe Distance		-0.101
		(0.128)
Num.Obs.	199	199
R2	0.248	0.225
R2Adj.	0.186	0.161

+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001

Table R1: Alternative Measures for Measuring Distance (Standard Distance vs. Jaffe Distance)

A number of additional robustness analyses have also been conducted to determine whether the main ESG Distance result is affected by model specification or variable measurement. In addition to assessing the sensitivity of the results to the inclusion of year and industry fixed effects, the baseline OLS model without fixed effects has been compared with both more stringent models (i.e., those with year and industry fixed effects). The estimated coefficient

on Absolute ESG Distance is consistently positive and remains largely unchanged (moving from 0.291* in the no-fixed-effects model to 0.300* in the year- and industry-fixed-effects model), suggesting that the observed positive association between ESG Distance and acquisition premium cannot be attributed solely to either general year-specific differences or industry-specific differences.

It is necessary to note, however, that it would be inappropriate to interpret these comparisons too broadly. Because the fixed-effects specifications effectively reduce the size of the estimation sample relative to the no-fixed-effects models, increases in R-squared may not necessarily indicate that a specific proportion of "unobserved market variance" has been explained. While this is the primary focus of the robustness check, the fact that the sign and approximate magnitude of the ESG Distance coefficient are consistent across alternative model specifications supports confidence in the stability of the main ESG Distance finding.

Additional robustness checks involved analyzing an alternate distance metric. As shown in Table R1, when the aggregate absolute ESG Distance measure used in the previous tables is replaced with the multidimensional angular distance measure known as Jaffe Distance, the estimate for the coefficient on the new distance metric is negative (-0.101) and is not statistically significant at conventional levels ($SE = 0.128$). Therefore, while neither of these findings provides definitive support for either measure, it can be concluded that the aggregate ESG Distance measures appear to be more informative than the multi-dimensional angular-distance measures in terms of being able to explain the variation in the dependent variable in the sample studied.

4.8. Addressing Endogeneity and Selection Bias

Table R2: Propensity Score Matching Regression (With Fixed Effects)

	PSM Matched Sample (FE)
ESG Distance	0.300*
	(0.129)
Acquirer Size	0.376
	(0.401)
Target Size	-0.456
	(0.343)
Acquirer Leverage	-0.058
	(0.125)
Target Leverage	-0.081
	(0.106)
Acquirer ROA	-0.026
	(0.244)
Target ROA	0.007
	(0.202)
Acquirer Market to Book	0.005
	(0.003)
Target Market to Book	-0.008
	(0.008)
Acquirer Cash Holdings	-0.245
	(0.165)
Run UP	0.500***
	(0.144)
Relative Size	0.033

	PSM Matched Sample (FE)
	(0.072)
All- Cash- Deal	0.011
	(0.212)
Cross Border	0.060
	(0.049)
Same Industry	-0.134
	(0.141)
Num.Obs.	156
R2	0.671
R2Adj.	0.385

+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001

Note: The reduction in observations in the matched fixed-effects specification reflects the combined effect of matching restrictions, missing values, and the inclusion of year and industry fixed effects, which reduce usable variation in some deal cells.

Table R3: Propensity Score Matching (PSM) Regression (No Fixed Effect)

	PSM Matched Sample (No FE)
ESG Distance	0.291*
	(0.114)
Acquirer Size	0.280
	(0.280)
Target Size	-0.463+
	(0.255)
Acquirer Leverage	0.038
	(0.091)
Target Leverage	0.030
	(0.085)
Acquirer ROA	-0.346+
	(0.185)

PSM Matched Sample (No FE)

Target ROA	-0.068
	(0.140)
Acquirer Market to Book	0.006+
	(0.003)
Target Market to Book	-0.004
	(0.005)
Acquirer Cash Holdings	-0.024
	(0.140)
Run UP	0.653***
	(0.133)
Relative Size	0.085+
	(0.049)
All- Cash- Deal	-0.019
	(0.232)
Cross Border	0.077+
	(0.039)
Same Industry	-0.019
	(0.037)
Num.Obs.	198
R2	0.248
R2Adj.	0.185

+p < 0.1, *p < 0.05, **p < 0.01, ***p < 0.001

4.9. Propensity Score Matching (PSM) Regression Estimates

Tables R2 and R3 contain sample regression estimates of a matched sample from propensity score matching (PSM). In addition to the estimates in these tables, Appendix Figure A2 and Appendix Table A3 provide covariate balance diagnostics by means of standardized mean differences for comparison purposes. These diagnostics show an improvement in covariate balance through matching. However, substantial imbalance remained for several economically important variables, including acquirer market-to-book, target profitability, run-up, and firm size measures. Thus, these PSM results should be viewed as supplementary robustness tests rather than definitive evidence that treatment and control samples became fully comparable on observables.

4.10. Control Variables

Acquirer Market to Book was found to be positive and statistically significant across all three models (i.e., 0.007** ($p < .01$) in H1; 0.006** ($p < .01$) in H3 year fixed effects). The results are consistent with previous studies on mergers and acquisitions, indicating that companies with high market-to-book ratios and strong growth expectations will generally pay a slight premium to acquire other companies.

4.11. Summary of Empirical Findings

Empirical results indicate no statistically significant relationship between either standalone target ESG performance (H1) or individual ESG pillar scores (H2) and acquisition premiums in this sample. Likewise, Hypothesis 4 is not supported. Additionally, the revised specification for use as an absolute threshold of 0.25 Indicator to measure Weak-ESG Acquirers does show a statistically significant relationship between Acquirer Weakness & Target ESG; however, it shows a Negative Relationship which indicates Low-ESG Acquirers are Not Paying Higher Premiums for More Sustainable Targets. Finally, we reject H3 because the estimated coefficient for ESG Distance was positive rather than negative. Across all model specifications, the absolute ESG gap between the buyer and the seller was positively associated with the acquisition premium, this finding is more consistent with an alternative resource-heterogeneity interpretation.

Chapter 5: Discussion and Conclusion

5.1. Discussion of the results

This section interprets the main findings of this thesis in relation to proposed hypotheses and literature on ESG effects on M&A Premium.

The results did not show statistically significant evidence of an independent ESG premium. It was determined that neither the target's total ESG rating nor each individual category E, S and G were significant in the reported models. This implies that, in this particular sample, the sustainability attributes of the target firm alone are insufficient to account for the variation in acquisition premiums paid by bidders. In short, it appears that bidders are not pricing target sustainability characteristics as independent, premium-generating features.

The most important finding of this thesis relates to ESG distance. Contrary to expectations, the coefficient for the absolute ESG distance variable was positive across the principal models. Therefore, in this sample, it can be inferred that larger ESG gaps between the bidder and target firm are associated with higher acquisition premiums. One possible interpretation of this is that bidders may view ESG differences not only as sources of integration risk but also as opportunities for complementary knowledge transfers, learning, etc. However, since the primary measure used in the analysis is an absolute ESG distance metric, it does not indicate whether one firm has a more favorable ESG profile than another.

This thesis found no support for the reputation repair hypothesis. In the revised H4 model, weak ESG bidders were identified via their overall ESG ratings prior to closing. The interaction term between weak ESG acquirer status and target ESG was negative and statistically significant. Thus, contrary to expectations regarding how weak ESG bidders will be willing to pay legitimacy premiums for highly sustainable target firms, this result suggests that the premium associated with a target's high level of ESG is lower when the acquiring company has poor ESG credentials at the time of announcing its intention to acquire. Possible explanations include that companies with poor pre-acquisition ESG profiles will have more difficulty achieving compatibility between themselves and target firms due to their own low levels of ESG-related assets; or that they will be less capable of extracting value from the target firm's existing sustainability-related resources.

5.2. Conclusion

This thesis investigated whether ESG characteristics contribute to explaining acquisition premiums in public acquisitions. A cross-regional dataset from North America and Europe included a series of OLS regression models controlling for various financial and deal-related factors. Additionally, the empirical analysis used OLS regressions with financial and deal controls, year and industry fixed effects, and supplementary propensity score matching as a robustness check.

No statistical significance was found to confirm that greater target ESG ratings are associated with greater acquisition premiums. No statistical significance was found for each Environmental Social & Governance Pillar rating when used as a separate predictor of premiums. As such, these results offer no evidence to confirm a simplistic "Green Premium" in this dataset.

However, the absolute ESG distance between the Acquirer and Target companies was positively related to Acquisition Premiums across the main specifications. The positive relationship is opposite of what was predicted under Hypothesis 3; thus, the data supports an alternative explanation that the ESG differences are viewed as opportunities for complementary capabilities/learning/capability transfers. However, since the primary ESG Distance metric is absolute (i.e., does not account for who possesses the superior ESG), the observed positive relationship cannot be used to infer which company had the superior ESG. Additionally, the results provided no support for the Reputation Repair Hypothesis. In the revised Specification H4 (Weak-ESG Acquirers), Weak-ESG Acquirers were defined as those Acquirers whose Lagged Overall ESG Score falls below a specified Low-ESG Threshold. For such Acquirers, the Interaction Term between their Weak-ESG Status and Target ESG was Negative and Statistically Significant. Thus, the Premium associated with Target ESG is Weaker (not Stronger) for such Acquirers. This is contrary to the notion that Weak-ESG Bidders Overpay for Sustainable Targets to Buy Legitimacy.

In total, this thesis provides evidence that ESG is Not Priced as a Simple Quality Signal in M&A Transactions. Rather, the data shows that ESG likely matters more Relationally, particularly through the Degree of ESG Difference Between the Two Firms. Thus, this thesis contributes to the literature by demonstrating that ESG Valuation in M&A is likely more Transaction-Specific than implied by the Traditional Stand-Alone Premium View.

5.3. Implications for Existing Literature

This thesis has numerous implications for the current research regarding ESG and M&A valuation.

The first implication is that the results contribute to the body of evidence (which is currently divided) on whether ESG can command a "standalone" premium in terms of acquisition pricing. In the sample analyzed, no statistically significant positive relationship was found between the target's overall ESG rating and/or individual pillar ratings and acquisition premiums. Therefore, the simple "green premium" hypothesis may not apply universally across different settings and may vary based on factors such as sample selection, variable construction and/or the nature of each transaction. In addition, the findings help explain why previous studies may have produced conflicting results.

A second contribution to the literature is demonstrated through the emphasis placed upon the relational aspects of ESG in M&A deals. The positive relationship observed between absolute ESG distance between the bidder and target and acquisition premiums suggests that ESG differences between these two firms possess economically relevant information beyond the standalone ESG quality of either firm. Furthermore, the positive relationship observed provides greater support for a "resource-heterogeneity" or "complementarities" perspective, whereas a "culture clash" perspective would have predicted a negative relationship. Although the "distance" measure used is an absolute measure, this evidence is indicative of the extent of ESG difference but does not indicate in which direction capabilities were transferred.

A third contribution to the literature demonstrating acquirer-side heterogeneity is provided through evidence illustrating that the price impact associated with a target's level of ESG varies depending upon the acquiring firm's pre-deal ESG standing. A negative and statistically significant coefficient was estimated for the interaction term between weak acquirer ESG status and target ESG. As such, the results do not lend credence to a notion that weak-ESG bidders consistently pay a "legitimacy premium" for their sustainable acquisitions. Rather, the results imply that the way in which an acquirer values a target's ESG in terms of pricing during an M&A transaction will be influenced by an array of acquirer attributes.

Collectively, the thesis suggests that ESG in M&A should not only be viewed from a target-level signal perspective. Instead, ESG may matter more through relational and transaction-specific mechanisms, particularly when the ESG profiles of both firms are considered jointly.

Chapter 6: Limitations and Future Directions for Research

6.1. Introduction to Limitations

Despite employing a thorough econometric approach, including year-and-industry fixed-effects, supplementary propensity score matching robustness checks, and calculating a four-week pre-announcement premium, all empirical work in corporate finance has inherent constraints due to data collection methods. Therefore, it is essential to identify and acknowledge these methodological and data-related constraints to maintain the integrity of the results.

6.2. Sample Size and Data Collection Restrictions

The most significant constraint for this study derives from the available data for measuring ESG. As nearly all sustainability metrics measured by databases such as Refinitiv/LSEG pertain to large, publicly traded corporations, the empirical sample consists entirely of such corporations. Therefore, the generalizability of the results regarding ESG Distance and Capability Transfer to smaller private-market acquisitions would be limited.

In addition to removing private target companies from the sample, as part of the initial empirical screening for this research project, traditional financial institutions and regulated utility firms were also removed. Some adjacent or infrastructure industries were classified differently across databases and were therefore included in the final sample due to ambiguities in data classification. Although Real Estate Investment Trusts (REITs) represent a significant portion of the final sample (11.56%), they were deliberately maintained because REITs' basic operational business model is to hold and manage physical real estate assets rather than engage in the complex lending, depository, and regulatory environments associated with traditional financial institutions. This exclusionary criterion was imposed in accordance with Zheng et al.'s (2023) methodology in their study, 'ESG Disclosure and Acquisition Premiums', in which they excluded financial and utility sector targets from consideration. This was done to minimize confusing variables associated with the unique reporting requirements and regulatory environments faced by these two industry groups (Tampakoudis & Anagnostopoulou, 2020). Additionally, limiting the sample to only those deals for which complete financial information and matching ESG scores were available greatly reduced the initial number of deals in the original empirical sample. Consequently, this restriction reduced

statistical power compared to other studies examining the full range of M&A activity.

6.3. Measurement/Metric Uncertainty

Another substantial limitation pertaining to this study relates to the use of third-party ESG ratings. Third-party ratings rely primarily on information disclosed by the corporation itself and therefore measure only what can be observed from those disclosures. Furthermore, third-party ESG ratings may fail to account for unobservable corporate cultural values that contribute to sustainability (Ozdemir et al., 2022; Tampakoudis & Anagnostopoulou, 2020). Although ESG scores have been widely adopted as an academic proxy for ESG performance, they do not account for unobservable sustainability characteristics.

There is also a recognized lack of transparency regarding the specific methodologies used by various rating agencies to calculate subcomponent weights or aggregate ESG scores (Teti & Spiga, 2023). Due to the absence of a universal standardization framework for assessing ESG attributes, using different rating agencies (e.g., Sustainalytics vs. MSCI KLD or Capital IQ) could result in a big varying degree of difference in the magnitude of ESG distance.

6.4. Methodological/Econometric Constraints

While we have conducted Propensity Score Matching (PSM) as a supplemental robustness test to address the problem of non-comparability based on observable characteristics between High-ESG-Distance and Low-ESG-Distance deal types, matching does not completely eliminate potential endogeneity due to unobservable factors or reverse causality in M&A pricing. Although the Post-Matching Balance Diagnostics indicated substantial remaining imbalance in multiple covariates after matching. These PSM-based estimates should be viewed with caution and represent no evidence that all the Observable Selection Bias has been eliminated. In other words, there will always exist an Omitted Variable which influences both the decision of a firm to reveal its ESG characteristics and its price when acquired by another company. Furthermore, the H4 Results appear to be highly dependent upon how one operationally defines Weak-ESG Acquirers by rating platforms. As such, the H4 results may be sensitive to how weak-ESG acquirers are operationally defined. Indicating that conclusions regarding reputation-repair motives depend on how the low-ESG group is defined.

Although year- and industry-fixed effects help control for differences across firms arising from time or sector, they do not fully account for all unobserved firm-level heterogeneity.

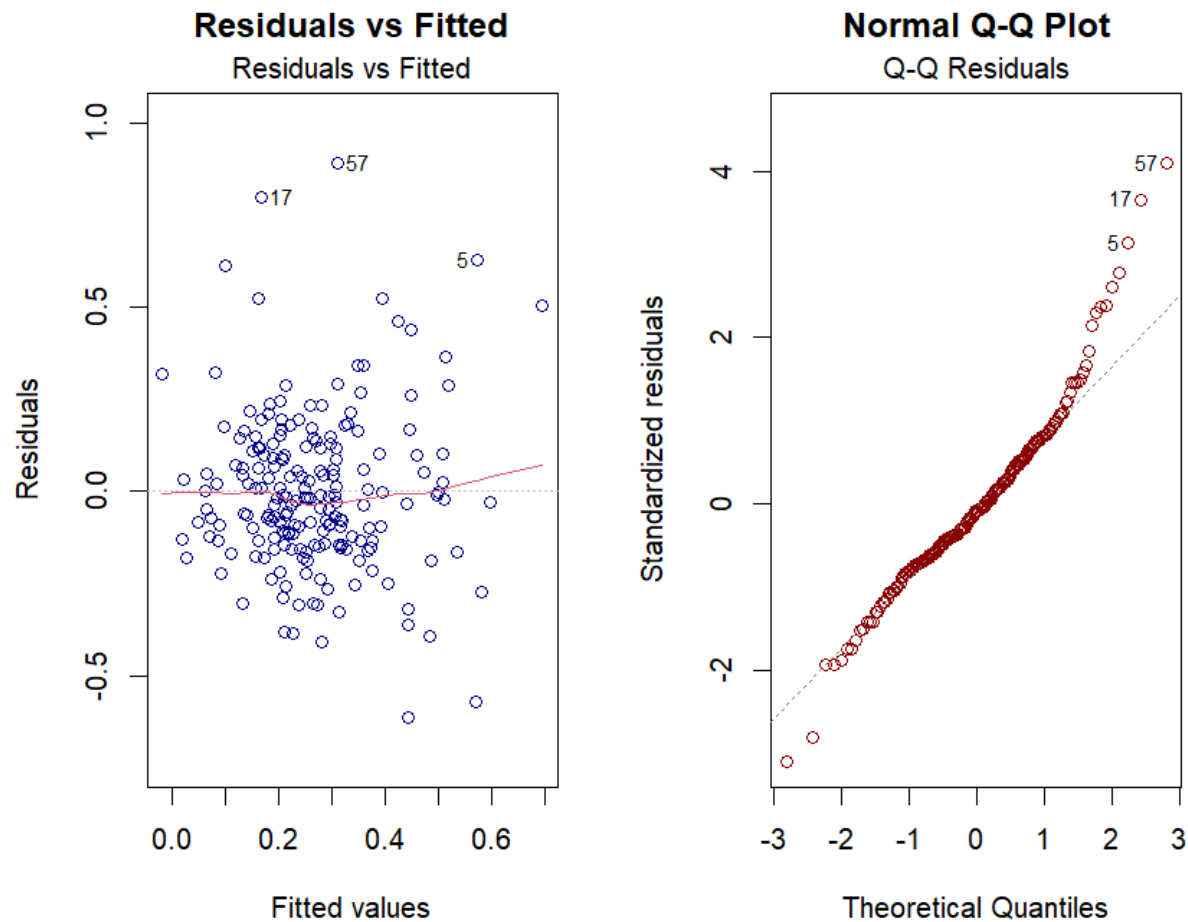
Moreover, because there are only 156 observations in the sample used to estimate the primary models, the use of strict year- and industry-fixed effects creates a degree of over-parameterization, as evidenced by the large difference between the R-squared and Adjusted R-squared values in those models. In addition, matching an absolute distance metric with PSM presents inherent limitations. Because the 'High ESG Distance' treatment group includes both types of transactions (acquirer-superior and target-superior), the probit model predicting this high-distance status aggregates two fundamentally different strategic profiles, potentially introducing noise into the matched control group. In addition, market-to-book ratios can be unstable when book equity is very small or negative. Accordingly, those coefficients should be interpreted with caution. Finally, since this study examines only "control bids" (those in which the acquirer seeks to purchase more than 50% of the target), the acquisition premium includes an additional "control premium" (Gomes & Marsat, 2018). At this point, no general econometric model exists to isolate or estimate exactly how much of this control premium is included in each transaction. Consequently, estimating the total variance of each transaction's bid premium becomes even more difficult (Gomes & Marsat, 2018).

6.5. Areas for Future Research

The above-mentioned areas for future research include numerous avenues through which researchers can extend upon these previously identified areas of limitation. First, in addition to exploring private M&A transaction data as an extension of previous studies' samples and employing new methods for analyzing the relationship between corporate culture and resource heterogeneity based on written analyses (i.e., Management Discussion and Analysis (MD&A) text), future research could also explore how sensitive the Resource Heterogeneity hypothesis is to alternative sources of ESG data and different scoring methodologies.

Second, future research should dig further into the subcomponents of ESG categories. Specifically, research could investigate the extent to which specific types of ESG controversy impact the acquisition premium paid during the negotiation phase, and the subsequent integration costs experienced after merger completion. For instance, does one type of ESG controversy (e.g. human rights abuses) alone affect the premium paid, or do others like environmental spills have different impacts? This represents an area suitable for development within both the sustainable finance and strategic management literature.

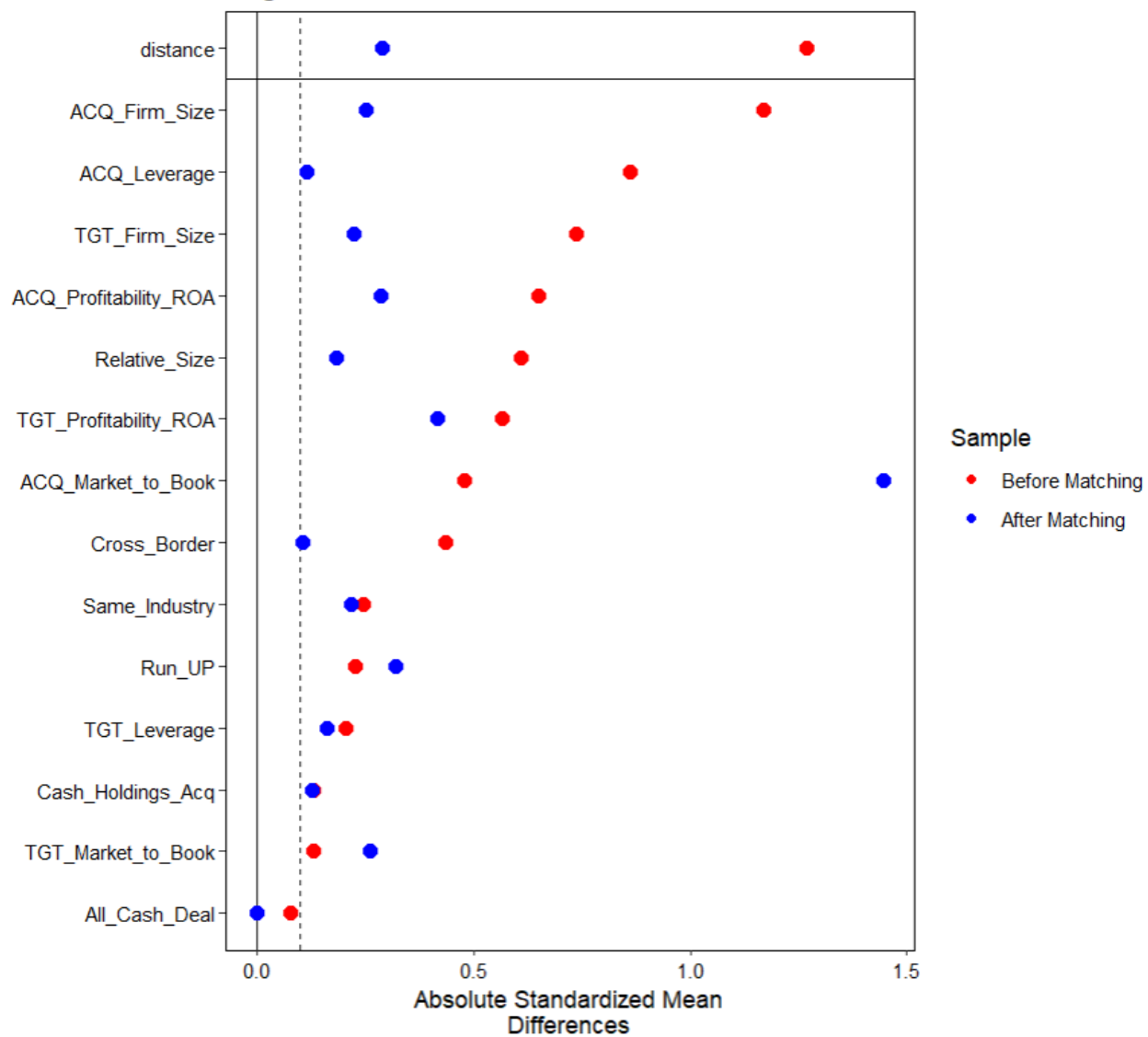
Appendix



Appendix A1: Overall, the Residuals vs. Fitted plot does not show a clear pattern, which is consistent with the assumption of constant variance (homoskedasticity). The Normal Q-Q plot suggests there are deviations from normality in the extremes; these results are consistent with formal statistical testing for the residuals. Given the sample size and the use of robust standard errors, the assumption of normality is relaxed to an asymptotic one; therefore, our inference is based on asymptotic rather than exact normality assumptions.

Appendix A2: Covariate Balance Before and After Matching

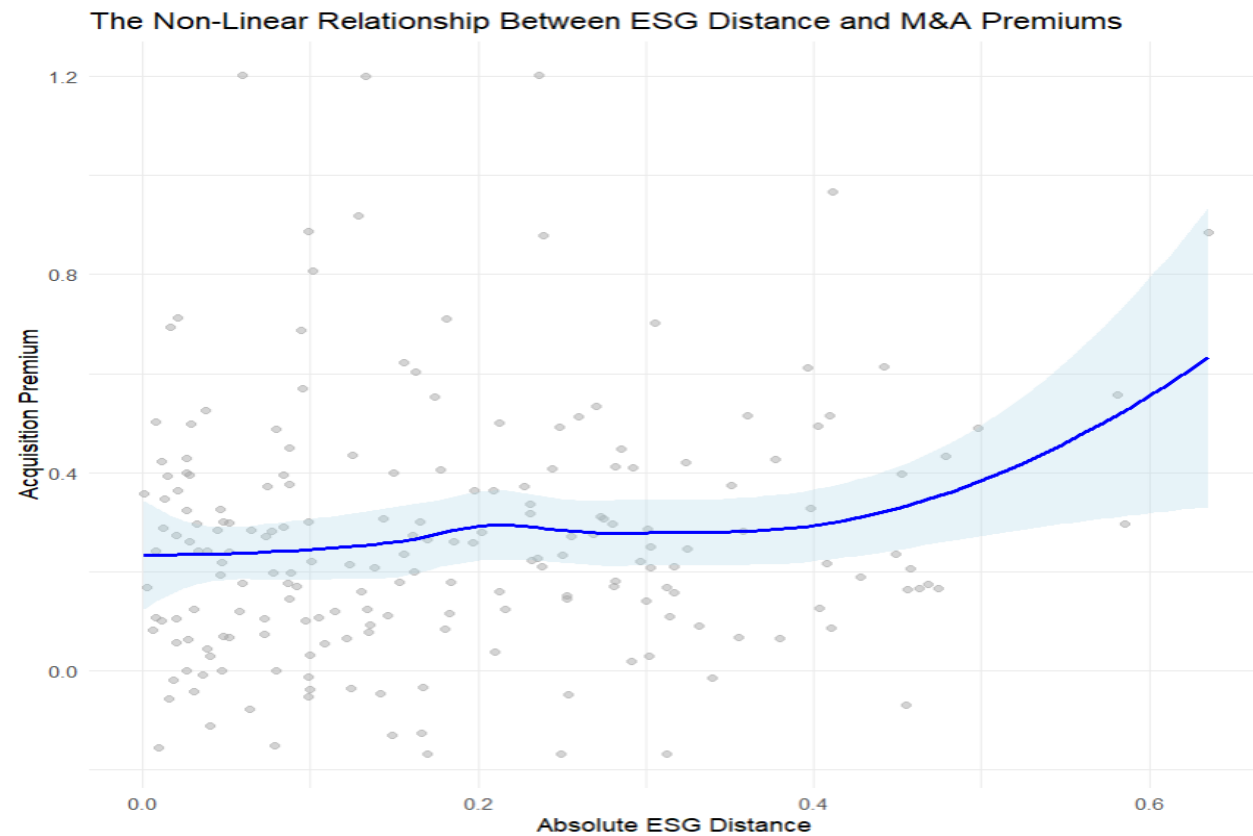
Figure X: Covariate Balance Before and After PSM



Appendix A3: Standardized Mean Differences Before and After Matching

Covariate Balance Before and After Matching						
Variable	Mean_Treated_Before	Mean_Control_Before	SMD_Before	Mean_Treated_After	Mean_Control_After	SMD_After
ACQ_Firm_Size	10.085	8.465	1.171	10.085	9.735	0.253
TGT_Firm_Size	9.053	7.840	0.736	9.053	8.685	0.224
ACQ_Leverage	0.204	0.316	-0.862	0.204	0.189	0.115
TGT_Leverage	0.249	0.290	-0.207	0.249	0.216	0.162
ACQ_Profitability_ROA	0.068	0.026	0.651	0.068	0.087	-0.285
TGT_Profitability_ROA	0.050	0.007	0.565	0.050	0.081	-0.417
ACQ_Market_to_Book	4.019	6.741	-0.479	4.019	12.230	-1.445
TGT_Market_to_Book	-2.407	-5.832	0.129	-2.407	4.531	-0.261
Cash_Holdings_Acq	0.104	0.116	-0.132	0.104	0.093	0.127
Run_UP	0.001	0.022	-0.226	0.001	0.030	-0.321
Relative_Size	0.546	0.887	-0.610	0.546	0.443	0.184
All_Cash_Deal	0.000	0.006	-0.079	0.000	0.000	0.000
Cross_Border	0.421	0.206	0.436	0.421	0.368	0.107
Same_Industry	0.632	0.750	-0.245	0.632	0.737	-0.218

Appendix A4



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