



UNIVERSITY OF GOTHENBURG  
SCHOOL OF BUSINESS, ECONOMICS AND LAW

# **The role of ESG in cross-border M&As: A study of developed market acquirers and emerging market targets**

An empirical analysis exploring the impact of pre- and post-merger ESG performance on acquisition premiums and long-term firm performance

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## **Abstract**

This thesis examines the impact of Environmental, Social, and Governance (ESG) factors on cross-border mergers and acquisitions (M&As) involving developed market acquirers and emerging market targets. Utilizing a dataset of 206 transactions spanning from 2002 to 2023, we assess the influence of ESG performance on acquisition premiums and the long-term performance of acquiring firms.

Our findings reveal that higher ESG scores of target companies is correlated with increased acquisition premiums, suggesting that these targets are perceived as lower risk- and more valuable investments. However, the effect of pre-merger ESG score of the target on post-merger ESG performance of the combined entity are inconclusive, underscoring the complexities of integrating ESG practices. Furthermore, while strong ESG profiles positively impact stock prices one year post-acquisition, this effect is moderated by broader economic and strategic factors. This research underscores the strategic importance of ESG considerations in the M&A context within emerging markets and highlights the need for further investigation into sector-specific impacts and the sustained effects of ESG practices.

## **Keywords**

ESG, CSR, M&A, Acquisition premium, Stakeholder Theory, Emerging Markets

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## Introduction

In the last decade, finance has markedly pivoted from short-term profit maximization towards embracing sustainable business practices. This evolution reflects an increased recognition of finance as a pivotal element in supporting sustainability and achieving social and environmental objectives (World Finance 2023). This strategic embrace of sustainability has influenced the Merger and Acquisition (M&A) landscape, a sector traditionally perceived as a barometer for economic vitality. The growing influence of Environmental, Social, and Governance (ESG) considerations in these transactions marks a shift from traditional valuation methods to those reflecting broader stakeholder interests. Since ESG's rise to prominence in 2005 (International Finance Corporation 2005), corporations have been under increasing pressure from investors and regulatory instances to improve and transparently report ESG commitments. This evolution has been paralleled by an uptick in M&A activity, particularly in the growing economies of emerging markets (Refinitiv 2021), reflecting their expanding influence in the global economic landscape.

Despite this trend, there remains a notable lack of empirical research focused on the ESG aspects of M&A in these regions. While existing research are biased toward developed markets and acquirer-centric perspectives, studies that examine emerging markets often limit their scope to a select few specific countries, failing to encompass the entire spectrum of emerging economies (Cho et al. 2022; Rahman and Wu, 2023). Hence, emerging markets, with their distinct characteristics and challenges, have not been thoroughly examined. This oversight is notable given the vital role that emerging markets are expected to play in the realms of global finance and sustainable development. As these markets become more integral and influential within the industry, their active participation in M&A activities, especially those influenced by ESG considerations, is crucial for achieving long-term success and strategic growth in corporate ventures worldwide (BCG 2023). This thesis, therefore, addresses a critical gap by investigating the effects of ESG factors on M&A premiums and the subsequent performance of merged entities, particularly in acquisitions where developed market firms target companies in emerging markets.

Building on the methodologies developed by Anagnostopoulou and Tampakoudis (2020) and Nguyen et al. (2024), this thesis explores whether the positive correlation between the post-merger ESG performance of acquirers and the pre-merger ESG excellence of targets observed in previous studies also holds when firms from developed markets acquire targets in emerging markets. While inspired by these methodologies, our study examines if this positive relationship persists regardless of whether the target's ESG score is initially superior. We explore the potential for mutual learning and improvement between the parties, even if the target might have lower overall ESG scores but excels in specific aspects. Additionally, this approach is further utilized to explore how a target's ESG performance influences M&A purchase premiums, as well as to analyse the relationship between the merged entity's stock price and the superior pre-merger ESG performance of the target pre acquisition. To address these research questions, this thesis utilises a dataset encompassing 206 M&A transactions across 34 emerging market countries spanning from 2002 to 2023. An Ordinary Least Squares (OLS) regression analysis is performed, controlling for financial and deal-specific variables. This study aims to provide new insights into the strategic role of ESG in M&A valuations and to explore its broader implications for market performance and stakeholder value. The analysis has produced significant insights.

Firstly, ESG scores of target firms in emerging markets are positively correlated with acquisition premiums, indicating a valuation premium for ESG-compliant firms. Secondly, the data does not support a clear influence of pre-merger ESG metrics on the long-term sustainable performance of the acquiring firm. This underscores the complexity of ESG factors in M&A outcomes and suggests that immediate market perceptions of ESG excellence may not consistently predict long-term performance enhancements post-merger. Lastly, the analysis indicates that while the acquirer's post-merger improvement in ESG performance does not significantly influence stock price, acquiring a target with robust ESG credentials does positively impact the acquirer's value. Specifically, a higher ESG score of a target firm relative to the acquirer at the time of the merger announcement is significantly correlated with an increase in the acquirer's stock price one year post the transaction. These insights confirm the complexity of ESG factors and their varied influence on post-merger performance and valuation.

The evidence presented challenges the traditional view of M&As as primarily financially driven, highlighting the strategic importance of sustainability in the valuation and long-term success of cross-border mergers. The results are partly in alignment with Cho et al. (2022), also investigating cross borders deals but within the Korean Stock Price Index, suggesting that superior ESG engagement has an positive impact on business performance of cross-border deals supporting stakeholder theory. The results from this study and those by Cho et al. (2022) concur that ESG factors influence performance in cross-border transactions. However, as highlighted in both reports, one cannot conclusively attribute these changes solely to ESG factors. There are multiple elements influencing this relationship, and while ESG contributes to the value chain, it is not the sole driver. This research suggests that acquisitions may be one of several factors that facilitate the transfer of sustainable business practices across borders, thus contributing partially to the global pursuit of sustainability.

The structure of this paper is outlined as follows: Section 2 reviews relevant research for each hypothesis and develops the research questions. Section 3 introduces the methodology applied while section 4 provides a description of the sample utilised. Section 5 presents the results, analysis, and limitations of the study. Finally, Section 6 concludes the paper and discusses future research opportunities.

## 2. Literature and hypothesis development

This chapter provides a review of previous research related to the impact of ESG performance on cross-border M&As. Firstly, it presents existing literature on how the sustainability commitments of target companies impact the control premium in acquisitions. Secondly, it examines the lasting effects of target firms' sustainability commitments on the sustainable performance of the merged entity post-acquisition. Finally, the chapter reviews the influence of sustainable performance on post-M&A stock performance. Additionally, after each literature review section, hypotheses are developed based on the reviewed studies. Previous research explores various dimensions of sustainable performance, including corporate social responsibility (CSR) and environmental, social, and governance (ESG) factors. In this study, these terms are used interchangeably, consistent with their usage in the existing literature.

### 2.1 Influence of target sustainable performance on M&A control premium

The influence of sustainable practices on financial outcomes has been extensively explored within the field of finance, reflecting the increasing significance of sustainability in recent years (World Economic Forum 2022). This section aims to review the existing literature on how sustainability commitments of target firms may impact the control premium in acquisitions. Within the scope of M&A, the control premium refers to the surplus amount expended to obtain control of a company, typically representing the aggregate value of benefits obtained from acquiring a sufficient number of shares to secure a controlling stake (Nenova 2003). Dyck and Zingales (2004) suggest that this premium arises primarily from the potential increase in value under new management and the synergies achieved from gaining control.

However, existing literature yields mixed findings regarding the impact of sustainable practices on deal premiums. On the one hand, several empirical studies suggest a positive correlation between robust ESG practices of the target company and higher acquisition premiums, primarily attributed to the reduced risk profile associated with the target entity in alignment with stakeholder- and signalling theory. The research conducted by Binesh et al. (2021) proposes that firms with substantial Corporate Social Responsibility (CSR) engagement command higher acquisition premiums, attributing this phenomenon to reduce the information asymmetry inherent in such deals by indicating potential value, as acquirer's

often lack complete information about target firms. Sustainable practices offer advantages such as improved reputation, financial performance, and risk reduction, which serve as valuable signals to bidders. Consequently, this may result in a higher purchase price for the target firm due to the anticipated post-acquisition benefits. In emerging markets, CSR's influence is notably significant for target firms. Abdel and Sisira (2012) contend that companies in emerging economies face greater information asymmetry compared to those in mature markets due to weaker legal frameworks and suboptimal information-sharing practices, undermining financial agreements' integrity. Hence, this underscores the significance of Binesh's et al. (2021) findings for emerging market targets.

Gomes and Marsat (2018) extend the discussion in alignment with stakeholder theory, by asserting that CSR performance is a valued component in M&A contexts, positively associated with bid premiums. The study examines both the general correlation between CSR and bid premiums and the specific relationship in cross-border transactions. Their findings align with Binesh et al. (2021), indicating that enhanced CSR and environmental performances are linked to increased acquisition premiums, with social performance particularly important in cross-border deals due to cultural and regulatory differences. Similarly, Qiao and Wu (2019) assert a similar positive association in cross-border deals, treating CSR as a strategic asset. However, they note that institutional and cultural distances, as well as prior acquisition frequency in the target nation, moderate this effect. Higher differences prompt acquirer's to value CSR more for reducing information asymmetry, while extensive acquisition history in the target nation reduces the strategic value of CSR.

On the other hand, numerous studies challenge the positive correlation by presenting findings of non-significant and negative relationships. Erben et al. (2022) conduct a comprehensive examination into the effects of CSR on M&A premiums, utilizing an international dataset that encompasses the sustainability performance of both target firms and acquirer's. The study reveals that the sustainability performance of neither acquirer's nor targets independently exerts a significant influence on the premiums disbursed during transactions. Erben et al. (2022) yields empirical support for the assertions made by André and Yen (2019), affirming the complex association between sustainability practices and M&A premiums. It further substantiates the notion that this relationship transcends the explanatory frameworks provided

by either shareholder or stakeholder theories alone, thus indicating a complexity that demands a more nuanced analytical approach. Erben et al. (2022) suggests that the cost-benefit dynamics related to enhanced CRS engagement at the target level may either neutralize on another or that CSR considerations do not significantly influence investors decisions regarding premiums. This aligns with the initial insights of Aktas et al. (2011), who argue that investors are aware of the SRI behaviour of targets and that stock market prices already incorporate a premium for sustainable practices.

Despite conflicting findings in previous research, two main reasons support the expectation that sustainable practices have a positive effect on control premium when acquiring emerging market targets. Firstly, sustainable practices serve as valuable signals to bidders, mitigating information asymmetry inherent in such deals and indicating potential value to acquirer's who often lack complete information about target firms. Secondly, the increased importance of sustainability in recent years, underscores the growing recognition of the benefits associated with sustainable practices, which may translate into higher acquisition premiums for firms demonstrating strong CSR engagement in emerging markets. The paper identifies the first hypothesis in the following manner:

*Hypothesis 1: ESG performance of target firms in emerging markets positively influences the acquisition premium offered by acquirer's from developed countries.*

## 2.2 Influence of target sustainable performance on post-M&A sustainable profile

The scope of existing research within this area is limited in the context of emerging economies, with most available papers concentrates on broader regions, especially within developed economies. However, this section aims to review the existing academia landscape on the lasting effects of target firms' sustainability commitments on the sustainable performance of the merged entity post-acquisition.

Aktas et al. (2011) propose that acquiring a target with robust sustainable performance should result in positive abnormal returns for the acquirer in terms of ESG commitments, potentially attributable to learning from the target's sustainable practices. This aligns with the prevailing

consensus in the existing literature, indicating a positive correlation between the sustainable commitments of the target firm pre-transaction and the sustainable performance of the merged entities post-transaction. Nguyen et al. (2024) suggests that the positive relationship is attributed to resource dependence and organizational learning theories. Resource dependence theory posits that M&A enable firms to access external resources, shaping their behaviour after the merger. Successful integration of a target's sustainable practices can lead to sustained ESG-related efficiencies over time. Additionally, organizational learning theory underscores that effective integration of ESG practices allows acquirer's to adopt and leverage the target's sustainability-driven values, ultimately improving their own ESG scores following the merger (Aktas et al. 2011; Nguyen et al. 2024).

Anagnostopoulou and Tampakoudis (2020) and Rahman and Wu (2023) validate the findings by Aktas et al. (2011) and Nguyen et al. (2024), indicating their substantial relevance to European and Chinese M&A transactions, respectively. The studies suggest that acquiring targets with superior ESG performance compared to acquirer's pre-merger enhances the post-merger ESG performance of acquirer's. This integration of target ESG practices into acquirer's operations demonstrates a proactive acceptance of integrating sustainable principles into their fundamental business strategies, affirming acquirer's tendency to learn from the sustainable practices of their targets.

The literature suggests that the most significant improvement in acquirer's post-merger sustainability scores is often observed in the social and environmental pillars (Aktas et al. 2011). Nguyen et al. (2024) confirms Aktas et al. (2011) findings regarding the environmental category, highlighting environmental commitments to mitigate the heightened visibility and external pressure faced by firms with poor environmental performance, which is compounded by regulatory requirements and media attention. Such pressures, perceived as urgent to address, prompt firms to prioritize improvements in environmental practices through M&As rather than social and governance aspects.

Furthermore, the literature examines whether the relationship is influenced by the type of deal. Nguyen et al. (2024) find that although acquiring targets with higher ESG scores cross-

border weakens the relationship, acquirer's still achieve ESG improvement post-merger with targets from the same industry. Notably, when both cross-border transactions and targets within the same industry are considered, the relationship is significantly stronger. This highlights the advantage for acquirer's in achieving significant ESG improvements post-merger under such circumstances, emphasizing the importance of industry familiarity and shared cultural contexts in successful acquisitions and sustainable practices integration.

These findings substantiate the notion that acquiring targets with strong sustainable performance presents an alternative approach to bolstering acquirer's post-merger ESG ratings, both when targeting developed- and emerging companies. Under the assumption that acquirer's possess the capability to assimilate and apply their targets' ESG practices, it follows that acquiring firms could enhance their post-merger ESG ratings by targeting companies with robust sustainability commitments. This thesis assumes that this relationship holds true even if the target's overall ESG score is not superior. The potential for mutual learning and improvement exists due to the differing market conditions and the ability of each party to excel in specific ESG parameters within each measurable pillar. Grounded in this premise, the paper identifies the second hypothesis in the following manner:

*Hypothesis 2: The pre-merger ESG performance of target firm positively impacts the long-term value of the merged entity.*

### 2.3 Influence of target sustainable performance on post-M&A stock performance

The influence of sustainable performance on the post-M&A stock performance is a nuanced and intricate topic that has garnered considerable attention in academic literature. Existing research in this domain presents a divergent array of perspectives, with some studies aligning with stakeholder theory while others resonate with agency theory. Deng et al. (2013) provide compelling evidence supporting the stakeholder value maximization view, indicating that acquirer's with robust CSR standards tend to yield superior long-term stock returns post-merger compared to those with lower CSR standards. This positive association can be attributed to the likelihood of sustainable investments augmenting firms' intangible assets. Although the full value of sustainable commitments may not be immediately reflected in the stock price at the time of the merger announcement, it often manifests in improved merger

performance over time, resulting in enhanced long-term stock returns for high CSR acquirer's.

Similarly, Aktas et al. (2011) and Anagnostopoulou and Tampakoudis (2020) provide further support for the positive impact of target firms' social and environmental commitments on acquirer abnormal returns and market value, respectively. These findings contribute significantly to the ongoing debate regarding the corporate value-enhancing effect of socially responsible practices in the context of M&A.

However, not all studies demonstrate positive relationships. Cellier and Chollet (2016) highlight specific value drivers and underscore the variability in the effects of social dimensions on acquirer market value. Additionally, Feng (2021) finds no statistically significant relationship between the target's ESG score and the acquirer's stock price change post-M&A deal. André and Yen (2019) further elaborate on the complexity of the relationship, emphasizing the influence of investors' agency cost concerns and governance mechanisms, particularly in emerging markets.

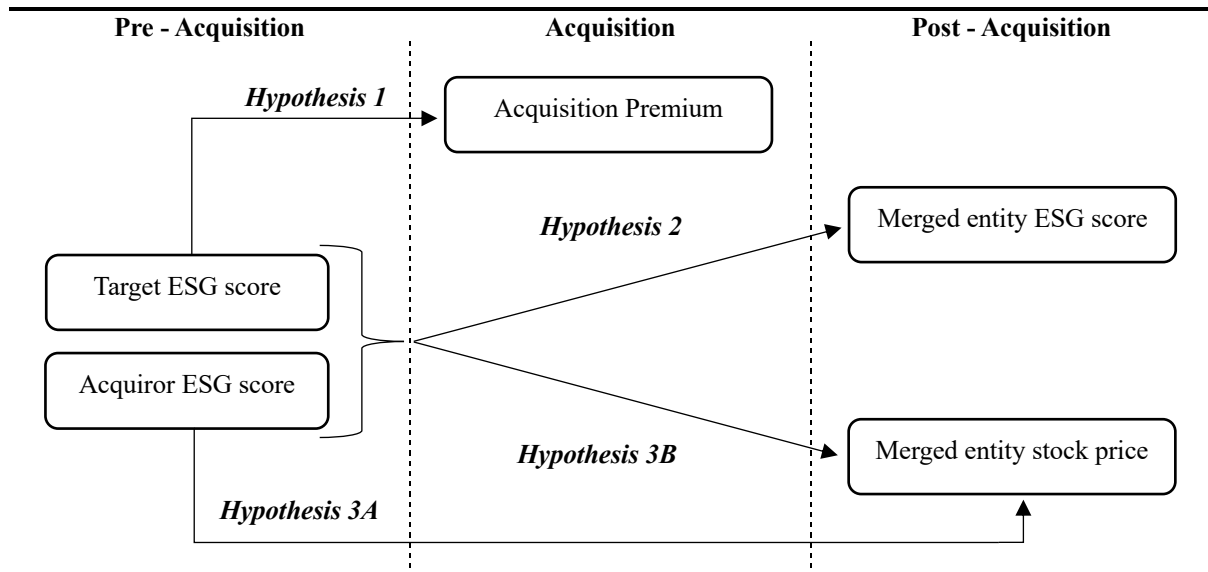
The regression analyses conducted in several studies suggest that the relationship between social ratings and firm value can be interpreted in terms of costs and benefits. Social ratings may positively impact firm value when perceived as a benefit, leading to increased cash flows, enhanced reputation, and reduced risk. Conversely, they may negatively impact firm value when perceived as a cost, resulting in decreased cash flows or reputation.

Given the significance of sustainability in M&A acquisitions, especially in emerging markets where agency problems are prevalent, the research question posits that improving the acquirer's ESG performance following a merger, coupled with the acquisition of a target with relative stronger ESG standings, amplifies the acquirer's overall value after the merger. Therefore, hypothesis suggests that the combined effect of enhanced ESG performance and the acquisition of socially responsible targets contributes positively to the acquirer's financial profile post-M&A. In light of this, the paper identifies the third hypothesis in the following manner:

*Hypothesis 3A: Improving the acquirer's ESG performance following a merger, positively influences the acquirer's stock price post-merger.*

*Hypothesis 3B) Acquiring a target with relatively higher ESG performance, positively influences the acquirer's stock price post-merger.*

Figure 1: Graphical illustration of the formulated hypotheses



The figure provides a visual representation of the developed hypotheses. The independent variable used to investigate *Hypothesis 2* and *Hypothesis 3B* is the ratio of the target's to the acquirer's ESG score pre-acquisition

### 3. Methodology

This chapter outlines the methodology applied to investigate the impact of ESG performance on acquisition premiums and post-merger outcomes in cross-border M&As. Firstly, it examines the relationship between ESG performance of emerging market targets and the acquisition premiums paid by developed market acquirers, utilizing multiple regression models to assess both overall and individual ESG pillar scores. Secondly, it explores the effects of pre-merger ESG scores on the post-merger sustainable performance of the acquiring firms, analyzing how the relative ESG standings between targets and acquirers influence subsequent ESG improvements. Thirdly, the chapter assesses the impact of ESG performance on acquirers' long-term stock prices post-acquisition, evaluating the influence of enhanced ESG scores and the ESG disparity between targets and acquirers. Finally, the chapter presents performed robustness and sensitivity tests conducted to evaluate the stability and reliability of the model outputs.

#### 3.1 ESG Performance and its impact on control premiums in M&A transactions

This section explores the relationship between ESG performance in emerging markets target companies and short-term shareholder value creation in developed countries during M&A activities, in alignment with *Hypothesis 1*. Specifically, it assesses how overall ESG scores (model 1) and individual Environmental (E), Social (S), and Governance (G) pillar scores (model 2a, 2b, and 2c) of emerging target firms influence the premium paid by acquiring firms originated developed market countries. True for all models defined in this section is that  $DS$  encompasses variables specific to the deal, while  $F$  covers the financial metrics of the target company (variable definitions is available in section 3.1.1) Moreover,  $\gamma$  and  $\delta$  are used to account for industry and time fixed effects, respectively, with  $\varepsilon$  representing the error term.

As this model examines the effect of ESG scores of target firms, the premium is defined in the following manner:

$$Premium_i = \frac{Offer\ price\ per\ share_i - Share\ price_{i,t-4\ weeks}}{Share\ price_{i,t-4\ weeks}} \quad Eq. (1)$$

The *offer share price per share* represents the price offered for each share by the acquirer at the time of the acquisition, and the *share price* represent the target company's trading share price four weeks prior to the announcement of the acquisition.

Model 1 explores the correlation between a target company's ESG performance and the acquisition premium it commands. Mathematically, this relationship is represented with the following OLS regression:

*Model 1:*

$$Premium_i = \beta_0 + \beta_1 ESG_i + \beta_2 DS_i + \beta_3 F_i + \gamma_i + \delta_i + \varepsilon_i$$

Model 2a, 2b and 2c investigate each specific aspect of a target company's ESG performance—represented by individual scores in environmental (E), social (S), and governance (G) pillars—influence on the acquisition premium. This is explored across three OLS regression equations:

*Model 2a:*

$$Premium_i = \beta_0 + \beta_1 Target\ E\ Score_i + \beta_2 DS_i + \beta_3 F_i + \gamma_i + \delta_i + \varepsilon_i$$

*Model 2b:*

$$Premium_i = \beta_0 + \beta_1 Target\ S\ Score_i + \beta_2 DS_i + \beta_3 F_i + \gamma_i + \delta_i + \varepsilon_i$$

*Model 2c:*

$$Premium_i = \beta_0 + \beta_1 Target\ G\ Score_i + \beta_2 DS_i + \beta_3 F_i + \gamma_i + \delta_i + \varepsilon_i$$

In the regressions analysing model 1, 2a, 2b, and 2c, the dependent variable (*Premium*) refers to the additional amount an acquiring company is willing to pay over the market value of the target company's shares and typically arises from the anticipated synergies that are expected to be realized following the transaction (Gaughan 2018). The premium is defined as the percentage discrepancy between the price offered by the acquiring company for the target firm and the market value of the target firm four weeks before the announcement day (Equation 1), following the methodology of Jost et al. (2021). Eckbo (2008) supports this methodology by advocating for a target stock price timeframe that minimizes pre-offer market speculation. He posits that a four-week period prior to the announcement effectively isolates the stock price from anticipatory fluctuations, offering a cleaner measure of the premium by

reflecting the target's market value without the distortion of takeover expectations. Moreover, the acquisition premium in M&A transactions can be significantly affected by the target's company's ESG performance, with higher scores potentially leading to higher premiums.

The independent variables in this study are represented as follows: regarding model 1, the *Target ESG Score* reflect the overall ESG performance of the target company, while for model 2 the *Target E Score*, *Target S Score* and *Target G Score* individually represent the performance of the target company in each specific ESG pillar. Testing both the individual pillars and the overall ESG score offers a dual perspective, providing a more nuanced understanding of ESG impacts. Examining each pillar separately allows for identification of specific impacts of each ESG component on the dependent variable which is crucial in determining which ESG aspect most significantly influences the outcome.

### 3.1.1 Control variables

The control variables are used to account for other factors that might influence the dependent variable aside from the primary independent variable (Stock and Watson 2015). Including these control variables aims to isolate the specific effect of the independent variables (*Target ESG Score*, *Target E Score*, *Target S Score* and *Target G Score*) of the dependent variable (*Premium*). The definition, abbreviation, rationale, and expected sign of each control variable on the acquisition premium are detailed in Appendix 2 and 3.

To refine and enhance the analysis, this study has controlled for variables related to the target's financial performance, including *Size* (log of total assets), *Leverage* (debt to total assets ratio), *Return on Assets* (net income before extraordinary items over total assets), *Price-to-Book Ratio* (share price to book value of equity), and *Investment Rate* (capital expenditures to total assets), all measured at the end of the year before the transaction.

Additionally, the study incorporates deal-specific factors to assess their influence on the acquisition premium, utilizing both continuous variables such as, *Deal Value* (log of transaction value), alongside dummy variables to highlight unique deal attributes. These dummy variables capture conditions such as a *Toehold* (whether the acquirer had a  $\geq 5$  percent stake pre-announcement), *Deal Advisors Target* (involvement of financial or legal advisors), *Multiple Bidders* (presence of competitive bidding), *Hostile* (opposition from the target's

management), and *Cash Financing* (use of cash as payment). By assigning a "1" to indicate the presence of these conditions, the study methodically dissects their contributions to M&A valuation, merging quantitative and categorical data to elucidate premium determinants.

Lastly, the study has controlled for *Year-* and *Industry-* fixed effects to account for year-, and target industry-specific characteristics that vary over time and across different industries (Martynova and Renneboog 2008; Mitchell and Mulherin 1996), hence affecting the premium.

## 3. 2 Post merger performance

### 3.2.1 Effects of pre-merger ESG scores on post-merger performance

*Hypothesis 2* examines the influence of pre-merger ESG metrics on merged firms' long-term value, suggesting that higher ESG performance before merging forecasts greater sustainability performance post-merger. Model 3 dive into the intricacies of this relationship. The dependent variable in this model is the change in the acquirer's ESG performance post-merger ( $\Delta Acquirer ESG_i$ ). This metric quantifies the relative improvement or decline in the acquirer's ESG scores from the time of the merger announcement to one year after the transaction. The formula for calculating this change is:

$$\Delta Acquirer ESG_i = \frac{Acquirer ESG_{t+1,i} - Acquirer ESG_{t,i}}{Acquirer ESG_{t,i}} \text{ Eq. (2)}$$

Model 3 seeks to quantify the effect of the ratio of the target company's ESG performance to that of the acquiring company at the time of the merger  $\left(\frac{Target ESG_{t,i}}{Acquirer ESG_{t,i}}\right)$  on the acquiring firm's ESG performance post-merger. This ratio represents the relative ESG standings, assessing whether the target's ESG benchmarks relative to the acquirer's influence the acquirer's subsequent ESG progress. Mathematically, this is explored with the following OLS regression:

*Model 3:*

$$\Delta Acquirer ESG_i = \beta_0 + \beta_1 \left(\frac{Target ESG_{t,i}}{Acquirer ESG_{t,i}}\right) + \sum \beta_k Controls + \gamma_i + \delta_i + \varepsilon_i$$

### 3.2.2 Assessing the impact of ESG on acquirer's stock price post-acquisition

*Hypothesis 3A* and *3B* posit that ESG factors significantly contribute to enhancing the value for acquiring firms. To investigate this, models 4a and 4b are structured to assess the influence of M&A on the acquirer's long-term performance from an ESG perspective.

In both models, the dependent variable, change in the acquirer's stock price post-acquisition ( $\Delta$  *Acquirer Stock Price*<sub>*i*</sub>), measures the percentage change in the acquirer's stock price from four weeks prior to the merger announcement to one year post merger. This metric serves as an indicator of the market's response to the merger, reflecting investors' perceptions of the merger's potential to create value.

$$\Delta \text{Acquirer Stock Price}_i = \frac{\text{Acquirer Stock Price}_{t+1\text{year},i} - \text{Acquirer Stock Price}_{t-4\text{weeks},i}}{\text{Acquirer Stock Price}_{t-4\text{weeks},i}} \text{ Eq. (3)}$$

Model 4a examines the potential for an acquirer's enhanced ESG performance to contribute to long-term value creation (*Hypothesis 3A*). It is hypothesized that an increase in the acquirer's ESG score positively affects its stock price over time, reflecting the market's valuation of sustainable practices. Mathematically, this relationship is represented with the following OLS regression:

*Model 4a:*

$$\Delta \text{Acquirer Stock Price}_i = \beta_0 + \beta_1(\Delta \text{Acquirer ESG}_i) + \sum \beta_k \text{Controls} + \gamma_i + \delta_i + \varepsilon_i$$

Model 4b evaluates the effect of acquiring a target with superior ESG performance on the acquirer's stock price over the long term (*Hypothesis 3B*). The model theorizes that an acquirer's stock price is positively affected by the ESG disparity between itself and the target at the time of the merger announcement, measured by the ratio of the target's ESG score to the acquirer's ESG score  $\left(\frac{\text{Target ESG}_{t,i}}{\text{Acquirer ESG}_{t,i}}\right)$ .

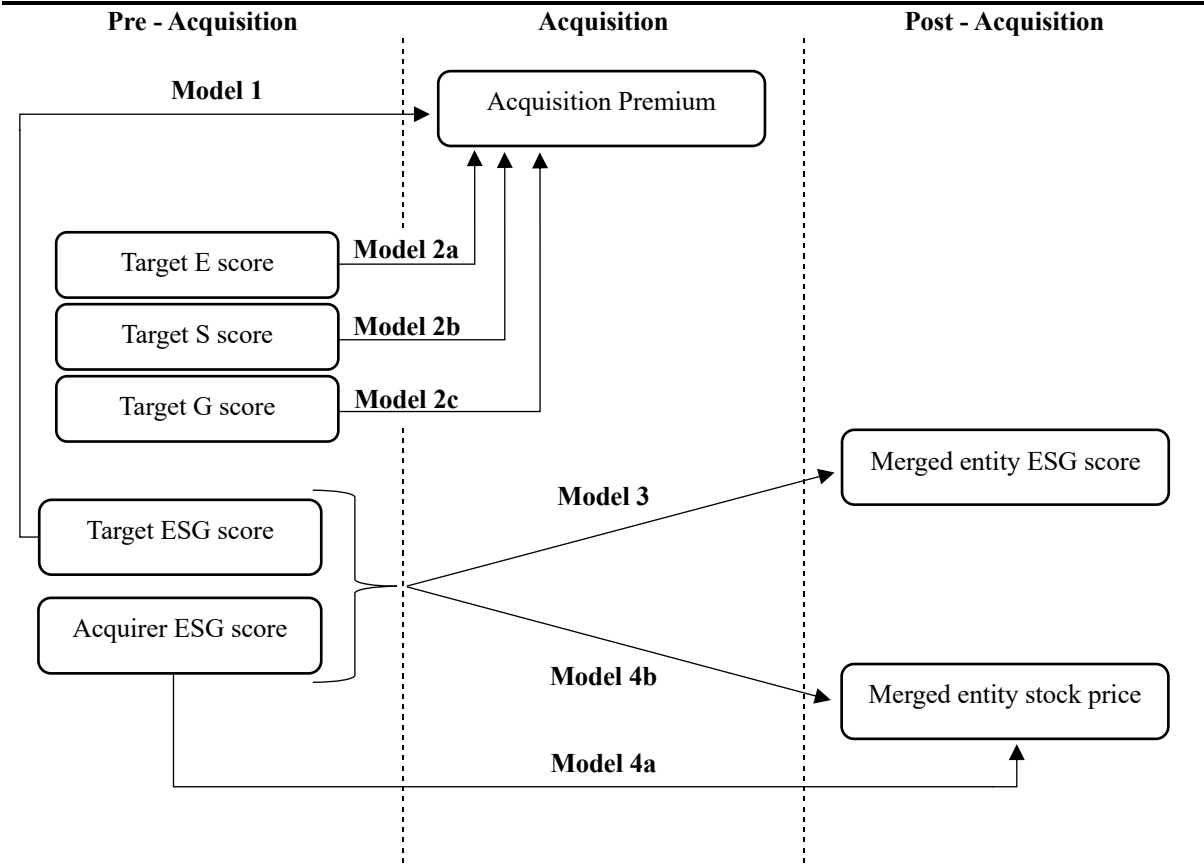
*Model 4b:*

$$\Delta \text{Acquirer Stock Price}_i = \beta_0 + \beta_1 \left(\frac{\text{Target ESG}_{t,i}}{\text{Acquirer ESG}_{t,i}}\right) + \sum \beta_k \text{Controls} + \gamma_i + \delta_i + \varepsilon_i$$

### 3.2.3 Control variables

In the regression analyses addressing *hypotheses 3 and 4*, a set of financial control variables are selected to account for the acquirer's economic state and its influence on the merger's outcome on both stock price and ESG Score. These variables include changes in *Size, Leverage, Revenue, Price-to-Earnings ratio, Return on Assets* and *Investment Rate* of the acquirer. Additionally, the study employs year and acquirer industry fixed effects ( $\gamma$  and  $\delta$ ) to control for temporal and sector-specific factors that could affect the results. The detailed definitions, formulas, rationales, and expected signs of each control variable are exhaustively delineated in Appendix 4 and 5. This ensures a robust analysis that accurately isolates the effects of the primary variables of interest on the post-merger performance metrics.

Figure 2: Graphical illustration of the empirical models



The figure provides a visual representation of the empirical models. The independent variable used in Model 3 and Model 4b is the ratio of the target's to the acquirer's ESG score before acquisition

## 3.3 Validity

### 3.3.1 Selection bias

Selection bias occurs when the sample used in research is not representative of the entire population, leading to biased results (Stock and Watson 2015). To mitigate the risk of selection bias in this research, it is ideal to utilize a random sampling method for the data selection. However, there is a limitation in the availability of ESG scores for all the entities involved in the M&A transactions under study, making the dataset used more selective and potentially less representative.

In this analysis, bootstrap methods are implemented as a robustness test to evaluate the reliability and generalizability of the results derived from two distinct datasets with relatively small sample sizes. Efron's bootstrap method, which uses random sampling with replacement, is particularly effective for generating multiple simulated samples from the original dataset. This methodology is particularly effective in providing better estimates than normal approximation for OLS regressions among other statistical approaches (Qumsiyeh 2013). When applying this method, 1000 resamples has been performed on each model and thereby enhancing the reliability of the empirical results. This sensitivity test strengthen the conclusions drawn about the impact of ESG performance on acquisition premiums and post-merger outcomes, enhancing robustness to potential selection bias and sample variability.

### 3.3.2 Heteroskedasticity

In regression analysis, heteroskedasticity means that the variance of error terms varies across different levels of the independent variable. To ensure the validity of regression, homoscedasticity is required, where the variance of error terms remains constant across all independent variable values. Hence, if heteroskedasticity is present, it can lead to biased estimates, incorrect standard errors, and invalid results (Stock and Watson 2015).

To address heteroscedasticity concerns, the study employs a technique that involves transforming variables using the natural logarithms of their values. To investigate the assumption further, Breusch-Pagan (1979) test for heteroskedasticity has been applied. This test regresses squared residuals, using the same independent variables as the main regression.

The test statistic is derived by multiplying the number of observations by the R-squared value and comparing it to a critical value from a chi-distribution at a 95 percent confidence level.

Based on the results presented in Appendix 7 there is evidence of heteroskedasticity in the models, meaning the variance of the errors is not constant across observations. Despite heteroskedasticity, OLS coefficients are still unbiased (White 1980). This study employs robust standard errors to correct for this, ensuring the reliability of our significance tests.

In model 4a and 4b heteroskedasticity is not detected. However, opting for robust standard errors can offer resilience against potential violations of the homoskedasticity assumption, representing a conservative approach to standard error estimation (Greene 2012). Hence, this study incorporates standard errors in all utilized regressions.

### 3.3.3 Multicollinearity

Multicollinearities represent another violation of the OLS assumptions and occurs when two or more independent variables in a regression model are highly correlated with each other, making it difficult to assess the individual effects of each independent variable on the dependent variable. Consequently, leading to unreliable estimates, increased standard errors and a greater difficulty in identifying statistically significant effects (James et al. 2013).

Multicollinearity will be analysed using a Variance Inflation Factor (VIF) test, which provide a numerical value for each independent variable that indicates how much its variance is "inflated" by the presence of other correlated independent variables in the model (Hsieh and Larsen 2003). VIF will be calculated using the following equation:

$$VIF = \frac{1}{1-R_i^2} \text{ Eq. (6)}$$

Moreover, the VIF value provide valuable indications of multicollinearity levels in regression models: (i) a VIF of 1 indicates no multicollinearity, (ii) a VIF ranging from 1 to 5 pints to moderate multicollinearity, and (iii) a VIF greater than 5 signifies high multicollinearity

(James et al. 2013). According to O'Brien (2007), a widely accepted threshold for evaluating VIF values is typically set at ten.

The findings presented in Appendix 8 demonstrate the absence of multicollinearity across all models, as evidenced by VIF consistently below 5, suggesting that the independent variables do not exhibit high degrees of correlation.

## 4. Data

This chapter provides a description of the utilized sample and an overview of the process of data collection. Furthermore, the section provides summary statistics of the variables included in the econometric model.

### 4.1 M&A transactions

To assess the research questions presented, a data sample is assembled primarily utilizing the databases available via Refinitiv Eikon, recognized as one of the most extensive databases concerning global transactional engagements and contains over 1.45 million M&A transactions since the 1970s (LSEG 2024). The primary dataset includes completed M&A transactions within the time frame of 2002-2023, featuring targets in emerging market countries and acquirer's from developed nations. Moreover, the database allows users to screen and analyze deals based on various criteria such as countries involved, time of deal, deal type, industry, among others.

### 4.2 ESG scores

ESG data for the firms involved in the M&A transactions examined is retrieved from ASSET4, a database provided by Refinitiv Eikon. Refinitiv's ESG database is among the industry's most extensive, covering over 90 percent of the global market capitalization with historical data going back to 2002 (LSEG 2023). Refinitiv's score aims to provide a transparent and data-driven assessment of a company's relative ESG performance, and gathers its data from various sources, including annual reports, company websites, NGO websites, stock exchange filings, CRS reports and other news sources. Furthermore, the ESG score are

derived from over 630 company-level ESG measures, grouped into 10 categories, which are then aggregated into three the pillars. Hence, the overall ESG score is a sum of the category weights normalized to percentages between 0 and 100 according to table 1 (ibid.).

Table 1: Refinitiv Eikon ESG Score

Pillar	Category	Indicators in Scoring	Weights (%)
Environmental	Resource Use	20	15
	Emissions	28	15
	Innovation	20	13
Social	Workforce	30	13
	Human Rights	8	5
	Community	14	9
	Product Responsibility	10	4
Governance	Management	35	17
	Shareholders	12	5
	CRS Strategy	9	3

Source: LSEG 2023

The table provides a brief description of the methodology and categories used in the Refinitiv Eikon ESG score, indicating the number of metrics considered and the respective weights assigned to each pillar and the overall ESG score.

The lack of convergence in ESG scores is a notable issue highlighted by various studies. Chatterji et al. (2015) underscores the need for more uniform assessment frameworks to achieve greater consistency in ESG evaluations. On the other hand, Refinitiv Eikon’s ESG score are considered appropriate for this study due to their quantitative approach, which enhances their objectivity and reduces bias.

### 4.3 Sample selection

The primary dataset aims to analyse the relationship between the target's ESG score and the acquisition premium, as outlined in *Hypotheses 1*. The sample includes deals with a rank value (inclusive of the target's net debt) greater than 0, focusing solely on completed M&A transactions involving public targets. To expand the analysis scope and maximize sample size, transactions involving private acquirers are also considered. This study specifically targets deals where the target company is located in emerging market countries, and the acquirer is originated from developed countries, shedding light on cross-border M&A dynamics (shown in Appendix 1). The timeframe for this analysis is set from January 1<sup>st</sup> 2002, to December 31<sup>st</sup> 2023, providing a broad perspective on trends across two decades. These inclusion criteria produced a total of 2631 transactions.

Certain exclusions are made to further refine the sample. Transactions are removed from the dataset if the acquisition premium is missing or cannot be calculated based on data leading up to the announcement. Likewise, deals are excluded if the target company does not have an ESG score on the announcement date and if the target's identification code is missing (which complicates the addition of financial variables for analysis). As a result, the final sample comprises 206 transactions. To complement the dataset, transaction-related data such as acquisition premiums and deal sizes, along with firm-specific financial data for the target, are sourced from Refinitiv Eikon.

The secondary dataset, extracted from the primary data sample of 206 transactions, is specifically designed to test *Hypotheses 2* and *3*. Therefore, this dataset includes only those transactions where ESG scores are available for both the target and the acquirer, resulting in a final sample of 63 deals. The dataset is complemented with financial data for the acquirer, obtained from Refinitiv Eikon. The screening process and criteria for sample selection are summarized in table 2 below, which also highlights the reduction in sample size at each criterion.

*Table 2: Sample selection*

<b>Filter</b>	<b>No. of Deals</b>
Completed M&A deals with announcement date from 01.01.2002	846 299
Geographical limitation: Target (emerging) and Acquirer (developed)	36 991
Public Target	3 660
Target identifier	3 660
Deal Premium (including the net debt of target) >0	2 631
<b>Number of deals before adding ESG data</b>	<b>2 631</b>
ESG score in the announcement year	212
Remove deals without financial data on premium/outliers	206
<b>Sample size when target has ESG score</b>	<b>206</b>
<b>Sample size when acquirer has ESG score</b>	<b>63</b>

The table provides a description of the screening criteria applied for both the primary and the secondary dataset.

#### 4.4 Sample overview

Table 3 presents the summary statistics for both the primary and secondary datasets, capturing the range of variables included in this empirical study. Regarding the dependent variables, the acquisition premium is represented by a mean of 18.2 percent and ranges from the lowest discount of 48.4 percent to the highest premium of 105.9 percent. The changes in the acquirer's ESG score average 3.9 percent, while the mean change in stock price is negative by

6 percent, both reflecting the significant complexity and diversity of the deals. The average ESG score of the target firms is represented by 44.1, with detailed assessments across environmental, social, and governance pillars, highlighting the diverse sustainability practices prevalent among the sampled target companies.

*Table 3: Summary statistics*

<b>Variable</b>	<b>Unit</b>	<b>N</b>	<b>Mean</b>	<b>S,D,</b>	<b>Min</b>	<b>Max</b>
<b>Dependent Variables</b>						
Premium	Percentage	206	18.2	32.3	-48.4	105.9
Δ Acquirer ESG	Percentage	63	3.9	20.2	-40.3	130.4
Δ Acquirer Stock Price	Percentage	63	-6.0	24.0	-51.0	53.0
<b>ESG Score</b>						
Target ESG Score	Number	206	44.1	20.6	3.1	88.7
Target E Pillar Score	Number	206	39.1	25.0	0.7	97.9
Target S Pillar Score	Number	206	44.5	24.1	1.0	93.8
Target G Pillar Score	Number	206	48.7	22.8	3.5	95.3
Target ESG/Acquirer ESG	Percentage	63	1.0	1.3	0.2	8.3
<b>Financial Variables Target</b>						
Size	LN(Assets USD m)	206	8.4	1.5	3.6	12.2
Leverage	Debt/Assets	206	0.5	3.4	0.0	48.4
ROA	Net Income/Assets	206	0.0	0.1	-0.3	0.3
Investment Rate	CapEx/Assets	206	0.1	0.1	0.0	0.3
P/B	Price/Equity	206	0.0	0.1	-0.1	1.0
<b>Deal Specific Variables</b>						
Deal Value	LN(USD m)	206	867.5	1,234.8	0.2	10,776.5
Multiple Bidders	Dummy	206	0	0.1	0	1
Deal Advisors Target	Dummy	206	0.5	0.5	0	1
Hostile	Dummy	206	0	0.2	0	1
Toehold	Dummy	206	0.4	0.5	0	1
<b>Financial Variables Acquirer</b>						
Δ Size	Percentage	63	0.4	1	-2.0	4.7
Δ Leverage	Percentage	63	570.4	2,629.7	-100.0	15,940.6
Δ Revenue	Percentage	63	9.7	43.0	-74.3	240.6
Δ P/E	Percentage	63	-3.7	93.5	-263.2	373.5
Δ ROA	Percentage	63	-4.0	92.1	-447.3	154.5
Δ Investment Rate	Percentage	63	0	31.1	-92.2	122.0

The table displays summary statistics for the primary and secondary datasets

Table 4 presents the distribution of transactions by announcement year. The frequency distribution shows that 80 percent of the transactions in the primary dataset, including 206 transactions, occurred in the previous decade spanning from 2013-2023. Additionally, the

average ESG score for acquirer's from developed markets is 23.2 units higher than that of targets originating from emerging market countries.

*Table 4: Frequency distribution of transactions based on announcement year*

Year	No.	Proportion (%)	Target						Acquirer		
			Mean Premium (%)	Median Premium (%)	Mean ESG Score	Mean E Score	Mean S Score	Mean G Score	No.	Proportion (%)	Mean ESG Score
2003	(1)	0.5	46.4	46.4	10.2	2.4	17.2	9.0	(0)	0	n.a.
2004	(1)	0.5	11.3	11.3	14.3	0.7	27.7	10.2	(0)	0	n.a.
2005	(0)	0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	(0)	0	n.a.
2006	(3)	1.5	6.1	6.6	24.9	30.4	24.4	34.6	(1)	1.6	24.8
2007	(1)	0.5	45.1	45.1	24.9	9.1	44.3	27.8	(0)	0	n.a.
2008	(4)	1.9	31.3	37.4	59.1	36.3	58.9	77.5	(3)	4.8	72.8
2009	(1)	0.5	-38.4	-38.4	18.7	9.1	18.1	33.2	(0)	0	0
2010	(8)	3.9	23.5	18.6	41.1	42.5	44.6	38.6	(7)	11.1	75.2
2011	(7)	3.4	16.1	12.4	49.5	40.4	49.0	59.8	(5)	7.9	65.1
2012	(15)	7.3	11.6	1.9	30.4	22.6	22.5	49.8	(3)	4.8	51.5
2013	(17)	8.3	11.2	3.9	43.2	37.8	42.7	51.1	(5)	7.9	46.6
2014	(10)	4.9	14.7	7.3	39.0	30.8	33.8	56.9	(3)	4.8	57.0
2015	(16)	7.8	28.1	24.3	26.1	18.9	22.9	39.7	(2)	3.2	81.0
2016	(10)	4.9	23.5	15.5	45.6	43.2	47.1	41.7	(1)	1.6	65.4
2017	(13)	6.3	31.6	26.3	35.4	30.3	34.0	48.5	(4)	6.4	79.5
2018	(8)	3.9	4.1	-3.0	44.4	46.7	45.1	39.6	(4)	6.4	77.4
2019	(10)	4.9	26.8	25.8	59.9	52.0	58.0	67.9	(4)	6.4	81.1
2020	(9)	4.3	23.8	24.8	60.5	51.1	62.2	64.5	(3)	4.8	82.4
2021	(25)	12.1	16.6	10.5	48.4	42.5	53.5	46.7	(9)	14.3	70.4
2022	(25)	12.1	13.6	8.9	46.3	42.1	47.3	46.7	(2)	3.2	50.2
2023	(22)	10.7	14.5	10.9	56.9	58.5	61.8	47.3	(7)	11.1	75.3
<b>Total</b>	<b>206</b>	<b>100</b>	<b>18.1</b>	<b>14.8</b>	<b>38.9</b>	<b>32.4</b>	<b>40.8</b>	<b>44.6</b>	<b>63</b>	<b>100</b>	<b>62.1</b>

The table describe the frequency distribution of transactions by announcement year

Table 5 illustrates the frequency distribution of transactions based on macro industry. The financial sector emerges as the predominant sector, representing the largest proportion of both acquirer's and targets. While the distribution of target industries is relatively even, the financial sector is significantly overrepresented among acquirer's, accounting for 63.6 percent of all acquirer transactions compared to 17.5 percent for targets.

*Table 5: Frequency distribution of transactions based on macro industry*

<b>Macro Industry</b>	<b>No. Targets</b>	<b>Proportion (%)</b>	<b>No. Acquirer's</b>	<b>Proportion (%)</b>
Energy and Power	(32)	15.5	(12)	5.8
Financials	(36)	17.5	(131)	63.6
Media and Entertainment	(10)	4.9	(6)	2.9
Telecommunications	(18)	8.7	(12)	5.8
Real Estate	(13)	6.3	(0)	0
Consumer Staples	(13)	6.3	(11)	5.3
Healthcare	(16)	7.8	(3)	1.5
Materials	(20)	9.7	(9)	4.4
Retail	(9)	4.4	(4)	1.9
High Technology	(12)	5.8	(4)	1.9
Industrials	(20)	9.7	(7)	3.4
Consumer Products and Services	(7)	3.4	(4)	1.9
Government and Agencies	(0)	0	(3)	1.5
<b>Total</b>	<b>206</b>	<b>100</b>	<b>206</b>	<b>100</b>

The table describe the frequency distribution of transactions by macro sector

## 5. Empirical result and analysis

This chapter presents the empirical results from the regressions conducted to test the stated hypotheses. It also includes the outcomes of the performed robustness tests. The results are detailed in accompanying tables that summarize the regression outcomes and robustness checks.

### 5.1 Impact of target ESG scores on control premium

*Hypothesis 1* focuses on exploring the impact of the emerging market target firm's ESG score on the premium paid by a developed market acquirer, during acquisitions. Specifically, model 1 assesses the impact of the overall ESG score, while models 2a, 2b, and 2c each focus on the individual contributions of the environmental, social, and governance pillars to the premium.

Table 6 presents the regression output from model 1, which examines the impact of the overall ESG score on the premium paid during acquisitions. The results indicate a significant small positive relationship between the target's ESG score and the acquisition premium, significant at the 10 percent level. Specifically, a one-unit increase in the ESG score is associated with a 0.002 percentage point increase in the acquisition premium. The positive correlation identified between the ESG scores of target companies and their acquisition premiums corroborates insights posited by Binesh et al. (2021) and Gomes and Marsat (2018), which suggest that robust ESG practices can enhance a firm's perceived value by lowering investment risks and decreasing information asymmetry. This aligns with stakeholder theory, which advocates that sustainable practices contribute to firm value by improving reputation and reducing operational risks, thereby attracting higher premiums. Hence, the findings, even though small effect, highlights the relevance of ESG scores in influencing acquisition premiums, a result that supports the argument that higher ESG standards are typically rewarded in the marketplace. This can be argued to be particularly relevant within emerging markets where the effects of improved transparency and reduced risk are perhaps more pronounced due to generally higher levels of operational and regulatory uncertainty.

Furthermore, the control variables leverage, toehold presence, and the hostile nature of an acquisition were significant at the 10 percent level, positively influencing the acquisition

premium. Conversely, control variables such as ROA (significant at the 10 percent level) and investment rate (significant at the 1 percent level) demonstrated a negative impact on the premium. The adjusted  $R^2$  value indicates that approximately 7.4 percent of the variability in the data is accounted for by the model's predictive capability. Additionally, the model demonstrates statistical significance, as indicated by a p-value of 0.00.

Model 2a, which focuses on the environmental aspect of ESG, does not show a significant relationship with acquisition premiums. This could indicate that environmental factors might not be as critical in influencing premiums as other aspects, which is somewhat contrary to previous expectations set by general CSR discussions in the literature (Gomes and Marsat 2018). However, the findings from model 2b suggest a significant positive effect of the social pillar score on premiums, confirmed at the 5 percent level. For each unit increase in the social score, there is a 0.002 percentage point rise in the acquisition premium. This particular aspect underscores the cultural and regulatory differences highlighted in cross-border transactions and reflects the importance of social performance in such settings (Qiao and Wu 2019). Both model 2a and 2b is statistically significant and demonstrate an adjusted  $R^2$  value of 6.6- and 8.0 percent, respectively.

Conversely, model 2c indicates no significant relationship between governance scores and acquisition premiums. This result challenges some of the traditional views that stronger governance might be valued in financial transactions, suggesting a possible divergence in how governance factors are perceived in different markets or scenarios (André and Yen 2019). This observation is reflective of the insights by Erben et al. (2022), indicating that not all components of ESG may be equally valued by the market or may interact with other factors that dilute or enhance their perceived value. It underscores the need for a more granular analysis to understand how different aspects of ESG performance influence M&A transactions, especially in cross-border settings where regulatory and cultural contexts vary significantly. The model's adjusted  $R^2$  value is 6.3 percent, with a p-value of 0.00.

Table 6: Regression results of models 1, 2a, 2b and 2c

Dependent Variable	Premium							
	1		2a		2b		2c	
Model	Coef,	P>t	Coef,	P>t	Coef,	P>t	Coef,	P>t
Target ESG Score	0.002*	(0.088)						
Target E Pillar Score			0.001	0.298				
Target S Pillar Score					0.002**	(0.043)		
Target G Pillar Score							0.001	(0.491)
Size	-0.002	(0.906)	0.002	0.917	-0.002	(0.916)	0.006	(0.743)
Leverage	0.003*	(0.060)	0.003*	0.057	0.003*	(0.067)	0.003*	(0.065)
ROA	-0.602*	(0.060)	-0.587*	0.064	-0.621*	(0.050)	-0.565*	(0.073)
Investment Rate	-1.004***	(0.007)	-0.963**	0.010	-1.021***	(0.006)	-0.976***	(0.009)
P/B	0.109	(0.202)	0.105	0.224	0.082	(0.330)	0.112	(0.207)
Deal Value	0.000	(0.459)	0.000	0.422	0.000	(0.457)	0.000	(0.444)
Cash Financing	-0.017	(0.725)	-0.017	0.731	-0.015	(0.755)	-0.020	(0.685)
Multiple Bidders	0.033	(0.910)	0.016	0.959	0.017	(0.950)	0.039	(0.892)
Deal Advisors Target	-0.003	(0.952)	0.001	0.983	-0.007	(0.890)	0.002	(0.965)
Hostile	0.194*	(0.057)	0.208*	0.054	0.195*	(0.053)	0.192*	(0.076)
Toehold	0.077*	(0.090)	0.079*	0.081	0.069	(0.123)	0.084*	(0.063)
Intercept	0.000	(0.999)	0.021	0.895	-0.002	(0.991)	0.007	(0.966)
Year Fixed Effect	Yes		Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Observations	206		206		206		206	
R <sup>2</sup>	0.137		0.130		0.143		0.127	
Adjusted R <sup>2</sup>	0.074		0.066		0.080		0.063	
F-Statistic	3.71		3.56		3.79		3.50	
Prob>F	0.000		0.000		0.000		0.000	

p-values specified in parentheses. \* p<0.1, \*\*p<0.05, \*\*\*p<0.01

In conclusion, the significant positive impact of the overall ESG score and the social pillar score on acquisition premiums supports the notion that these elements might serve as important signals to reduce information asymmetry and perceived risks in acquisitions, especially in emerging markets (Binesh et al. 2021). However, the lack of significant findings for environmental and governance scores may point to a more nuanced interpretation required in these areas, possibly influenced by the specific context of the deal or the characteristics of the target market.

## 5.2 Analysis of pre-merger sustainable performance and post-merger sustainable performance

*Hypothesis 2* explores the impact of pre-merger ESG scores on the long-term sustainability performance of merged firms, positing that superior ESG performance of the target company relative to the acquirer's performance before the merger leads to enhanced post-merger sustainability performance for the combined entity. Table 7 presents the regression results, highlighting the coefficients and their p-values.

Table 7: Regression results of model 3

Dependent Variable	$\Delta$ Acquirer ESG	
Model	3	
	Coef.	P>t
Target ESG/Acquirer ESG	0.009	(0.575)
$\Delta$ Size	3.710	(0.544)
$\Delta$ Leverage	0.000	(0.886)
$\Delta$ Revenue	0.014	(0.919)
$\Delta$ P/E	0.023	(0.269)
$\Delta$ ROA	0.060*	(0.055)
$\Delta$ IR	0.113	(0.327)
Intercept	-0.178*	(0.055)
Year Fixed Effect	Yes	
Industry Fixed Effect	Yes	
Observations	63	
R <sup>2</sup>	0.213	
Adjusted R <sup>2</sup>	0.080	
F-Statistic	1.25	
Prob>F	0.288	

p-values specified in parentheses. \* p<0.1, \*\*p<0.05, \*\*\*p<0.01

The regression results from model 3, which aimed to measure the impact of the relative pre-merger ESG performance on the acquirer's post-merger ESG scores, did not yield statistically significant findings for the influence of target ESG scores relative to the acquirer's scores. Although the academic framework posited by Aktas et al. (2011) and Nguyen et al. (2024) supports a positive impact of pre-merger ESG performance on post-merger sustainability outcomes, the empirical data from this thesis does not conclusively support this relationship. However, changes in ROA show a significant positive impact on the acquirer's post-merger ESG performance. This might indicate that while the ESG alignment between the companies at the merger announcement does not directly predict post-merger ESG outcomes, financial performance improvements post-merger could be associated with superior ESG outcomes.

The findings suggest that while the integration of target firms with strong sustainable practices can have tendency to enhance post-merger ESG performance, the empirical evidence from this study indicates that the effect is not strong enough to be statistically validated within the sample and methodology used. This discrepancy may be influenced by several factors that resonate with the broader literature. The literature acknowledges that while acquiring firms with higher ESG scores might theoretically lead to enhanced sustainability practices, the practical integration and realization of these benefits can be complex and influenced by numerous external and internal factors. For instance, the influence of cross-border dynamics, industry-specific contexts, and cultural differences, as highlighted by Nguyen et al. (2024), can moderate the strength and direction of this relationship. These factors could contribute to the variability and lack of significant findings in the study.

Moreover, the results underscore the challenges associated with applying theoretical frameworks to practical scenarios. The substantial relevance of the findings from Anagnostopoulou and Tampakoudis (2020) and Rahman and Wu (2023) in European and Chinese contexts suggested that geographical and cultural factors might significantly influence the outcomes of ESG integration post-M&A, a dynamic that might also be present in this study's context involving emerging markets.

Therefore, while the hypothesis anticipated a positive impact of pre-merger ESG performance on post-merger sustainability, the actual results suggest a more complex and perhaps limited effect within the specific context of this study. This underscores the necessity for more nuanced and context-specific research that considers the multifaceted nature of ESG integration in M&As, particularly in cross-border settings involving diverse regulatory environments and cultural practices.

### 5.3 Impact of ESG performance on post-merger value

The regression results for model 4a and 4b are summarized in table 8. These findings suggest that there is no significant relationship between improvements in the acquirer's ESG score and changes in its stock price post-merger (model 4a). This finding is in alignment with the

insights of proposed by Feng (2021), who also did not observe a direct correlation between ESG scores and stock price performance following M&As. This suggests that while ESG improvements are generally viewed favourably, they may not immediately translate into financial gains in the stock market, potentially due to the time it takes for these sustainable investments to materialize into tangible financial outcomes. This aligns with the notion proposed by Deng et al. (2013), where the value of sustainable practices often manifests in the long term rather than immediately at stock price levels. However, changes in company size were found to positively influence stock price, highlighting the importance of growth factors in value creation.

In contrast, model 4b reveals a significant positive correlation between the ratio of the target's ESG score to the acquirer's and subsequent increases in stock price. This result supports the stakeholder theory advocated by Aktas et al. (2011), suggesting that acquisitions aimed at enhancing sustainability standards can indeed lead to enhanced market valuations, particularly when there is a noticeable disparity in ESG performance favouring the target. This could be attributed to the market's perception of reduced risk and enhanced reputation, which are critical in long-term value creation. The findings further emphasize the importance of strategic alignment in ESG practices during M&As. As suggested by studies such as those by Anagnostopoulou and Tampakoudis (2020), aligning and integrating robust ESG practices can yield positive returns, especially in environments where sustainability is increasingly valued by stakeholders. However, the variable outcomes across different models and studies highlight the intricate dynamics at play, including the influence of agency costs and governance mechanisms noted by André and Yen (2019), which can moderate the benefits derived from ESG-focused strategies.

However, while the empirical evidence underscores the potential of ESG to enhance post-M&A financial performance, it also points to the nuanced and sometimes contradictory nature of these effects, suggesting that ESG integration should be approached with a strategic and contextual awareness of its potential impacts on financial outcomes. Therefore, it is crucial to recognize that stock price reactions can be influenced by multiple factors and thus, while the results are significant, they should not be viewed as the sole justification for targeting firms

with superior ESG performance but rather as one of several effects associated with such strategic decisions.

*Table 8: Regression results of model 4a and 4b*

Dependent Variable Model	Δ Acquirer Stock Price			
	4a		4b	
	Coef.	P>t	Coef.	P>t
Target ESG/Acquirer ESG			0.022***	(0.006)
Δ Acquirer ESG	0.176	(0.408)		
Δ Size	4.882*	(0.064)	5.771**	(0.041)
Δ Leverage	0.001	(0.582)	0.001	(0.509)
Δ Revenue	-0.106	(0.199)	-0.111	(0.161)
Δ P/E	0.038	(0.265)	0.041	(0.215)
Δ ROA	-0.010	(0.697)	0.000	(0.995)
Δ IR	0.067	(0.526)	0.089	(0.377)
Intercept	0.043	(0.639)	-0.004	(0.970)
Year Fixed Effect	Yes		Yes	
Industry Fixed Effect	Yes		Yes	
Observations	63		63	
R <sup>2</sup>	0.199		0.196	
Adjusted R <sup>2</sup>	0.063		0.059	
F-Statistic	2.08		2.62	
Prob>F	0.048		0.014	

p-values specified in parentheses. \* p<0.1, \*\*p<0.05, \*\*\*p<0.01

The empirical findings from model 4a and 4b are reflective of a broader discussion in the literature about the role of sustainable performance in post-M&A financial outcomes. Studies such as those by Deng et al. (2013) and Aktas et al. (2011) support the idea that high CSR standards in acquiring firms can lead to superior long-term returns. These outcomes align with stakeholder theory, which posits that sustainable investments improve firm assets and market value over time. However, as noted by researchers like Feng (2021) and André and Yen (2019), the relationship between ESG performance and financial outcomes can be complex and influenced by various factors, including agency costs and investor perceptions of CSR as either a potential cost or benefit.

## 5.4 Sensitivity tests

### 5.4.1 Efron's Bootstrap

To ensure the robustness of our empirical results and mitigate potential biases due to small sample sizes, we employed Efron's Bootstrap method. The bootstrap results, presented in Appendix 6, confirm the reliability of the findings related to model 1, 2a, 2b and 2c as the bootstrap regressions remain consistent with those from the original OLS models.

Specifically, the positive relationship between the target's ESG score and the acquisition premium persists across bootstrap samples, reinforcing the conclusion that higher ESG scores are associated with higher acquisition premiums. Similarly, the positive impact of the social pillar score on acquisition premiums observed in Model 2b is also confirmed by the bootstrap analysis.

The bootstrap analysis for Model 3 shows that the coefficient for the ratio of the target's ESG score to the acquirer's ESG score is not statistically significant. This result suggests that the relative pre-merger ESG performance of the target firm does not have a significant impact on the acquirer's post-merger ESG performance.

The bootstrap results for model 4a indicate that the change in the acquirer's ESG score does not significantly influence the change in its stock price post-merger. This lack of significance suggests that immediate improvements in the acquirer's ESG performance are not directly reflected in the stock price in the short term. Similarly, the result for model 4b shows an insignificant relationship between the ratio of the target's ESG score to the acquirer's and the change in the acquirer's stock price post-merger. The bootstrap results for Model 4b reveal an insignificant relationship between the ratio of the target's ESG score to the acquirer's ESG score and the change in the acquirer's stock price post-merger. This finding contrasts with the original OLS regression result, which indicated a significant positive relationship. The discrepancy suggests potential selection and sample biases, likely due to the limitation in the availability of ESG scores for all entities involved in the M&A transactions under study. Consequently, the dataset used may be more selective and potentially less representative.

By applying Efron's Bootstrap method, we enhance the reliability and generalizability of our empirical results, ensuring that the conclusions drawn about the impact of ESG performance on acquisition premiums and post-merger outcomes are robust to potential selection bias and sample variability. This approach validates the robustness of our primary findings while also highlighting areas where sample limitations may influence the results.

## 5.5 Limitations

This section aims to discuss limitations that the report is exposed to and affected by. Firstly, the study is subject to sample selection bias as it relies heavily on transactions where both the target and the acquirer are required to have available ESG scores. This criterion excludes a significant number of M&A transactions that might offer valuable insights but do not meet the specified criteria. Moreover, the dataset predominantly includes public targets from emerging markets and acquirer's from developed countries, which may not fully represent the dynamics present in transactions involving private companies or where both entities are originated from the same type of market.

Another limitation arises from the dependence on a single data provider, Refinitiv Eikon and ASSET4, for transaction data and ESG scores. Additionally, the consistency and reliability of the ESG scores could be affected by the fact that Refinitiv Eikon's ESG scoring system aggregates data from various sources that might have differing standards and accuracy levels. The changes in methodology over time or across regions could influence the consistency of the ESG scores used. The analysis is also constrained within the timeframe of 2002 to 2023 and changes in global economic conditions, regulatory environments, and market behaviors over these years are challenging to control for and might influence the results. The focus solely on targets from emerging markets and acquirer's from developed nations might limit the generalizability of the findings to other M&A scenarios where both parties are from the same economic classification or from geographic settings not covered in the investigation.

Finally, the specific context of cross-border transactions between developed and emerging markets may exhibit unique characteristics that do not hold in other types M&A's, limiting the external validity of the study's findings. These limitations underscore the need for cautious

interpretation and the results should be seen as associated effects rather than base arguments for acquirer's to target ESG compliant targets.

## 6. Conclusion and future research

This thesis is aiming to explore the intricate dynamics of ESG factors in cross-border M&As where developed market acquirers are purchasing emerging market targets, drawing upon a robust dataset covering 206 transactions from 2002 to 2023. This study not only sheds light on the impact of ESG performance on acquisition premiums but also examines its influence on the long-term sustainable practises and stock price performance of the acquiring firms.

The research indicates that emerging market firms with higher ESG scores tend to attract higher acquisition premiums, suggesting that such firms are perceived as lower-risk investments, thereby increasing their appeal to acquirer's from developed markets. This finding aligns with the increasing global emphasis on ESG factors as essential elements in investment decisions, marking a shift towards sustainability-focused and stakeholder-aligned corporate strategies. However, the results also present a nuanced picture of the post-merger implications of ESG and the post-merger landscape is complex. While acquiring a target with relatively higher ESG score is positively correlated with an increase in the acquirer's stock price, the study reveals no definitive association between the targets pre-merger ESG performance and the long-term sustainable performance of the merged entity. This underscores the complexity of ESG factors and their varied influence on post-merger outcomes, suggesting that ESG metrics alone may not predict long-term performance enhancements.

The robustness tests performed suggests that the output from the majority of models are persistent with our primary findings. However, the bootstrap results for the examination between the ratio of the target's ESG score to the acquirer's and the change in the acquirer's stock price post-merger reveal an insignificant result, which is contradicting to our main findings. Moreover, the analysis of stock price reactions post-merger reveals that while the market values the acquisition of companies with strong ESG standards, such gains are not solely attributable to ESG factors but also to broader economic and strategic considerations. This is a crucial insight for investors and corporate managers, indicating that while ESG

integration is beneficial, it should be part of a broader strategic framework that considers various performance metrics rather than a stand-alone rationale.

The strategic integration of ESG considerations into M&A activities, especially in the volatile and diverse markets of emerging economies, presents both challenges and opportunities. For policymakers and corporate leaders, the findings emphasize the importance of developing more refined ESG evaluation tools that can better capture the long-term benefits of sustainable practices. For academia, this research opens up new avenues for exploring the causal relationships between ESG performance and financial outcomes in the context M&As. Several pathways can be pursued to deepen the understanding of ESG factors in cross-border M&As, particularly within the context of emerging markets. Firstly, sector-specific impacts could be a focus. Investigating how ESG factors influence M&A outcomes across different industries might reveal sector-specific dynamics and resilience to ESG-related challenges, providing targeted insights for investors and policymakers. Secondly, comparative studies between emerging and developed markets would offer a broader perspective, highlighting differing dynamics in ESG integration and performance outcomes, thus enhancing the global understanding of ESG impacts. Lastly, examining the integration challenges and successes of ESG practices post-M&A could provide deeper practical insights, helping companies better navigate the complexities of ESG implementation and integration. These areas of research aiming to enrich the current understanding and offer practical frameworks for leveraging ESG factors in enhancing M&A success globally.

In conclusion, this thesis contributes to the existing body of knowledge by providing empirical evidence from emerging markets and highlighting the complex role of ESG factors in shaping M&A dynamics. It also lays the groundwork for future research to further dissect the conditions under which ESG factors influence M&A outcomes, thereby enhancing our understanding of the strategic value of sustainability in global business practices.

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# Appendix

## Appendix 1

Countries included in sample

<b>Target Country (Emerging Markets)</b>	<b>Acquiring Country (Developed Markets)</b>
Argentina	Australia
Bangladesh	Austria
Brazil	Belgium
Bulgaria	Canada
Chile	Denmark
China	Finland
Colombia	France
Czech Republic	Germany
Egypt	Hong Kong
Greece	Ireland
Hungary	Israel
India	Italy
Indonesia	Japan
Iran	Luxembourg
Kuwait	Netherlands
Malaysia	New Zealand
Mexico	Norway
Morocco	Portugal
Nigeria	Singapore
Pakistan	Spain
Peru	Sweden
Philippines	Switzerland
Poland	United Kingdom
Qatar	United States
Romania	Malta
Russia	Croatia
Saudi Arabia	Iceland
South Africa	Monaco
South Korea	
Taiwan	
Thailand	
Turkey	
United Arab Emirates	
Vietnam	

Source: Dow Jones (2024), FTSE Russell (2023), International Monetary Fund (2021), MSCI (2024), Reuters (2021)

Note: The table includes all geographic regions represented in the sample, covering both acquirer's and targets

## Appendix 2

### Control Variable Definitions – *Hypothesis 1*

Variable	Abbreviation	Definition
<b>Financial Variables Target</b>		
Size	Size	Natural logarithm of total assets
Leverage	Leverage	Ratio between total debt and total assets
Return on Assets	ROA	Ratio between net income pre-extraordinary items and total assets
Investment Rate	Investment Rate	Ratio between CapEx and total assets
Price-to-Book Ratio	P/B	Ratio between price and book value of equity
<b>Deal Specific Variables</b>		
Deal Value	DV	Natural logarithm of the total transaction value paid by the acquirer
Cash Financing	Cash Financing	Whether the transaction is paid in cash. Measured as a binary variable with 1 representing cash financed.
Multiple Bidders	Multiple Bidders	Whether the deal had multiple bidders involved in the bidding process. Measured as a binary variable with 1 representing multiple bidders.
Deal Advisors Target	Deal Advisors Target	Whether the deal has involvement of financial or legal advisors. Measured as a binary variable with 1 representing involvement of advisors.
Hostile	Hostile	Whether the deal has involvement of financial or legal advisors by acquiring company. Measured as a binary variable with 1 representing involvement of advisors by acquirer.
Toehold	Toehold	Whether the acquirer has a stake of 5 percent or more in the target, prior to announcement. Measured as a binary variable with 1 representing toehold.
<b>Fixed Effects</b>		
Year		Dummy indicating the year of observation
Industry		Dummy indicating the macro industry which the firm operates in

Source: Refinitiv Eikon

Note: The table provides definitions and descriptions of each control variable incorporated when investigating *Hypothesis 1*

## Appendix 3

### Control Variable Rationale – Hypothesis 1

Variable	Rationale	Expected Sign
<b>Financial Variables</b>		
Size	Larger target sizes may reduce acquisition premiums due to diminishing asset benefits and higher integration costs, leading to smaller premiums for bigger companies (Beckman and Haunschild 2002; Comment and Schwert 1995; Alexandridis et al. 2011).	-
Leverage	High target leverage may lower the premium due to debt aversion (Harford, et al. 2009; Dionne et al. 2015), while Covrig, McConaughy, and Travers (2017) argue it can increase the premium by lowering the purchase price, thus reducing the acquirer's payment in cash or shares.	+/-
Return on Assets	A higher ROA may indicate a more profitable and efficiently managed company, potentially leading to a higher acquisition premium (DePamphilis 2019).	+
Investment Rate	Gomes and Marsat (2018) discovered that capital expenditures can influence deal premiums because a high CapEx by the target firm suggests a greater potential for realizing synergies.	+
Price-to-Book Ratio	A lower P/B ratio suggests the target may be undervalued, potentially leading to a higher premium as acquirer's aim to capitalize on the value discrepancy. Conversely, a high P/B ratio might signal an overvalued company, possibly resulting in a cautious premium offer.	+/-
<b>Deal Specific Variables</b>		
Deal Value	Larger deals tend to attract greater public scrutiny, leading to heightened competition and elevated prices (Madura et al. 2012).	+
Cash Financing	Cash deals lead to higher acquisition premiums due to tax impacts on the target and convey the acquirer's confidence by assuming full risk, requiring a premium to compensate for immediate tax liabilities (Comment and Schwert 1995).	+
Multiple Bidders	When multiple bidders are involved, a target's bargaining power tends to increase (Bradley et al. 1988; Giliberto and Varaiya 1989; Dionne et al. 2015), hence affecting the transaction premium positively.	+
Deal Advisors Target	Reuer et al. (2012) and Bonini et al. (2017) find that investment bankers' involvement in the target company results in higher acquisition premiums and contributes significantly to M&A success and value creation.	+
Hostile	Prior research suggest that hostile takeovers often result to the initiation of anti-takeover defences within the target company, thus leading the acquirer to offer a higher premium as an action to motivate the target to accept the bid (Ayers et al. 2003; Cain et al. 2017).	+

Toehold	Toeholds help reduce information asymmetries by allowing acquirer's to closely observe and monitor the target, thereby decreasing the premiums paid (Dionne et al. 2015; Walkling and Edmister 1985; Mantecon 2009; Grossman and Hart 1980). Betton and Eckbo (2000) also note that US target shareholders receive lower premiums when bidders have significant toeholds, yet few bidders acquire toeholds before takeovers. Ayers et al. (2003) mention that reduced information asymmetry can impact the target's bargaining power, with varied outcomes.	+/-
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Note: The table outlines the expected signs and rationales for each control variable relevant to *Hypothesis 1*, supported by literature that details the associations

## Appendix 4

### Control Variable Definitions – *Hypothesis 2* and *3*

Variable	Abbreviation	Definition	Formula
<b>Financial Variables Acquirer</b>			
Δ Size	ΔSize	Change in the acquirer's natural logarithm of total assets	$\Delta Size_i = \frac{Size_{i, 1 \text{ year after deal}} - Size_{i, \text{at announcement}}}{Size_{i, \text{at announcement}}}$
Δ Leverage	ΔLev	Change in the acquirer's ratio between total debt and total assets	$\Delta Leverage_i = \frac{Leverage_{i, 1 \text{ year after deal}} - Leverage_{i, \text{at announcement}}}{Leverage_{i, \text{at announcement}}}$
Δ Revenue	ΔRev	Change in total revenue of the acquirer	$\Delta Revenue_i = \frac{Revenue_{i, 1 \text{ year after deal}} - Revenue_{i, \text{at announcement}}}{Revenue_{i, \text{at announcement}}}$
Δ P/E	ΔPE	Change in the acquirer's price-to earnings ratio	$\Delta P/E_i = \frac{P/E_{i, 1 \text{ year after deal}} - P/E_{i, \text{at announcement}}}{P/E_{i, \text{at announcement}}}$
Δ Return on Assets	ΔROA	Change in the acquirer's ratio between net income pre-extraordinary items and total assets	$\Delta ROA_i = \frac{ROA_{i, 1 \text{ year after deal}} - ROA_{i, \text{at announcement}}}{ROA_{i, \text{at announcement}}}$
Δ Investment Rate	ΔIR	Change in the acquirer's ratio between CapEx and total assets	$\Delta IR_i = \frac{IR_{i, 1 \text{ year after deal}} - IR_{i, \text{at announcement}}}{IR_{i, \text{at announcement}}}$
<b>Fixed Effects</b>			
Year		Dummy indicating the year of observation	
Industry		Dummy indicating the macro industry which the firm operates in	

Source: Refinitiv Eikon

Note: The table provides definitions and descriptions of each control variable incorporated when investigating *Hypothesis 2* and *Hypothesis 3A* and *3B*

## Appendix 5

### Control Variable Rationale – *Hypothesis 2* and *3*

Variable	Rationale	Expected Sign
<b>Financial Variables Acquirer</b>		
$\Delta$ Size	Larger firms are often associated with better post-merger performance due to economies of scale and more resources (Moeller et al. 2005), potentially leading to a higher stock price (Rhodes-Kropf and Robinson 2008).	+
$\Delta$ Leverage	Higher leverage can increase the risk of financial distress and limit the firm's flexibility post-merger (Jensen 1986), possibly leading to a lower stock price post-merger (Andrade et al. 2001).	-
$\Delta$ Revenue	Increases in revenue may indicate successful post-merger integration and market acceptance (Healy et al. 1992).	+
$\Delta$ P/E	A higher P/E ratio might reflect growth expectations but also overvaluation risks (Damodaran 2005).	+/-
$\Delta$ Return on Assets	An increase in ROA suggests improved efficiency and profitability post-merger (Healy et al. 1992).	+
$\Delta$ Investment Rate	A higher investment rate may signal a firm's growth prospects and commitment to future development (Titman et al. 2004).	+

Note: The table outlines the expected signs and rationales for each control variable relevant to *Hypothesis 2* and *Hypothesis 3A and 3B*, supported by literature that details the associations

## Appendix 6

### Results of Efron's Bootstrap regressions

Dependent Variable	Premium							
	1		2a		2b		2c	
Model	Coef,	P>t	Coef,	P>t	Coef,	P>t	Coef,	P>t
Target ESG Score	0.002*	(0.093)						
Target E Pillar Score			0.001	(0.307)				
Target S Pillar Score					0.002**	(0.048)		
Target G Pillar Score							0.001	(0.493)
Size	-0.002	(0.908)	0.002	(0.919)	-0.002	(0.917)	0.006	(0.736)
Leverage	0.003	(0.980)	0.003	(0.978)	0.003	(0.981)	0.003	(0.979)
ROA	-0.602*	(0.052)	-0.587*	(0.054)	-0.621*	(0.056)	-0.565*	(0.061)
Investment Rate	-1.004**	(0.014)	-0.963**	(0.019)	-1.021***	(0.012)	-0.976***	(0.018)
P/B	0.109	(0.587)	0.105	(0.589)	0.082	(0.639)	0.112	(0.545)
Deal Value	0.000	(0.500)	0.000	(0.464)	0.000	(0.528)	0.000	(0.482)
Cash Financing	-0.017	(0.718)	-0.017	(0.725)	-0.015	(0.761)	-0.020	(0.699)
Multiple Bidders	0.033	(0.922)	0.016	(0.964)	0.017	(0.956)	0.039	(0.905)
Deal Advisors Target	-0.003	(0.953)	0.001	(0.983)	-0.007	(0.890)	0.002	(0.966)
Hostile	0.194*	(0.082)	0.208*	(0.072)	0.195*	(0.090)	0.192*	(0.102)
Toehold	0.0767*	(0.097)	0.079*	(0.088)	0.069	(0.118)	0.084*	(0.069)
Intercept	0.000	(0.999)	0.021	(0.894)	-0.002	(0.991)	0.007	(0.966)
Year Fixed Effect	Yes		Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes		Yes	
Observations	206		206		206		206	
Replications	1000		1000		1000		1000	
R <sup>2</sup>	0.137		0.130		0.143		0.127	
Adjusted R <sup>2</sup>	0.074		0.066		0.080		0.063	
Wald chi2	31.9		28.94		36.08		29.4	
Prob>chi 2	0.004		0.011		0.001		0.009	

Dependent Variable	Δ Acquirer ESG				Δ Acquirer Stock Price	
	3		4a		4b	
Model	Coef.	P>t	Coef.	P>t	Coef.	P>t
Target ESG/Acquirer ESG	0.010	(0.858)			0.022	(0.280)
Δ Acquirer ESG			0.176	(0.622)		
Δ Size	3.709	(0.622)	4.882	(0.223)	5.771	(0.132)
Δ Leverage	0.000	(0.996)	0.001	(0.983)	0.001	(0.976)
Δ Revenue	0.014	(0.944)	-0.106	(0.507)	-0.111	(0.415)
Δ P/E	0.023	(0.379)	0.038	(0.402)	0.041	(0.328)
Δ ROA	0.060*	(0.105)	-0.010	(0.822)	0.000	(0.996)
Δ IR	0.113	(0.430)	0.067	(0.639)	0.089	(0.510)
Intercept	-0.178	(0.073)	0.043	(0.691)	-0.004	(0.972)
Year Fixed Effect	Yes		Yes		Yes	
Industry Fixed Effect	Yes		Yes		Yes	
Observations	63		63		63	

Replications	1000	1000	1000
R <sup>2</sup>	0.213	0.199	0.196
Adjusted R <sup>2</sup>	0.080	0.063	0.059
Wald chi2	8.63	13.37	13.31
Prob>chi 2	0.472	0.147	0.149

## Appendix 7

### Results of the Breusch-Pagan Test

Model	1	2a	2b	2c	3	4a	4b
Chi2	9.37	7.88	8.07	8.43	61.37	0.12	0.44
Prob > chi2	0.0022	0.0050	0.0045	0.0037	0.0000	0.7257	0.5092
Heteroskedasticity	Yes	Yes	Yes	Yes	Yes	No	No

Note: A probability value (Prob > chi2) < 0.05 signals presence of heteroskedasticity. The table present the results in connected to the Breusch-Pagan Test

## Appendix 8

### Results of Variance Inflation Factor (VIF) Test

Model	1	2a	2b	2c	3	4a	4b
Target ESG Score	1.47				Target ESG/Acquirer ESG	1.02	1.02
Target E Pillar Score		1.44			Δ Acquirer ESG		1.26
Target S Pillar Score			1.39		Δ Size	1.53	1.56
Target G Pillar Score				1.21	Δ Leverage	1.58	1.58
					Δ Revenue	1.83	1.82
Size	1.60	1.60	1.51	1.45	Δ P/E	1.17	1.18
Leverage	1.06	1.06	1.06	1.06	Δ ROA	1.20	1.30
ROA	1.17	1.17	1.18	1.17	Δ IR	1.35	1.38
Investment Rate	1.13	1.13	1.13	1.13			
P/B	1.09	1.09	1.08	1.10			
Deal Value	1.31	1.31	1.31	1.32			
Cash Financing	1.18	1.18	1.18	1.18			
Multiple Bidders	1.05	1.06	1.05	1.06			
Deal Advisors Target	1.40	1.39	1.40	1.39			
Hostile	1.12	1.12	1.12	1.12			
Toehold	1.12	1.11	1.13	1.12			

Note: The table provides the results of the VIF tests applied on all econometric models utilised in this empirical report