Do Companies Value ESG?

An investigation of the potential relationship between ESG performance and deal premiums paid in acquisitions.

By

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Abstract

This paper sheds light on companies' valuation of ESG performance by examining the potential impact that the ESG-score of the target firm has on bid premiums in Mergers & Acquisitions (M&A). While extensive research has been conducted on sustainable investing, no consensus regarding the influence of ESG performance on M&A activities has been reached. With a sample of 224 deals completed on the Northern European market between 2002-2022, various aspects of the ESG effect on deal premiums are evaluated through several regression models. The study could not conclude a significant relationship between ESG performance and deal premiums; however, a few other findings were obtained. Notably, when dividing the sample into subsamples of two different time periods, the more recent subsample (2015-2022) exhibited a negative relationship between all ESG aspects and the deal premium. This result suggests that acquirers tend to value ESG performance lower than the market in recent years, supporting the shareholder view that objectives to invest in other matters than shareholder wealth are valued negatively in later years contrary to previous years. In addition, no evidence that the ESG performance of the acquiring company had a significant impact on the willingness to pay more to acquire better ESG performance was found. Therefore, this study shows that, over time, ESG has not been a significant driver of acquisition premiums; however, it supports the notion that in recent years, companies do not value ESG as high as the market in mergers and acquisitions.

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1.0 Introduction

Sustainable finance has become increasingly important in today's financial markets. The European Commission (n.d) defines sustainable finance as:

.. the process of taking environmental, social and governance (ESG) considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects (EC, n.d, p.1).

Evidently, ESG is considered a core aspect within the broad definition of sustainable finance. The environmental pillar of the ESG measure broadly includes factors that may affect the climate in a negative manner, such as pollution. The social aspects do often include fundamental human rights and the process of eliminating inequality and investing in human capital. Lastly, the pillar governance is essential in enabling successful environmental and social actions as it refers to the company management structures as well as the general corporate governance of the enterprise (EC, n.d). The increase in importance regarding ESG is evident from the European Green Deal and the European Commission's strategy to make Europe climate-neutral. Following the European Green Deal Investment Plan, approximately €1 trillion will be assembled for sustainable investments in 2020-2030 (EC, 2020). Moreover, the universe of sustainable investments has grown 25-fold from 1995 to 2020 in the United States alone, representing a yearly growth rate of 14 percent (US SIF, 2020).

As the sustainable finance universe seems to grow rapidly, much literature covering the implications of sustainable investing also proliferates. The corporate social responsibility (CSR) of businesses has broadly resulted in two opposing views, the shareholder view and the stakeholder view. The shareholder view was established by Friedman (1970) and questions the rationale behind imposing responsibilities on corporations. Friedman argues that imposing a social duty on a corporation indirectly means that it forces the executive of that company to not act in the best interest of the shareholders. He expands this argument by saying that investing capital into something that does not generate financial gains means that the executive is spending shareholders' money on a social interest that does not necessarily correspond to their objectives. Therefore, Friedman argues that the only responsibility a business has is to increase its profits. The opposing stakeholder view was originally established by Freeman (1984), who argued that companies should strive to create value for

all stakeholders. These stakeholders are, according to Freeman (1984, p.vi), "... any group or individual who can affect, or is affected by, the achievement of a corporation's purpose". Porter and Kramer (2006) further expand the stakeholder view by arguing that there exists a strong relationship between society and corporations, which today's CSR initiatives fail to understand. They argue that CSR initiatives should be analyzed and decided using similar value-chain practices as ordinary business actions. In that way, CSR may become increasingly important to establish competitive advantages generating actual corporate gains.

The existing literature has failed to provide consistent evidence of which of the two theories holds regarding socially responsible initiatives. Mergers and acquisitions (M&A:s) may provide the research with an interesting perspective on how corporations value sustainable actions. M&A decisions are among the most essential and crucial actions a company may take; thus, an extensive due diligence process is often preceded. Therefore, observing how companies value social responsibility may reflect a more pertinent inference than only observing retail investors' decisions. Suppose the objective is to observe how corporations value ESG. The rational choice is then to observe if the acquisition premium is higher or lower concerning the targets' or acquirers' ESG performance.

There is some existing literature examining the potential association between ESG-scores and M&A premiums. The research regarding the ESG-performance of the target firm and the acquisition premium is limited and not extensively researched. Gomes and Marsat (2018) report a significant positive relationship between CSR score and acquisition premium, implicating that firms pay more for firms that are better at CSR. Jost, Erben, Ottenstein, and Zülch (2022) presented an alternative view that found no significant association between ESG performance and M&A premium. Jost et al. (2022) further developed their research regarding the ESG-performance of the acquirer and the acquisition premium but did once again find no significant relationship. However, they observed a significant negative association between the quality of the governance aspect and the acquisition premium. Regarding the acquirer's perspective, an opposing view is presented by Krishnamurti, Shams, Pensiero, and Velayutham (2019), who found a negative relationship between CSR performance and acquisition price. As evident from the discussion above, the previous literature regarding this subject is limited to a few reports, and the results from those papers are inconclusive. Therefore, there is a need for further research on this subject.

To our knowledge, there is, at this moment, no other research that investigates the potential relationship between the ESG-performance of the target and the acquisition premium in Northern Europe. The geographical limitation is interesting as many of the Northern Europe countries are considered world-leading concerning sustainability. With this discussion in mind, this thesis will investigate the potential relationship between the ESG-score and the acquisition premium in different dimensions. First, the relationship between the target ESG score and the acquisition premium will be examined, as well as the impact of each pillar. Also, the effect of the acquirer ESG score on the premium and the interaction between the target and acquirer ESG score will be explored to investigate how acquirers value a possible improvement of their own ESG score. The sample consists of 224 deals, and the period of investigation is between 2002-01-01 to 2022-01-01, with one hypothesis investigating subsamples of different periods to review how this relationship has developed over time.

The main finding of this study is that there is no significant relationship between the ESG score and the acquisition premium, indicating that acquirers do not immediately value the ESG performance of the target as reflected by the acquisition premium. Neither did any of the individual pillars of ESG exhibit any significant relationship with the deal premium; however, the relationship appears to be slightly enhanced in cross-border acquisitions. Despite the insignificant relationship between ESG and the deal premium for the complete sample, a statistically significant relationship could be proven in more recent years. When dividing the sample into two subsamples of different periods, the sample containing deals from 2015 to 2022 displayed a negative association between the ESG score and the deal premium. This finding holds for all individual pillars of the ESG score and may indicate that ESG is valued more conservatively by acquirers than by the market in recent years.

The remainder of this thesis will have the following disposition; section 2 will account for the general theory around M&A:s and previous literature regarding how ESG performance might affect acquisition premiums. Section 3 will present our empirical hypotheses and provide the reader with our expectations of the results. Section 4 will outline the data collection, and section 5 the method employed to obtain results. Section 6 will present the empirical findings and a discussion of the results. Lastly, section 7 will conclude this work and suggest what further research we consider vital to fill the gaps in the existing literature.

2.0 Literature Review

This chapter aims to provide an overview of the general theory of mergers and acquisitions and what drives deal premiums and creates value in M&A. This will lay the foundation for the hypotheses and analysis as linked to ESG motives. Then, a literature review outlining the existing literature related to the subject will be provided to attain an insight into the relationship between ESG performance and M&A.

2.1 M&A Theory

In existing literature regarding the motives of mergers and acquisitions, there are two main categories of motives for engaging in such activities; economic motives and motives relating to market imperfections. Economic motives include potential synergy effects and market power obtained by acquiring or merging with another firm. In contrast, market imperfections primarily relate to information asymmetries and the market for corporate control.

Synergy gains are one of the most common arguments for undertaking M&A activity and are captured when the value of two firms combined is greater than the value of the individual firms (Jensen & Ruback, 1983). These effects may arise from cost reductions and increased capital efficiency due to economies of scale and economies of scope (Andrade, Mitchell & Stafford, 2001). The other aspect of the economic motives concerning market power relates to gains that emerge from a strengthened position on the market in terms of reduced competition and pricing power against customers and suppliers (Seth, 1990). Even though substantial literature suggests that these synergies or market power increments are often overestimated or not fully capitalized on, the perceived synergies affect the premium paid in mergers and acquisitions (Díaz, Sanfilippo & López, 2013; Krishnan, Krishnan & Lefanowicz, 2009).

The other main category of M&A motives relates to the exploitation of market imperfections and information asymmetries. Information asymmetries stem from the fact that the target firm's management plausibly possesses an information advantage over the acquirer of their own firm's intrinsic value. This causes a complex situation for the bidders where it is difficult to correctly assess the actual value of the target firm, potentially rendering an adverse selection. This is similar to the *market for lemons* situation proposed by Akerlof (1970), where the "good" targets self-select out of the market while "bad" targets are incentivized to

convince the buyer that it is good. Cheng, Li, and Tong (2016) also conclude that the degree of information asymmetry of the target firm positively correlates with the bid premium. The authors derive this from the finding that markets tend to undervalue firms with a lower level of disclosure, consistent with previous research concluding that equities characterized by higher information asymmetry are often valued at a discount (e.g., Glosten & Milgrom, 1985). Therefore, when the acquirer has conducted their due diligence, the bid is usually at a premium compared to their current market value.

A mechanism for governing low-quality firms is the *Market for Corporate Control*, presented by Manne (1965). It states that firms that are run inefficiently, as reflected in a deteriorating share price, become more attractive for a takeover. This is due to the fact that the value of control increases if the bidder successfully can implement improvements, thus affecting the bid premium.

2.1.1 Deal Specific Variables

While the general theory accounted for above gives a comprehensive overview of how deal premiums are determined, there are several deal-specific variables relating to the theory that affect the premium paid in M&A deals. These variables are largely developed and approved by previous researchers and have significant impacts on the deal premium, making them suitable for usage as control variables.

The first variable considered is the size of the target firm. Zhang (2019) proposed that the size of the target in most instances corresponds to the complexity of a company's structure and its operations. Thus, larger firms are more likely to have high integration costs and lower potential of realizing the synergies targeted, warranting a lower acquisition premium. Large firms are generally characterized by less information asymmetry, reducing the risk of being undervalued (Draper & Paudyal, 2008). Therefore, the size variable is expected to affect the deal premium negatively. Also, Gomes and Marsat (2018) found that capital expenditures (CAPEX) can affect the deal premia since a high CAPEX of the target firm indicates that synergies might be more realizable.

Continuing with information asymmetry, variables that imply high information asymmetry are expected to show a positive impact on the deal premium, while variables indicating mitigation of information asymmetry are expected to affect the premium negatively, in line

with previous research. Therefore, a variable to consider is whether it is a cross-border deal, which should command a higher bid premium due to increased information asymmetry (Mantecon, 2009). Furthermore, the target market-to-book value is useful for identifying mispriced firms and may also reflect a company's investment opportunities. Bergerés, Dionne, and La Haye (2015) therefore conclude that there is a dependence between the market-to-book and the deal premium, but that the sign of the relationship may vary depending on how the ratio is perceived. Another factor that may reflect the degree of information asymmetry in M&A is if the deal is within the same industry or cross-industry. Cross-industry deals may be characterized by more information asymmetries, which may also entail higher perceived synergies. A variable that could reduce the information asymmetry is a blockholder variable that considers if the acquirer held considerable shares in the target company before the acquisition. The rationale for this variable is that a company that already owns parts of the target company is likely to have more information about the target, thereby reducing the risk of mispricing (Bergerés, Dionne, & La Haye, 2015).

Furthermore, deal premiums are primarily determined by target firm performance measures of their financial position. Such measures include, for instance, leverage ratios, where a highly leveraged company would command a lower premium (Bergerés, Dionne, & La Haye, 2015). Also, the return on assets and revenue growth can be seen as an indicator of good performance, thereby warranting a higher bid premium. Also, the stock performance running up to the announcement may induce a higher bid premium for the acquirer, in accordance with the "Markup Effet" (Schwert, 1996). This theoretical framework lies as a foundation for the control variables included in this thesis, which are accounted for in section 4.4.

2.2 ESG-score and M&As

In this section, the literature regarding how ESG-scores might affect the M&A acquisition price and announcement effect is accounted for. The theoretical foundation that the previous research often is based upon is, as mentioned in section one, the shareholder theory by Friedman (1970) and the stakeholder theory by Freeman (1984). Friedman's shareholder theory argues that corporations' sole purpose and objective should be to maximize shareholder wealth. According to this view, ESG initiatives by the target firm should have a negative impact on the acquisition premium. The opposing view presented by Freeman (1984) argues that if CSR initiatives are analyzed as ordinary business actions, they may

generate actual corporate gains through competitive advantages. Therefore, according to the stakeholder theory, the relationship between the ESG-score of the target and the acquisition premium should be positive. A more extensive discussion of the expectations of the results is outlined in section three of this thesis. The remainder of this section will have the following disposition; the first two under-sections will outline previous empirical research on how the acquisition price is affected by the ESG-score of the target and then the acquirer. The last paragraph will lay out the announcement effects and its relationship with ESG to account for the perspective of value creation.

2.2.1 ESG-Score of Target and the Acquisition Premium

In Chen and Gavious's (2015) article, the authors investigate if CSR performance affects the acquisition price in the Israeli market. The research is based on 134 transactions during 2007-2012, in which 1 percent of the outliers were winsorized. The authors could not conclude any relationship between the acquisition price and socially responsible firms and proposed that M&A investors believe that CSR performance is not correlated with profit potential. An opposing view is presented by Gomes and Marsat (2018). The authors investigate the potential impact of the performance of CSR of the target firm on the acquisition premium of M&As. The sample of deals that the authors use is 588 deals worldwide between the period 2003-2014; however, as the deals were collected worldwide without any geographical restrictions, 36.9 percent of all targets were US deals. This research showed that CSR had a significant positive impact on acquisition premiums. They did, however, notice that the social pillar of the CSR score only had a significant impact in terms of cross-border deals. Similar to Chen and Gavious (2015) but as opposed to Gomes and Marsat (2018), Jost et al. (2022) looked at the relationship between the acquisition premia and CSR score for both the target- and acquirer firm. The investigation was conducted with a sample of 449 deals from the perspective of the target firm and 1598 deals for the acquiring firm. The deals are from an international sample between the years 2003-2018. From the target perspective, the researchers concluded no significant relationship between ESG-score and the acquisition premium.

2.2.2 ESG-Score of Acquirer and the Acquisition Premium

In the article by Krishnamurti et al. (2019), the authors could conclude a statistically proven negative association between the acquisition price and the CSR performance of the acquiring firm. The research was conducted on 771 acquiring firms in the Australian market from 2000

to 2016. Besides the research on bid premiums, the authors concluded several other consequences of M&A decisions based on the acquiring firms' CSR score. These results were that acquiring firms with high CSR-score often; base their choice of the target company on the CSR performance of the target, use cash only offers more often, and the announcement abnormal return is significantly higher. In contrast to their results, Hussaini, Hussain, Nguyen, and Rigoni (2021) found a positive connection between high acquisition premium and high CSR scores. The study was conducted on a sample of 564 deals in the United States between 1992-2014. Therefore, the authors argued that their finding is consistent with Milton Friedman's shareholder theory. Jost et al. (2022) introduced a third opinion, which found no significant relationship between M&A premiums of acquirers and CSR performance. However, they found that the governance quality for the acquirer has a significant negative association with the acquisition premia.

2.2.3 ESG-Score and the Announcement Effect

Aktas, Bodt, and Cousin (2011) conducted a study in which they looked at the potential association between SRI performance of the target firm and abnormal returns regarding the announcement effect. The study was conducted on 106 M&A deals in the period of 1997 and 2007. The authors found a positive association between the SRI performance of the target firm and the gains of the acquiring firm and concluded that the SRI performance for the target was value-creating for the acquirer. Furthermore, the study also reported that firms with better social and environmental risk practices tended to realize more considerable gains following the acquisition. Another finding of the study is that there is a learning effect of the acquiring company. They found that an acquirer who bought a socially responsible firm subsequently improved their environmental and social scores following the acquisition. Somewhat contrary, Wang, Lu, and Liu (2021) found a negative connection between targets who overinvest in their CSR and the announcement effect. The study was conducted between 1996-2017 in a US sample. The overinvestment factor is defined as a tipping point where the efficiency of the CSR investments starts to decline. It is important to note that this perspective is not perfectly similar to Aktas, Bodt, and Cousin (2011).

From the acquirer's perspective, Deng, Kang, and Low (2013) investigated the potential effect a high CSR score for the acquiring firm may have on the announcement returns. The study was based on 1556 deals in the US between 1992 and 2007. It reveals that a high CSR performer has significant positive effects on both the stock returns and the long-term returns.

Furthermore, they also found that the long-term operating performance was significantly improved after the deal's completion. However, an opposing view is presented in the article by Yen and André (2019). The authors could conclude that the relationship between the market announcement effect of an acquisition and the CSR performance of the acquirer is not clear as it depends on different expectations and concerns regarding the cost-benefit of the CSR performance. This study was on a total deal sample of 1986 deals based on 743 acquirers from 23 different emerging markets.

3.0 Hypotheses

This section will outline the hypotheses that are formulated to investigate the aim of this thesis formally. The hypotheses are formulated in the light of the theoretical framework, and previous research is accounted for in chapter 2. The hypotheses constitute the structure of the continuation of this thesis and will create multiple avenues for further discussion.

3.1 Hypothesis 1

Hypothesis 1a: There is a significant positive relationship between the ESG-score of the target firm and the acquisition premium.

As evident from section 2, there is no unambiguous result regarding whether ESG-scores affect the acquisition premium. The papers that have investigated the potential relationship between the ESG-score of the target firm and the acquisition premium did not provide the existing research with any clarity as Gomes and Marsat (2018) found a significant positive relationship while neither Jost et al. (2022) nor Chen and Gavious (2015) found any significance. However, in accordance with Gomes and Marsat (2018), the expectation is that there is a positive association. This hypothesis can be linked to the M&A theory accounted for above. Since a common motive for M&As is the synergy effect, it is being hypothesized that good social and governance practices should lead to smoother implementations and realizations of the synergy effects, as consistent with Aktas, Bodt, and Cousin (2011), who, in addition, found a positive relationship between synergy gains and environmental aspects. Accordingly, this should command a higher premium. Moreover, as ESG can be seen as a risk mitigant, shielding both environmental risks as well as risks of facing lawsuits and ESG-related controversies, acquiring firms should value this with a higher bid premium.

Hypothesis 1b: There is a significant positive enhancement of the relationship between the ESG-score of the target firm and acquisition premium in cross-border deals.

This hypothesis is based on a theoretical basis regarding information asymmetry. As Cheng, Li, and Tong (2016) write, information asymmetry is correlated with a lower market valuation, which could indicate an undervaluation and, therefore, a reason for a higher bid

premium. It is reasonable to expect that the amount of information asymmetry in cross-border deals should be more significant than in deals performed in the same country. Furthermore, Gomes and Marsat (2018) found a significant positive relationship between the social pillar in ESG and cross-border deals. They argue that due to the complexity and uncertainty of cross-border deals, the performance regarding the social factor of ESG should become increasingly important. As the social pillar naturally has a considerable weight in the ESG-score, the incremental effect of ESG on the premium paid in cross-border deals should be positive. Thus, hypothesis 1b is based on both information asymmetry rendering in a market undervaluation and the increased importance of the social pillar.

3.2 Hypothesis 2

Hypothesis 2a: There is a significant positive relationship between the environmental pillar of the target firm and the acquisition premium.

The environmental aspect is expected to impact the acquisition premium positively. This ties back to the discussion in hypothesis 1a, where the overall ESG score is expected to have a positive relationship with the acquisition premia, partly due to the potential risk mitigation property of high environmental standards. This may include the ability to cope with environmental risks, such as regulatory risks as well as litigation risks. Also, Aktas, Bodt, and Cousin (2011) found that the expected synergies increase with a firm's environmental performance, and the premium paid should increase accordingly. Therefore, it is posited that better environmental practices will increase the acquisition premium.

Hypothesis 2b: There is a significant positive relationship between the social pillar of the target firm and the acquisition premium.

In similarity to the environmental aspect, the social aspect of the ESG score is hypothesized to have a positive relationship with the acquisition premium. This follows previous research (e.g., Gomes and Marsat, 2018; Aktas, Bodt, and Cousin, 2011), which found that acquisitions involving a target with good social practices tended to realize more considerable gains following the acquisition. This can be linked to the theory of synergies, where good

social and organizational administration can lead to better implementation processes, thus making synergies more realizable. Also, these researches showed that better social practices could act as alleviators of risk. Therefore, the social dimension of ESG is expected to correlate with the acquisition premium positively.

Hypothesis 2c: There is a significant negative relationship between the governance pillar of the target firm and the acquisition premium.

The last part of this hypothesis states that there should be a negative relationship between governance and the acquisition premium, somewhat contrasting to the general hypothesis that the overall ESG score will positively affect the deal premium. The theoretical basis which this hypothesis is based upon is the market of corporate control by Manne (1965). The market for corporate control proposes that inefficient firms should be more attractive for takeovers due to the possibility of more easily implemented improvements. The attractivity and the value of control should, therefore, be reflected in a higher acquisition premium. However, Jost et al. (2022) obtained no significant relationship between the governance of the target firm and the premia. However, this hypothesis will be based upon the theoretical framework previously accounted for; thus, high governance for the target firm should have a negative relationship with the deal premia.

3.3 Hypothesis 3

Hypothesis 3: There is a stronger relationship between the ESG of the target and the acquisition premium in later years, contrary to previous years.

Hypothesis 3 is a reflection of the growing concern for sustainability-related matters and the attentiveness of the financial industry to sustainable investing. As evident from the introduction, having a sustainable profile and preceding and indemnifying against sustainability risks has become an increasingly important question for corporations. Therefore, it is hypothesized that companies are increasingly willing to pay an additional premium to ensure a better sustainability profile. Therefore, the hypothesis is that ESG is a stronger driver of acquisition premiums in more recent years than previously.

3.4 Hypothesis 4

Hypothesis 4a: There is a negative relationship between the ESG-score of the acquirer and the acquisition premium.

Lastly, the effect of the acquirer ESG score on the acquisition premium will be evaluated. It is hypothesized that there is a negative relationship between the acquirer's ESG score and the acquisition premium, i.e., that acquirers with good ESG performance will pay a lower premium in acquisitions. This hypothesis is supported by previous research, which has found that firms with better ESG practices are, on average, creating more shareholder value in acquisitions as measured by abnormal returns and long term increases in operating cash flows (Deng, Kang & Low, 2013; Aktas, Bodt & Cousin, 2011). This suggests that companies which incorporate various shareholder interests, such as ESG practices, in their M&A decisions are less likely to overpay in acquisitions. This intuition was assessed by Krishnamurti et al. (2019), who concluded that socially responsible firms, on average, pay less in acquisitions, consistent with the stakeholder view. While Hussaini et al. (2021) attained contrasting results, this hypothesis reflects the theoretical framework developed, suggesting that firms with high-quality governance and awareness of ESG risks are less prone to undertake value-destroying acquisitions, implying a lower bid premium.

Hypothesis 4b: Acquirers with low ESG-score are willing to pay more for targets with high ESG-score.

Following the discussion in hypothesis 3 and the introduction, it is clear that a company's sustainability has become an important matter, both for reputational purposes and for mitigating ESG-related risks. However, the literature is somewhat torn between the shareholder view and the stakeholder view, which argues whether engaging in CSR activities is value-creating or value-destroying. Hussaini et al. (2021) emphasize the shareholder view by stating that a better CSR performance of the acquirer positively correlates with a higher bid premium, indicating that the CSR engagements are at the expense of the shareholders. On the other hand, Krishnamurti et al. (2019) found conflicting results, suggesting that the better the CSR performance of the acquiring firm, the lower the bid premium. Furthermore, there is

certain evidence indicating that a company that acquires a good ESG performing enterprise has gained significant abnormal returns, both upon announcement as well as in the long term (e.g., Aktas, Bodt, and Cousin 2011; Deng, Kang, and Low 2013). This would suggest that ESG is desirable for financial performance and that the learning effect found by Aktas, Bodt, and Cousin (2011) could potentially benefit companies with poor ESG performance more, thus warranting a higher bid premium. Therefore, it is hypothesized that a company with a low ESG score will be willing to pay a higher premium for a target with a good ESG performance.

4.0 Data

This section will provide an overview of the data collection methodology and the general screening criterion underlying the sample selection and construction process. First, the platform used for acquiring financial data will be accounted for, then the ESG data will be described to provide an insight into the underlying definition of the ESG measure used. Lastly, the complete sample, including the control variables used, will be accounted for, as well as delimitations and assumptions made for this study.

4.1 Financial Data

The primary source used for collecting financial data has been Refinitiv Eikon, with complementary data for individual firms from Bloomberg. The Eikon platform has recorded more than 1,2 million M&A deals from 1970 to the present, with more than 1000 data elements for both acquirers- and target information and deal-specific variables (Refinitiv, n.d.). This enables the user to customize a screen where requested criteria are taken into account. From Refinitiv, all financial data, such as the deal premium and control variables, have been collected as well as deal-specific information such as target and acquirer domicile and industry. To complement missing data points from Refinitiv, some additional data has been retrieved from Bloomberg.

4.2 ESG Data

ESG data has been retrieved from Refinitiv Eikon as well. Eikon has an extensive database that has recorded ESG scores from 2002 and now covers more than 80% of the global market capitalization (Refinitiv, 2021). The scoring methodology of Eikon is data-driven and is assembled from reports such as company reports, analysts, and news reports. This yields over 500 data points that ultimately comprise a score for the three pillars of the ESG measure and an overall ESG score (Refinitiv, 2021).

The scoring methodology of Refinitiv is quantitatively focused as the final ESG scores are calculated based on a large quantitative data set. The data points consist of both absolute values of different metrics as reported by the company as well as Boolean data[1] to identify corporate actions to secure better ESG performance. The data is then benchmarked against other companies with a percentile rank based on how many companies perform better or

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[1] Data that can take on the values "True" or "False".

worse regarding each metric. The environmental and social aspects are benchmarked against the company's industry group, while the government aspects are benchmarked against the company's country, as it is found to be more relevant for comparing governance practices. The percentile rank scoring produces a more comparable score and reduces the effect of outliers. Also, the measure takes the level of reporting of various metrics into account to penalize companies that do not disclose their ESG activities. Then, Refinitiv assigns weights to the three pillars of the ESG scores corresponding to the importance of the specific ESG theme in different industries. Accordingly, a normalized ESG score is created on a scale from 1 to 100 that objectively considers the ESG actions of a company (Refinitiv, 2021).

It is of importance to note that assigning a company an ESG score is not strictly an arbitrary task. Previous research suggests that the results may vary depending on which source is used for collecting the ESG scores. Dorfleitner and Halbritter (2015) stress the importance of using several ESG providers if possible since they found somewhat dissonant results in their study when considering ESG scores from three providers.[2] This is a result of the fact that different providers consider various metrics and have different ways of assessing the scores. It should also be noted that these scores are primarily based on company reports, meaning that they are to some extent influenced by company discretion. However, as Refinitiv objectively assigns an ESG score based on over 500 data points and penalizes companies that do not report on important metrics, a comprehensive and reliable evaluation can be made based on the Refinitiv Eikon ESG scores.

4.3 Sample Selection

Since this thesis aims to study how ESG affects the deal premia in mergers and acquisitions in the Northern European market, the first screening criteria was to sort out all deals that have taken place in this region, i.e., where both target and acquirer are registered in Northern Europe. This geographical delimitation has been chosen circumspectly to represent a relatively homogenous market in a region that is oftentimes considered to be at the forefront of sustainable development. The time frame selected is 20 years, between January 2002 - January 2022, since Refinitiv started recording ESG scores in 2002, and an extended sample period that takes recent years into account yields a larger sample size.

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[2] ASSET4, Bloomberg & KLD

When screening for deals that have taken place in this period in Northern Europe, only completed deals and acquisitions where the target was public at the time of the acquisition have been considered due to more disclosure of financial information. Also, in line with previous research, only deals where the rank value (including the net debt of target) is above $1M has been selected. Then, deals where the acquisition premium, as calculated four weeks prior to the announcement of the acquisition, is missing have been removed. The reason for using the premium based on the share price four weeks prior to the announcement is to remove potential rumors- and insider trading effects, consistent with previous literature. Finally, out of this sample consisting of 1909 mergers and acquisitions, deals where the target is missing an ESG score one year prior to the acquisition date were removed. Again, the reason for selecting the ESG scores from one year prior to the acquisition is to remove potential bias from the target company to improve its ESG to make itself a more attractive target. When having all these criteria met, the final sample consists of 224 deals, whereof 30 are cross-border deals.

4.4 Control Variables

For the purpose of this thesis, a set of control variables has been employed to account for their effects on the acquisition premium and detach their effect on the variables of interest. These variables are selected in accordance with theory and the previous research accounted for in chapter 2, with slight modifications to accommodate availability. First, a set of firm-specific control variables concerning company performance, characteristics, and financial strength of the target company are included to explain a portion of the acquisition premium paid. The first variable selected is a size variable, defined as the natural logarithm of the market cap of the target company. Second, the Price-to-Book ratio is included to capture the effect of potential undervaluation on the market and a leverage ratio defined by total debt to total assets. Return on assets (ROA) has also been included to identify well-performing companies and revenue growth, calculated as the annual revenue growth of the three fiscal years prior to the acquisition. CAPEX has also been taken into account and scaled by total assets of the target company for comparability. Furthermore, a runup variable defined as the target stock return between 4 weeks prior to the announcement and one day prior to the announcement is incorporated as it constitutes an extra cost for the bidder.

Lastly, a set of dummy variables is utilized to capture deal-specific characteristics affecting the acquisition premium. A cross-border dummy variable that captures the effects of cross-border acquisitions, and a dummy variable that takes on the value one if the acquisition is within the same industry, denoted *Related*. Then there is a Block-holder dummy that takes on the value one if the acquirer held more than five percent of the target company prior to the acquisition, as such transactions should be characterized by less information asymmetry. Lastly, a dummy variable for cash payments is included, which takes on one if the acquisition is paid in all cash. This aligns with the theory that cash payments should commend a higher premium due to tax effects. Apart from these control variables, fixed effects for the target country, industry, and deal year are also included for robustness purposes.

Table 4.1: *Control Variables*

Control Variable	Abbreviation	Definition	Expected Sign
Size	Size	Natural logarithm of the market cap	-
Price-to-Book Ratio	P/B	Price divided by book value of equity	+ / -
Leverage	Lev	Total debt divided by total assets	-
Annual Revenue Growth	g	Annual revenue growth from 3 years prior to the acquisition	+
Return on Assets	ROA	Net income divided by total assets	+
Capital Expenditures/Total Assets	CAPEX	CAPEX normalized by total assets	+
Runup	Runup	Share price of target one day prior to announcement divided by share price of target 4 weeks prior to announcement	+
Cross-border deal	CB	Dummy variable for cross-border deals	+ / -
Percentage of Cash in Deal	CASH	Dummy variable for deals paid in all cash	+
Percentage held by acquirer prior to deal	BH	Dummy variable for deals where acquirer held >5% of the shares in the target prior to the announcement	-
Related	Related	Dummy variable for acquisitions within the same industry	+ / -

The table reports the control variables used in the regressions (a vector denoted ψ), the abbreviations used in the reporting of the results in section 6, the definition of the control variables, and the theory-based expected signs.

4.5 Sample Overview

The concluding section of the data description chapter will provide a brief overview of the sample, including target and acquirer nation and industry, as well as some general descriptive statistics for the control variables included.

In the sample, consisting of 224 deals that have taken place in the Northern European market, the vast majority of the targets are listed in the United Kingdom, accounting for approximately 62% of the total deals. Target firms from Sweden and Norway represent a similar share in the sample, together accounting for 22% of the deals. Then, the relative frequency of the rest of the countries follows a declining pattern following the scale of the economy, where targets from Ireland, Finland, and Denmark together make up approximately 12,5% of the total deals. At the same time, the smallest economies, Iceland, Jersey, and Guernsey, together account for 2,5% of the sample. The distribution of acquirers by nationality is in principle analogous to that of the target nations, except for Jersey, which has been on the acquiring end considerably more times with a relative frequency of 4% of the total sample as acquirer. The sample distribution is in agreement with the relative preference for domestic acquisitions as opposed to cross-border acquisitions, where the sample consists of 87% domestic transactions. A full display of the country distribution and the frequency of domestic contra cross-border deals can be viewed in the table below.

Table 4.5.1: *Target & Acquirer nation with sample distribution*

Country	Target	% of total	Acquirer	% of total	Domestic Deals	% of total	Cross-border Deals	% of total
United Kingdom	138	61,61%	135	60,27%	127	56,70%	11	5%
Norway	27	12,05%	24	10,71%	21	9,38%	6	3%
Sweden	25	11,16%	26	11,61%	22	9,82%	3	1%
Ireland	12	5,36%	11	4,91%	10	4,46%	2	1%
Finland	9	4,02%	7	3,13%	5	2,23%	4	2%
Denmark	7	3,13%	5	2,23%	5	2,23%	2	1%
Guernsey	4	1,79%	5	2,23%	3	1,34%	1	0%
Iceland	1	0,45%	2	0,89%	1	0,45%	0	0%
Jersey	1	0,45%	9	4,02%	0	0,00%	1	0%
Total	**224**	**100%**	**224**	**100%**	**194**	**87%**	**30**	**13%**

This table reports the geographical distribution of the sample by both target and acquirer, while also reporting the fraction of domestic versus cross-border deals.

Regarding the industry distribution in the sample, there is a slight bias towards financial firms, especially considering the acquirers. As the classification is based upon Refinitiv's macro industry classification, some of the financial acquirers are actually holding companies. Thus, all financial acquirers are not pure financial companies. It is to be noted that some M&A studies choose to exclude financial firms from the sample. This is based on the assumption of Fama and French (1992) that financial firms have different firm characteristics and that measures such as leverage ratios can have different meanings than for non-financial firms. However, this study has chosen to include financial firms, in line with, e.g., Aktas, Bodt, and Cousin (2011) and Jost et al. (2022), and to account for these effects via the inclusion of several control variables and robustness tests. Otherwise, the target industry is relatively evenly distributed, where Real Estate, Industrials, and High Technology are the following most frequent industries. In table 4.5.2, the industry distribution for both target and acquirer is displayed to provide an overview of the sample.

Table 4.5.2: *Target & Acquirer industry with sample distribution*

Industry	Target	% of total	Acquirer	% of total
Consumer Products and Services	14	6,25%	5	2,23%
Consumer Staples	17	7,59%	11	4,91%
Energy and Power	18	8,04%	11	4,91%
Financials	47	20,98%	139	62,05%
Healthcare	9	4,02%	1	0,45%
High Technology	22	9,82%	7	3,13%
Industrials	24	10,71%	7	3,13%
Materials	14	6,25%	7	3,13%
Media and Entertainment	12	5,36%	8	3,57%
Real Estate	23	10,27%	14	6,25%
Retail	11	4,91%	5	2,23%
Telecommunications	13	5,80%	5	2,23%
Government and Agencies	0	0,00%	4	1,79%
Total	**224**	**100%**	**224**	**100%**

This table reports the industry distribution by both target and acquirer, including the relative frequency.

Considering the time distribution, the sample follows a cyclical pattern, where the number of deals increased leading up to the financial crisis of 2008 to then decline rapidly. However, most transactions have taken place in recent years, possibly partly due to favorable market conditions but also most likely due to increased sustainability reporting among corporations.

Therefore, 50% of the observations are collected from 2015 and onwards, which explains our division of periods for Hypothesis 3, where the first subsample spans from 2002 to 2015 and the other from 2015-2022.

Table 4.5.3: *Time Distribution of Sample*

Years	Number of deals	Proportion (%)	Average ESG	Average Social	Average governance	Average Environmental
2003	1	0,45	60,68	76,13	26,46	67,53
2004	4	1,79	37,79	38,11	36,26	22,58
2005	2	0,89	31,94	31,18	27,96	12,59
2006	10	4,46	47,23	46,77	49,14	37,78
2007	17	7,59	36,55	36,5	38,76	30,3
2008	19	8,48	45,57	45,86	47,88	44,74
2009	9	4,02	54,8	55,82	57,76	70,62
2010	10	4,46	49,49	49,85	51,11	55,94
2011	13	5,8	52,09	52,58	55,84	55,33
2012	9	4,02	45,94	45,64	42,96	51,83
2013	2	0,89	39,86	39,38	35,71	42,85
2014	8	3,57	47,98	48,81	50,28	51,77
2015	11	4,91	52,04	52,12	49,56	54,84
2016	8	3,57	31,4	31,69	28,79	34,77
2017	12	5,36	45,7	45,69	46,25	46,62
2018	16	7,14	40,04	39,28	36,99	26,11
2019	22	9,82	46,89	46,83	45,11	36,45
2020	19	8,48	49,66	49,29	49,59	39,01
2021	32	14,29	49,31	48,99	49,33	38,74
Total	**224**	**100**	**45,53**	**46,34**	**43,46**	**43,18**

This table displays the time distribution of the sample, including both the number of deals, the relative frequency, and the average ESG score in every particular year. The bottom row denotes the total for the first two columns, and the average score for the remaining columns. This table may provide the reader with an overview of the change in ESG-performance over the period of the sample.

Lastly, a descriptive statistics summary table for all variables included is provided in Table 4.5.4. In this table, the number of observations, mean, median, standard deviations, minimum, and maximum can be viewed for each variable. Notably, there is some variation in the premiums, as seen by the standard deviation, minimum, and maximum. However, the mean and the median lie relatively close to each other, indicating that the data is adequately equally distributed. As shown in Table 4.5.4, some of the control variables have peculiar maximum values. The Leverage variable has a maximum of 1.64, which is questionable as

the total debt should not be able to exceed total assets. Furthermore, the maximum value for the Price-to-Book ratio is 177.19, which is high as well. However, as the mean and median is relatively close for both the P/B and Leverage variable, the outlier issue that these maximum values might result in is not considered a problem.

Table 4.5.4: *Descriptive Statistics*

	N	Unit	Mean	Median	S.D.	Min	Max
Premium	224	Percentage	22,61	21,5	36,9	−99,85	150,74
ESG-Score	224	Number	46,26	45,92	17,84	3,24	88,64
Environment	224	Number	42,18	41,91	27,12	0	96,34
Social	224	Number	45,89	45,7	19,79	1,68	91,48
Governance	224	Number	50,33	50,75	22,22	2,42	96,64
Size	223	Number	21,34	21,25	1,41	17,36	25,69
Price-to-Book	219	Number	4,64	2,15	12,9	0,03	177,19
Leverage	224	Number	0,27	0,24	0,23	0	1,64
Revenue Growth	208	Percentage	7,02	4,1	0,25	−93,02	110,31
ROA	222	Percentage	3,81	3,63	9,87	−66,69	47,74
CAPEX/ Total Assets	215	Number	0,04	0,02	0,07	0	0,4
Runup	224	Percentage	3,42	3,08	15,73	−68,69	92,04
Cross-border	224	Dummy	0,13	0	0,34	0	1
Cash	224	Dummy	0,67	1	0,47	0	1
Blockholder	224	Dummy	0,16	0	0,36	0	1
Related	224	Dummy	0,47	0	0,5	0	1

This table presents general descriptive statistics for the premium, target ESG scores and the control variables in the final sample used in the regressions. The number of observations for each variable is reported, as well as the mean, median, standard deviation and minimum and maximum.

5. Method

This section will firstly outline the OLS regression employed to answer and investigate the hypotheses outlined in section 3. Thereafter, the econometric approach employed to perform the regression as well as potential tests and corrections to adjust for econometric issues is outlined.

5.1 The OLS Regressions

This part will primarily account for the different Ordinary-Least-Square (OLS) regressions performed to answer the hypotheses. The methodology to use an OLS regression to sufficiently answer the hypotheses is based on previous research (e.g., Gomes and Marsat, 2019; Jost et al., 2022). The OLS approach provides a clear and straightforward way of performing regressions, but the simplicity may suffer from downsides (accounted for in section 5.2). For hypothesis 1a, the primary objective is to investigate if there exists any clear relationship between only the ESG-score of the target firm and the acquisition premium in an M&A. The tool used to perform the regression consistently through the report is MATLAB. The formal regression for hypothesis 1a is the following:

Hypothesis 1a:

$$Acquisition\ premium_i = \alpha + \beta_1 TESG_{i,t-1} + \beta_2 \psi_{i,t} + \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

(5.1)

In regression 5.1, the $TESG_{i,t-1}$ variable is the ESG-score of the target firm one year prior to the announcement date. The $\psi_{i,t}$ constitutes a vector of control variables the same fiscal year as the deal date. The full description of them is available in section 4.4, and the coefficient for each control variable will be displayed in section 6 along with other findings. To further investigate the subject, hypothesis 1b aims to observe if cross-border deals might affect the relationship between acquisition premium and ESG in any direction. The regression is the following:

Hypothesis 1b:

$$Acquisition\ premium_i = \alpha + \beta_1 TESG_{i,t-1} + \beta_2 (CB_i * TESG_{i,t-1}) + \beta_3 \psi_{i,t}$$
$$+ \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

(5.2)

The interactive term $CB_i * TESG_{i,t-1}$ enables parameter β_2 to capture the enhanced effect of ESG on the premium in cross-border deals. For the second hypothesis, the objective is to observe if the individual pillars of the ESG-score (Environmental, Social, and Governance) might have any effect on the acquisition premium. The regression employed in MATLAB is the following:

Hypothesis 2:

$$Acquisition\ premium_i = \alpha + \beta_1 TEnv_{i,t-1} + \beta_2 TSoc_{i,t-1} + \beta_3 TGov_{i,t-1}$$
$$+ \beta_4(CB_i * TEnv_{i,t-1}) + \beta_5(CB_i * TSoc_{i,t-1}) + \beta_6(CB_i * TGov_{i,t-1}) + \beta_7\Psi_{i,t}$$
$$+ \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

(5.3)

In regression 5.3, the pillars are abbreviated to their first three letters, in which the T naturally stands for the target firm's perspective. The interactive terms β_4- β_6 have the same interpretation as previously accounted for in regression 5.2. Besides this regression that incorporates all pillars of the ESG-score simultaneously, each pillar is regressed against the acquisition premium individually to adjust for potential multicollinearity issues (discussed in section 5.2.3). Thus, these regressions will only contain the individual pillar and the interactive term connected to that specific pillar.

For hypothesis 3, the sample of deals was divided into two subsamples to research if the connection between ESG-score and acquisition premium differs over time. As the sample is not evenly distributed over time, the reasonable approach was to split the sample into two, therefore obtaining two different subsamples of different lengths but with an equal amount of observations. As the primary objective is to observe practically the same thing as in hypotheses one and two, the regressions performed are 5.2 and 5.3 only with a smaller sample of deals.

For hypothesis 4a, the aim is to investigate the acquirer's ESG-score's effect on the acquisition premium. For this sub hypothesis, the regression only observes the acquirer's perspective. The formal OLS is the following:

Hypothesis 4a:

$$Acquisition\,premium_i \; = \; \alpha \; + \beta_1 AESG_{i,t-1} + \beta_2(CB_i * AESG_{i,t-1}) + \beta_3\psi_{i,t}$$
$$+ \; \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

(5.4)

In regression 5.4, $AESG_{i,t-1}$ denotes the acquirer's ESG-score one year prior to the deal announcement day. The interactive term $CB_i * AESG_{i,t-1}$ follows the same definition as previously accounted for in regression 5.2. For hypothesis 4b, the acquirer's ESG-score is incorporated with the target's ESG-score to investigate if that may affect their premium regarding buying targets with low or high ESG-score. The combination of interactive terms and the ESG-score parameters is needed to investigate this hypothesis.

Hypothesis 4b(1):

$$Acquisition\,premium_i \; = \; \alpha \; + \; \beta_1 TESG_{i,t-1} + \beta_2 AESG_{i,t-1} + \beta_3(TESG_{i,t-1} * AESG_{i,t-1})$$
$$+ \; \beta_4\psi_{i,t} + \; \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

(5.5)

Since the ESG-score of both the acquirer and the target now are applied in an interactive term, the interpretation for β_1, β_2, and β_3 changes. The β_1 coefficient measures the effect of the ESG-score of the target on the acquisition premium for an acquirer with an ESG-score of zero. For the β_2 coefficient, the interpretation is similar, i.e., the effect of the ESG-score of the acquirer on the acquisition premium if the target has a hypothetical ESG-score of zero. Furthermore, for the β_3 coefficient, the interpretation is that if it is negative, the effect of the target's ESG-score on the premia will be lower the better the ESG-score of the acquirer. For a positive sign, the interpretation is the opposite.

To further develop hypothesis 4b, every individual pillar is regressed against the acquisition premium to observe the specific effect of each sub-category. In regression 5.6 below, each regression on the pillars is merged, while in the practical setting, they are regressed individually to avoid multicollinearity issues.

Hypothesis 4b(2):

$$Acquisition\ premium_i = \alpha + \beta_1 TEnv_{i,t-1} + \beta_2 TSoc_{i,t-1} + \beta_3 TGov_{i,t-1} + \beta_4 AEnv_{i,t-1}$$

$$+ \beta_5 ASoc_{i,t-1} + \beta_6 AGov_{i,t-1} + \beta_7 (TEnv_{i,t-1} * AEnv_{i,t-1}) + \beta_8 (TSoc_{i,t-1} * ASoc_{i,t-1})$$

$$+ \beta_9 (TGov_{i,t-1} * AGov_{i,t-1}) + \beta_{10} \psi_{i,t} + \lambda_1 Country_{FE} + \lambda_2 Industry_{FE} + \lambda_3 Year_{FE}$$

$$(5.6)$$

The interpretation of the interactive variables is similar to those accounted for previously for regression 5.5. Naturally, the T before each variable stands for the target's perspective, while the A is for the acquirer's perspective. The results from each regression are available in section six of this paper.

5.2 The Econometric Approach

As previously mentioned, despite the OLS method's popularity, the model has some strict assumptions that are required to be fulfilled, which is why the method often suffers downside. Several statistical tests have been performed to deal with the downsides of the linear regression model. This section will account for each test executed to assess the quality of the initial OLS regression.

5.2.1 Breusch-Pagan Test for Heteroscedasticity

One assumption in the Ordinary-Least-Square is that the variance of the error terms are constant over time. Brooks (2019) explains this as the "assumption of homoscedasticity," and if violated, the standard errors of the initial regression will no longer be correct. If the assumption of homoscedasticity is violated, the standard errors are said to be heteroscedastic. To test if the standard errors are heteroscedastic or not, Breusch-Pagan tests have been executed for every hypothesis. The Breusch-Pagan test was introduced in 1979 and was intended to simplify the process of testing for heteroscedasticity by avoiding the approach of the maximum likelihood ratio test (Breusch & Pagan, 1979). The squared residuals are regressed as the dependent variable with the same independent variables as the regression under investigation to conduct the test. The number of observations from the regression is multiplied by the R-square factor to obtain the test stat. The critical value is obtained through a chi-distribution with a 95 percent confidence level. The test statistics obtained from the hypothesis are available in appendix A1. As evident, according to the Breusch-Pagan test, no

regression suffers from heteroscedasticity, and it is to be concluded that the standard errors are consistent.

5.2.2 White's Test for Heteroscedasticity

A White test has been employed to investigate the assumption of homoscedasticity further. In the article by Halbert White (1980), the author presents both a procedure to conduct a sufficient test for heteroscedasticity but also a way of obtaining consistent parameters if the homoscedasticity assumption is violated. The test theorem presented by White (1980) is the following:

$$Whites\ test\ for\ Heteroscedasticity = nD_n(\hat{\beta}_n, \hat{\sigma}_n^2)'\hat{B}_n^{-1} D_n(\hat{\beta}_n, \hat{\sigma}_n^2) \sim \chi^2 k(k+1)/2$$

(5.7)

Brooks (2019) simplifies the procedure of formula 5.7 and explains that the first step is to obtain the squared residuals of the regression. The residuals are then regressed as the dependent variable of an auxiliary regression in which the independent variables are a constant, the original X-variables, the X-variables, and lastly, the cross-products of the X-variables. Like the Breusch-Pagan test, the test statistics are obtained by multiplying the number of observations with the explanation degree R-square. As evident from Appendix A2, none of the regressions rejected H0, implying that the regressions, in fact, are well specified and do not suffer from heteroscedasticity issues. Thus, no corrections for heteroskedasticity have been performed.

5.2.3 Variance Inflation Factor (VIF) Test for Multicollinearity

Multicollinearity means that there exists a high correlation between the independent variables in the regression (Brooks, 2019). The issues that may arise is increased sensitivity to changes in the model specification and considerable standard errors while the R^2 remains high. The test employed in this research paper is the Variance Inflation Factor (VIF). The formula for calculating the VIF is:

$$VIF = \frac{1}{(1-R_i^2)}$$

(5.8)

The VIF measurement observes the potential increase in variance on a particular independent parameter on the basis that the parameter is correlated with some other independent variable (Brooks, 2019). As evident from formula 5.8, the larger the VIF, the higher the multicollinearity issue. Researchers have suggested different rules of thumb for how high the VIF can be without the regression suffering from severe collinearity issues. Both a VIF of five and ten has been suggested. The VIF tests executed on the regressions of this research are available in appendix A3. A prominent finding is that none of the parameters exceeds either five or ten, indicating that the model does not suffer from multicollinearity issues. Based on this finding, no adjustments for multicollinearity have been performed.

5.2.4 Two-Stage Least Squares (2SLS) Approach

Two-stage Least Squares (2SLS) approach has been used to control for potential endogeneity bias resulting from omitted variables. Even though a comprehensive list of control variables has been used, there may still be unobserved variables that explain the dependent variable. For this reason, a 2SLS approach is employed with year-country average ESG score and year-industry average ESG score as instrument variables (IV) for the target ESG variable, in line with previous research (e.g., Jost et al. 2022; Gomes & Marsat, 2018). For IVs to be efficient, the relevance and exclusion conditions need to be satisfied. The relevance condition states that the instrument should be correlated with the suspected endogenous variable. At the same time, the exclusion criterion implies that the IV must not be correlated with the error term (Brooks, 2019). The IVs are likely to correlate with the target ESG score; however, they are unlikely to directly affect the premium paid since it does not capture the specific firm characteristics.

The first stage of the 2SLS involves estimating the initial regression model, however, with the IV estimators as a substitute for the endogenous variable and the endogenous variable as the dependent variable. The IV's coefficients are highly significant in the first stage, indicating that they are relevant instruments. A Hausman test for endogeneity can be performed when the instrument variables are confirmed. The test is performed on the regression, including the fitted values for the endogenous variables obtained from the first stage. If the test result returns significant p-values, the second stage of the 2SLS needs to be employed to correct the endogeneity bias. In this case, however, the test returned high p-values for the coefficient estimates, indicating that the model does not suffer from endogeneity. The test statistics are available in Appendix A4.

5.2.5 Fixed Effects & Robustness Checks

Since the sample characteristics may vary over time and through different entities, all models are estimated with fixed effects parameters for robustness, estimated on the target variables. First, since country-specific factors may affect transaction premiums, a country fixed effects variable has been introduced to encapsulate the variation between countries. Secondly, the deals are anticipated to be affected by industry variation. This regards both firm characteristics and average bid premiums within different industries. Therefore, an industry fixed effects variable has been employed, using the Macro-level industry classification of Refinitiv Eikon. Lastly, a fixed-effects estimator for time effects is utilized to capture the effects of variations in both bid premiums, ESG scores, and firm characteristics over time.

Further robustness checks have also been made to confirm the validity of our results. The models have been re-estimated with observations from the financial crisis and the covid crisis excluded to detect eventual bias in the sample due to skewed variables in these periods of crisis. However, the robustness check was persistent with the initial results and did not change the inference of the models.

6. Empirical Findings & Analysis

Section six will present a general overview of the results obtained from the regressions. Each hypothesis will be treated separately in order to provide a clear view of the findings. Thereafter, an analysis of the findings will be presented, followed by a discussion of the potential shortcomings of the study.

6.1 The ESG-score Effect on Acquisition Premium

For hypothesis one, the primary objective is to investigate if the ESG-score of the target has any significant impact on the acquisition premium. The hypothesis is divided into two sub hypotheses, (a) and (b), in which (a) investigates this relationship formally and (b) examines if cross-border deals have any additional impact regarding the ESG-score and the deal premia. Table 6.1 below presents an overview of the statistics observed from the different regressions. The table will provide the reader with the coefficients, P-values, and significance levels.

As evident from Table 6.1, the results regarding hypothesis 1a and the ESG-score are insignificant. The coefficient of the ESG-score is negative but insignificant, indicating that no direct effect on the acquisition premium in an M&A can be statistically confirmed. For the control variables, only the CAPEX variable is significant. Overall, the adjusted R-square is approximately 0.42, indicating that the explanation level of the independent variables is relatively high. Furthermore, for hypothesis 1b, the results are similar. No statistical significance can be obtained regarding the ESG-score of the target. However, as the primary objective of the hypothesis is to investigate the cross-border effect, the interactive term CB*ESG is the most reasonable variable to focus on. The CB*ESG coefficient is 0.006, indicating that in cross-border deals, for every unit change in the ESG-score of the target firm, the ESG-score's impact on the acquisition premium will increase by 0.6%. This means that in cross-border deals, the ESG-score coefficient is approximately 0.004 (-0.002+0.006). Put differently; for each standard deviation unit increase in ESG, the premium will increase by approximately 7.14% percent in cross-border deals. Although an interesting finding, the CB*ESG coefficient is not statistically significant.

Table 6.1: *Test statistics and P-values from hypothesis 1*

	Hypothesis 1a		Hypothesis 1b	
	Coefficient	*P-Value*	*Coefficient*	*P-Value*
ESG	−0,001	0,424	−0,002	0,230
Size	−0,003	0,904	0,001	0,954
P/B	0,001	0,764	0,001	0,773
Lev	−0,161	0,207	−0,164	0,197
g	0,114	0,288	0,103	0,338
ROA	−0,336	0,164	−0,354	0,141
CAPEX	0,838	0,000***	0,832	0,000***
Runup	−0,355	0,449	−0,367	0,431
CB	0,095	0,157	−0,185	0,348
CASH	0,050	0,361	0,043	0,435
BH	−0,043	0,518	−0,040	0,549
Related	0,030	0,576	0,034	0,525
*(CB*TESG)*			0,006	0,131
FE Country	Yes	Yes	Yes	Yes
FE Industry	Yes	Yes	Yes	Yes
FE Year	Yes	Yes	Yes	Yes
Adj, R^2	0,415		0,421	

* Statistically significant at the 10% level, ** Statistically significant at the 5% level, *** Statistically significant at the 1% level. The table reports the coefficient estimates from regression equation 5.1 and 5.2, where the acquisition premium is the dependent variable. All values are robust and cross checked for endogeneity, heteroscedasticity, and multicollinearity.

6.2 The Pillar Effect on the Acquisition Premium

For the second hypothesis, the primary objective is to observe the individual pillar effect on the acquisition premium. As mentioned previously in this paper, the pillars of the ESG measurement are Environmental, Social, and Governance (ESG). In Table 6.2 below, four different regressions are reported. The row ESG represents a regression in which all three pillars are incorporated into the regression simultaneously. The three other rows (Environmental, Social, and Governance) represent regressions where only the specific variable is apparent. The table reports the coefficients and the P-values below in brackets and will provide an overview of the impact of the different pillars on the acquisition premium.

As one may observe from table 6.2, the differences between the first row (ESG) and the remaining rows are slim, indicating that, as expected, multicollinearity is not an issue in the preliminary regression. The first two columns, ESG and Environmental, show an insignificant negative relationship between the environmental pillar and acquisition premium. The interactive term CB*Environmental measures the environmental pillar's additional effect on the acquisition premium in cross-border deals specifically. The coefficient is 0.003, indicating that the negative relationship between the environmental pillar and the premia changes in cross-border deals to a positive relationship of 0.001. The CB*Environmental coefficient is, however, not significant either. Both the social and the governance pillars have small coefficients that are insignificant. The CB*Social and CB*Governance terms are positive, indicating that cross-border deals seem to enhance the relationship between individual pillars and acquisition premium. However, the coefficients are not significant and should, therefore, be interpreted with caution. As evident from the table, the only significant control variable is once again CAPEX. The adjusted R-Square is approximately 0.42 in all regressions, again similar to the previous hypothesis.

Table 6.2: *Test Statistics and P-values for Hypothesis 2*

| | Hypothesis 2 | | | |
	ESG	Environmental	Social	Governance
TEnv	−0,002	−0,002		
	(0,237)	(0,139)		
TSoc	0,000		−0,001	
	(0,795)		(0,349)	
TGov	0,001			0,000
	(0,565)			(0,829)
(CB*TEnv)	0,002	0,003		
	(0,560)	(0,339)		
(CB*TSoc)	0,003		0,005	
	(0,494)		(0,191)	
(CB*TGov)	0,003			0,004
	(0,471)			(0,374)
Size	−0,002	0,000	−0,004	−0,012
	(0,941)	(0,999)	(0,831)	(0,573)
PB	0,001	0,001	0,001	0,001
	(0,722)	(0,708)	(0,729)	(0,754)
Lev	−0,190	−0,170	−0,178	−0,183
	(0,145)	(0,179)	(0,161)	(0,159)
g	0,083	0,090	0,089	0,118
	(0,460)	(0,415)	(0,415)	(0,276)
ROA	−0,305	−0,301	−0,345	−0,338
	(0,215)	(0,212)	(0,152)	(0,165)
CAPEX	0,780	0,807	0,812	0,806
	(0,000***)	(0,000***)	(0,000***)	(0,000***)
Runup	−0,309	−0,316	−0,320	−0,378
	(0,516)	(0,498)	(0,494)	(0,424)
CB	−0,327	−0,030	−0,136	−0,142
	(0,296)	(0,840)	(0,464)	(0,596)
CASH	0,044	0,054	0,043	0,046
	(0,433)	(0,318)	(0,434)	(0,402)
BH	−0,043	−0,051	−0,036	−0,033
	(0,532)	(0,446)	(0,586)	(0,625)
Related	0,033	0,034	0,030	0,032
	(0,540)	(0,531)	(0,582)	(0,552)
FE Country	Yes	Yes	Yes	Yes
FE Industry	Yes	Yes	Yes	Yes
FE Year	Yes	Yes	Yes	Yes
Adj, R^2	0,410	0,419	0,417	0,413

* Statistically significant at the 10 % level, ** Statistically significant at the 5 % level, *** Statistically significant at the 1 % level. The table reports the coefficient estimates from regression equation 5.3, where the acquisition premium is the dependent variable. All values are robust and cross checked for endogeneity, heteroscedasticity, and multicollinearity.

6.3 The Time Effect of the ESG-score on the Acquisition Premium

In hypothesis 3, the sample of deals is divided into two subsamples, each containing 112 deals. This particular methodology aims to investigate if the valuation of ESG has changed throughout time. The equal division of 224 deals resulted in two time samples, one from 2002-2015 (henceforth subsample 1) and one from 2015-2022 (henceforth subsample 2). In Table 6.3, regressions regarding the total ESG-score and the individual pillars are displayed for each subsample. The results are presented with coefficients and their respective p-values.

From Table 6.3 below, one may observe that in subsample 1, the ESG coefficient is approximately zero with a high, insignificant P-value. The Environmental pillar has a coefficient of approximately zero, thereby not indicating any relationship with the acquisition premium. However, the interactive term CB*Environment does show a significant negative coefficient of -0.007, thereby indicating that in cross-border deals, the relationship between the environmental pillar and the acquisition premium is negative. The Social and Governance pillar does not display any significant relationship. However, the interactive term CB*Governance has a significant positive coefficient of 0.019 at the ten percent level. This indicates that in cross-border deals between 2002-2015, for each unit change in the governance pillar, the impact on the acquisition premium is approximately two percent.

For subsample 2, some interesting empirical results are obtained. The ESG-coefficient is -0.005 at the five percent significance level. All the individual pillars that ESG consists of display negative significant values ranging from -0.002 to -0.004. Therefore, the results indicate that the relationship between the acquisition premium and the ESG-score has changed in later years. The finding implies that enterprises are willing to pay less for targets with high ESG-scores. This relationship holds for every pillar in the ESG-parameter.

Furthermore, the interactive coefficient CB*Environmental has a significant positive coefficient of 0.007, indicating an enhanced relationship between the Environmental pillar and the premia in cross-border deals. However, in subsample 1, there was a negative relationship between cross-border deals and the environmental pillar. The environmental factor might, therefore, be valued higher in later years in cross-border deals than in previous years, while in domestic deals, the value of the pillar is still negative.

Table 6.3: *Test Statistics & P-values for Hypothesis 3*

	Subsample 1,	(2002-2015)			Subsample 2,	(2015-2022)		
	ESG	E	S	G	ESG	E	S	G
ESG	0,001				−0,005			
	(0,824)				(0,023**)			
TEnv		0,000				−0,002		
		(0,843)				(0,097*)		
TSoc			0,002				−0,004	
			(0,292)				(0,039**)	
TGov				0,001				−0,004
				(0,589)				(0,081*)
(CB*TESG)	0,004				0,011			
	(0,397)				(0,107)			
(CB*TEnv)		−0,007				0,007		
		(0,091*)				(0,081*)		
(CB*TSoc)			0,001				0,006	
			(0,822)				(0,349)	
(CB*TGov)				0,019				0,005
				(0,092*)				(0,303)
Size	−0,010	0,006	−0,018	−0,008	−0,030	−0,054	−0,036	−0,038
	(0,764)	(0,846)	(0,566)	(0,784)	(0,374)	(0,101)	(0,275)	(0,253)
P/B	0,000	−0,001	0,000	0,000	0,011	0,014	0,012	0,014
	(0,982)	(0,739)	(0,963)	(0,985)	(0,287)	(0,175)	(0,251)	(0,181)
Lev	−0,319	−0,323	−0,349	−0,284	0,230	0,139	0,205	0,307
	(0,124)	(0,111)	(0,095*)	(0,157)	(0,235)	(0,481)	(0,293)	(0,142)
g	0,219	0,226	0,193	0,241	−0,109	−0,070	−0,127	−0,113
	(0,126)	(0,022**)	(0,119)	(0,083*)	(0,524)	(0,685)	(0,472)	(0,523)
ROA	−0,203	−0,332	−0,203	−0,044	−0,370	−0,339	−0,429	−0,431
	(0,715)	(0,541)	(0,709)	(0,938)	(0,185)	(0,237)	(0,130)	(0,131)
CAPEX	0,860	0,874	0,832	0,837	0,815	0,730	0,906	0,901
	(0,000***)	(0,000***)	(0,000***)	0,000***	(0,006***)	(0,016**)	(0,003***)	(0,003***)
Runup	−0,501	−0,597	−0,467	−0,509	−0,307	−0,043	−0,316	−0,603
	(0,389)	(0,299)	(0,419)	(0,371)	(0,769)	(0,9689)	(0,768)	(0,582)
CB	0,033	0,571	0,176	−0,743	−0,567	−0,311	−0,279	−0,295
	(0,893)	(0,018**)	(0,483)	(0,195)	(0,131)	(0,123)	(0,365)	(0,368)
CASH	0,093	0,106	0,116	0,075	−0,020	0,014	−0,024	−0,015
	(0,239)	(0,172)	(0,150)	(0,331)	(0,799)	(0,868)	(0,769)	(0,854)
BH	−0,061	−0,101	−0,076	−0,053	0,019	0,017	0,029	0,023
	(0,561)	(0,348)	(0,467)	(0,606)	(0,833)	(0,846)	(0,745)	(0,798)
Related	−0,021	−0,061	−0,027	−0,024	0,104	0,114	0,081	0,117
	(0,788)	(0,737)	(0,730)	(0,754)	(0,180)	(0,154)	(0,300)	(0,142)
FE Country	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FE Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj, R^2	0,493	0,511	0,499	0,517	0,427	0,409	0,409	0,395

* Statistically significant at the 10 % level, ** Statistically significant at the 5 % level, *** Statistically significant at the 1 % level. The table reports the coefficient estimates from regression equation 5.2 and 5.3, where the acquisition premium is the dependent variable. All values are robust and cross checked for endogeneity, heteroscedasticity, and multicollinearity.

6.4 The Acquirer's ESG-score Effect on the Acquisition Premium

In the last hypothesis, the acquirer's perspective is taken into consideration. The hypothesis aims to examine the potential relationship between the ESG score of the acquirer and the acquisition premium while also investigating if acquirers with low (high) ESG-score are willing to pay more (less) for targets with high (low) ESG-score. One may explain this hypothesis as the willingness to pay extra capital to acquire companies that may enhance the ESG-score for the acquiring part. To further develop this hypothesis, regressions regarding the pillars of ESG are performed.

As evident from Table 6.4 above, none of the results in the regression are significant. In the AESG column, only the acquirer's perspective is considered. The AESG coefficient is negative at -0.005, indicating a negative relationship between the acquirer's ESG-score and the acquisition premium. The coefficient is not significant. For the CB*AESG term, the coefficient is negative of 0.008 with an insignificant P-value of 0.517; this indicates that for cross-border deals, the relationship between the ESG-score of the target and acquisition premia decreases by 0.8 percent per unit change in the ESG-score.

As mentioned in section 5.1, the interpretation of the variables in the second column differs from before. The TESG variable measures the ESG-score effect of the target if the acquirer has an ESG-score of zero. Notably, from the table, the coefficient of this variable is approximately 0.007; no significance is obtained. The AESG variable has the opposite interpretation, meaning the effect of the ESG-score of the acquirer firm if the target firm has a zero ESG-score. The coefficient of the AESG parameter is negative, indicating that an acquirer with a high ESG-score is willing to pay less for a target with a high ESG-score. The coefficient is, however, insignificant as well. For the interactive term TESG*AESG, the interpretation is that if the sign of the coefficient is positive, the effect of the target ESG-score on the acquisition premium will be more significant the higher the ESG-score of the acquirer. The coefficient from the interactive variable is approximately zero, indicating no direct effect and, thus, no significance. For the environmental pillar, the coefficient is positive for the target but negative for the acquirer. However, the relationship is insignificant. No significance was found for the Social and Governance pillar, suggesting no relationship with the acquisition premium. The interactive variables between the pillars are all insignificant. Thus, no convincing conclusions can be drawn.

Table 6.4: *Test statistics and P-values from Hypothesis 4*

	Hypothesis 4				
	AESG	TESG	E	S	G
TESG		0,007			
		(0,344)			
AESG	−0,005	−0,004			
	(0,238)	(0,578)			
(CB*AESG)	−0,008				
	(0,517)				
(TESG*AESG)		0,000			
		(0,602)			
TEnv			0,009		
			(0,308)		
AEnv			−0,001		
			(0,677)		
(TEnv*AEnv)			0,000		
			(0,351)		
TSoc				0,003	
				(0,562)	
ASoc				−0,003	
				(0,507)	
(TSoc*ASoc)				0,000	
				(0,607)	
TGov					0,003
					(0,597)
AGov					−0,007
					(0,340)
(TGov*AGov)					0,000
					(0,799)
Control Variables	Yes	Yes	Yes	Yes	Yes
FE Country	Yes	Yes	Yes	Yes	Yes
FE Industry	Yes	Yes	Yes	Yes	Yes
FE Year	Yes	Yes	Yes	Yes	Yes
Adj, R^2	0,832	0,851	0,822	0,835	0,829

*Statistically significant at 10% level, **Statistically significant at 5 % level, ***Statistically significant at 1% level. The table reports the coefficient estimates from regression equation 5.4, 5.5, and 5.6 where the acquisition premium is the dependent variable. All values are robust and cross checked for endogeneity, heteroscedasticity, and multicollinearity.

6.5 Empirical Analysis

This section will discuss and analyze the empirical findings accounted for previously. The results will be connected to M&A theory and previous literature to validate the reasonability behind the findings.

For hypothesis 1a, the primary prediction was to obtain a significant positive relationship following the stakeholder view by Freeman (1984). The view was further supported by Aktas, Bodt, and Cousin (2011) as they found evidence of more easily implemented synergies in deals where the target firm has a high ESG-score. However, the results obtained in section 6.1 do not correspond to the previous expectations, as no significance between the acquisition premium and the ESG-parameter was found. The empirical finding is similar to Jost et al. (2022) and Chen and Gavious (2015), but it contradicts Gomes and Marsat (2018). Therefore, this research enhances the view that the ESG-score of the target firm does not have any impact on the premia in an acquisition. For hypothesis 1b, a significant positive relationship was expected following the theory of information asymmetry and its correlation with a low market valuation. However, the finding was that no relationship could be statistically proven. There is a pattern of a positive relationship, and the P-value of 13.1 percent may not be considered statistically significant, but to some degree, it still indicates in which direction the cross-border deals might take. The lack of significance is in line with the findings of Gomes and Marsat (2018) but contrary to the findings of Jost et al. (2022). As only 30 of the deals in the total sample were cross-border, the results should be interpreted with caution.

For hypothesis 2, none of the pillars shows a significant relationship with the acquisition premium in any direction. Cross-border deals seem to consistently enhance the premia and the ESG-score relationship, but the results are not statistically proven here either. The results obtained contradict both the hypothesized view in section 3.2 but also previous research. Gomes and Marsat (2018) found a significant positive relationship between the social pillar and the premia in cross-border deals, while Jost et al. (2022) obtained a negative association between the governance pillar and the premia. The lack of significance is a result in itself, indicating that in the Northern Europe region, the ESG performance has no significant correlation with the acquisition premium in M&As. Although initially surprising, the results were expected since the ESG-score itself did not significantly affect the premia in hypothesis 1a either, which naturally consists of the individual pillars. It might be that ESG has become

a standardized way of conducting business operations; therefore, it might not be valued highly since, to some degree, it is expected. Another explanation is that the market prior to the deal has priced in the ESG-performance, thereby eliminating the additional effect of the premium.

The third hypothesis states that there should be a stronger relationship between the acquisition premium and the ESG-score in later years, contrary to previous years, as the growing concern for sustainable finance in later years should be reflected in a higher premium. However, as evident from section 6.3, there is a significant negative relationship between both the combined ESG score and all pillars and the acquisition premium in subsample 2 (2015-2022). No significant relationship was obtained for subsample 1 (2002-2015). This result indicates that ESG seems to be valued less than in previous years, which is against the hypothesized outcome. To the knowledge of the authors of this paper, no prior research with time subsamples has been conducted, in which the result, therefore, is not comparable. The finding that ESG nowadays is valued negatively supports the shareholder view by Friedman (1970) that the primary objective of an enterprise should be to maximize shareholder wealth, not to invest capital into objectives such as ESG initiatives. Although different research, Hussaini et al. (2021), found evidence supporting the shareholder view. One argument that might explain these findings is that the market in recent years values ESG initiatives higher than enterprises. The higher valuation would then be considered an overvaluation, resulting in ESG-score negatively correlated with the premia. The overvaluation might practically indicate that ESG initiatives simply are too expensive for corporations to purchase. Although not in the scope of this research, one option to investigate this would be to observe, for example, the market-to-book ratio for targets with high ESG-score sometime prior to the deal to observe if the targets have a higher valuation. Another view might be that a high ESG-score may be correlated with overinvestment in ESG. Wang, Lu, and Liu (2021) found a negative connection between targets who overinvest in CSR and the announcement effect, which might explain this result.

Another finding from hypothesis 3 is that in subsample 1, the cross-border effect of the environmental pillar is significantly negative, while in subsample 2, the cross-border effect is significantly positive. This indicates that cross-border deals nowadays enhance the impact of the environmental pillar on the premia, while in previous years, it decreased. In subsample 1, the cross-border effect of the governance pillar is significantly positive. This finding

contradicts Jost et al. (2022) and hypothesis 2c in which a negative relationship was expected to be obtained. One explanation for this might be that the market for corporate control by Manne (1965) is no longer the most persistent theory to explain the governance influence on the premium. Good governance is simply valued higher than bad governance, an intuitively reasonable finding.

Hypothesis 4a states an expected negative relationship between the ESG-score of the acquirer and the acquisition premium. This hypothesis follows the stakeholder theory and is confirmed by Krishnamurti et al. (2019). As evident from section 6.4, no significance was obtained, thereby not confirming the hypothesized finding. For hypothesis 4b, no significance was found either. The expectation was a negative relationship since it is reasonable that acquirers with low ESG-score are willing to pay more for targets with high ESG-score. To the knowledge of the authors of this paper, no previous research regarding this sub hypothesis has been performed. As the results throughout this paper continuously have confirmed the ESG-scores' limited importance in affecting the premia, the finding that acquirers' ESG-rating lacks significance is reasonable as well.

In summary, the findings of this paper do, to a large extent, contradict previous research. However, the results should be interpreted with caution as the study suffers from some limitations, which will be accounted for in section 6.6 below.

6.6 Limitations of the Study

There are some limitations that need to be acknowledged for the interpretation of the findings of this study. These limitations may, to some extent, have affected the outcome of the study and will therefore be addressed to balance the findings further.

As accounted for in section 4.2, there are some issues related to assessing a company's social responsibility and condensing it to a single score. As Dorfleitner and Halbritter (2015) found no convergence in ESG scores from different providers, it should be noted that the sustainability assessment in this study is restricted to the ESG scores provided by Refinitiv. Furthermore, the sample may have some inherent selection bias as the study only considers deals where the target has been assigned an ESG score. Receiving an ESG score from Refinitiv is dependent on the company's decision to report on sustainability-related issues, inducing a risk for self-selection in the sample. This can be controlled with a Heckman test

for selection bias; however, it requires large amounts of additional data on the full population, which is beyond the scope of this thesis.

Since the initial sample was screened to accommodate for the availability of ESG scores for the targets, the sample of acquirers with an ESG score is perceptibly smaller. This resulted in a smaller sample size for hypothesis 4, which may have affected the accuracy of the regression models employed for that particular hypothesis. Furthermore, this study has chosen to include financial targets and acquirers while not excluding minority acquisitions for the sake of the sample size. While some researchers have argued for the exclusion of financial firms in M&A studies due to divergent firm characteristics, this study has chosen to include them, in line with Aktas, Bodt, and Cousin (2011) and Jost et al. (2022). This is considering that the sample size would have been substantially reduced if excluding them, and the reliability of the study would have been affected. Also, the sample is slightly biased towards transactions in the UK due to the scale of the economy. This can be seen from the sample distribution tables; however, the effect has been accounted for via the inclusion of country dummy variables and country fixed effects.

7. Conclusion

The primary purpose of this thesis was to investigate if the premium in mergers and acquisitions is affected by the ESG-score of the target firm. The study was based on 224 deals, limited to the Northern European region between 2002 and 2022, to capture a sufficiently extended time in a relatively homogenous market. To further develop the research, several sub hypotheses were developed, in which the pillars of the ESG-score, the time perspective, and the acquirer's perspective were investigated. The primary methodology employed was OLS regressions, in which several econometric tests were conducted to guarantee the reliability of the results.

The study can conclude that there is no significant relationship between the acquisition premium and the ESG-score of the target firm. The finding indicates that neither the stakeholder- nor the shareholder theory is supported by this result, as enterprises do not seem to value ESG initiatives in any direction. The ESG-score may already be priced in the market valuation of the corporation; thus, the acquisition premium is unaffected by the social responsibility initiatives. However, the empirical findings change when observing two time subsamples, 2002-2015 and 2015-2022. The results indicate that during the period 2015 to 2022, the relationship between the acquisition premium and the ESG-score of the target firm is significantly negative, while in the period 2002 to 2015, it is insignificant. Thus, the ESG-score seems to be valued negatively against the premia in recent years, and particularly, it is valued less than in previous years. This finding supports the shareholder theory. It indicates that the enterprises' objective to invest in matters besides the primary daily operations is valued negatively in later years contrary to previous years. One explanation is that the market might overvalue ESG-initiatives, in theory contributing to a smaller bid premia by acquiring firms. The extensive due diligence process that precedes an M&A decision thereby indicates that the general corporate opinion may be that the market has already priced in the ESG-score into the market valuation or that, in recent years, the market pricing of ESG has been too high.

As the obtained results differ from previous research, the explanation might lay in the geographical limitations of this thesis. Northern Europe is a region considered world-leading in sustainable finance by many. Therefore, the pure general sustainable strength of the corporations in this region might indicate that enterprises with high ESG-score might actually

overinvest in sustainability. With a comparison between relatively homogenous countries, the optimal sustainability score might, therefore, not be the highest possible, which explains the finding of a decreased importance of ESG on the premia in later years. Common microeconomic theory might be the true explanation; if the supply increases, the price will fall. Suppose we are to expect that sustainable actions are valued positively. In that case, the reasonable approach might be to investigate its implications in regions where it is scarce, rather than to look in regions where it is almost common practice.

Future research on this subject needs to be conducted as the findings are ambiguous. An interesting perspective would be to observe if the market valuation prior to the deal is higher for firms with higher ESG-score, ceteris paribus, and based on that, investigate how this might affect the deal premia. Overall, the implications of ESG performance in M&A are still widely debated; more research is necessary to disentangle how ESG is valued by companies undertaking mergers and acquisitions.

References

Akerlof, G. (1970). The Market for Lemons: Uncertainty and the Market Mechanism, *The Quarterly Journal of Economics*, vol. 84, no. 3, pp. 488-500, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 9 April 2022]

Aktas, N., Bodt, E., & Cousin, J.G. (2011). Do Financial Markets Care About SRI? Evidence from Mergers and Acquisitions, *Journal of Banking & Finance,* vol. 35, no. 7, pp. 1753-1761, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 18 April 2022]

Andrade, G., Mitchell, M., & Stafford, E. (2001). New Evidence and Perspectives on Mergers, *Journal of Economic Perspectives*, vol. 15, no. 2, pp. 103-120, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 7 April 2022]

Bergerés, A., Dionne, G., & La Haye, M. (2015). Does Information Asymmetry Affect the Premium in Mergers and Acquisitions? *Canadian Journal of Economics*, vol. 48, no. 3, pp. 819-852, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 13 April 2022]

Breusch, T.S., & Pagan, A.R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation, *Econometrica: Journal of Econometric Society*, vol. 47, no. 5, pp. 1287-1294, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 28 April 2022]

Brooks, C. (2019). Introductory Econometrics for Finance, Cambridge: Cambridge University Press.

Chen, E. & Gavious, I. (2015). Does CSR Have Different Value Implications for Different Shareholders?, *Finance Research Letters,* vol. 14, pp. 29-35, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 25 April 2022]

Cheng, P., Li, L., & Tong, H.S. (2016). Target Information Asymmetry and Acquisition Price, *Journal of Business Finance & Accounting*, vol. 43, no. 7-8, pp. 976-1016, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 11 April 2022]

Deng, X., Kang, J.K., & Low, B.S. (2013). Corporate Social Responsibility and Stakeholder Value Maximization: Evidence from Mergers, *Journal of Financial Economics*, vol. 110, no. 1, pp. 87-109, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 17 April 2022]

Díaz Díaz, B., Sanfilippo Azofra, S., & López Gutiérrez, C. (2013). Synergies or Overpayment in European Corporate M&A, *Journal of Contemporary Issues in Business Research*, vol. 2, no. 5, pp. 135-153, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 12 April 2022]

Dorfleitner, G., & Halbritter, G. (2015). The Wages of Social Responsibility - Where Are They? A Critical Review of ESG investing, *Review of Financial Economics,* vol. 26, pp. 25-35, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 20 April 2022]

Draper, P. & Paudyal, K. (2008). Information Asymmetry and Bidder's Gains, *Journal of Business Finance & Accounting*, vol. 34, no. 3-4, pp. 376-405, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 15 April 2022]

European Commission. (n.d.). Overview of Sustainable Finance, Available Online: https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/overview-sustainable-finance_en [Accessed 16 April 2022]

European Commission. (2020). The European Green Deal Investment Plan and Just Transition Mechanism, Available Online: https://ec.europa.eu/info/publications/200114-european-green-deal-investment-plan_en [Accessed 15 April 2022]

Fama, E., & French, K. (1992). The Cross-Section of Stock Returns, *The Journal of Finance,* vol. 47, no. 2, pp. 427-465, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 26 April 2022]

Freeman, R.E. (1984). Strategic Management: A Stakeholder Approach, Boston: Pitman.

Friedman, M. (1970). The social responsibility of business is to increase its profits, *New York Times Magazine,* pp. 32-33

Glosten, L. & Milgrom, P. (1985). Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders, *Journal of Financial Economics,* vol. 14, no. 1, pp. 71-100, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 11 April 2022]

Gomes, M., & Marsat, S. (2018). Does CSR impact premiums in M&A transactions?, *Finance Research Letters,* Vol. 26, pp. 71-80, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 5 April 2022]

Hussaini, M., Hussain, N., Nguyen, D.K., & Rigoni, U. (2021). Is Corporate Social Responsibility an Agency Problem? An Empirical Note From Takeovers, *Finance Research Letters*, vol. 43, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 28 April 2022]

Jensen, M.C., & Ruback, R.S. (1983). The Market for Corporate Control: The Scientific Evidence, *Journal of Financial Economics*, vol. 11, no. 1-4, pp. 5-50, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 17 April 2022]

Jost, S., Erben, S., Ottenstein, P., & Zülch, H. (2022). Does corporate social responsibility impact mergers & acquisition premia? New international evidence, *Finance Research Letters,* vol. 46, part A, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 12 April 2022]

Kramer, M., & Porter, M. (2006). The Link Between Competitive Advantage and Corporate Social Responsibility, *Harvard Business Review,* vol. 84, no. 12, pp. 78-92, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 28 April 2022]

Krishnamurti, C., Shams, S., Pensiero, D., & Velayutham, E. (2019). Socially Responsible Bidding Firms and Acquisition Decisions: The Australian Evidence, *Pacific-Basin Finance Journal* vol. 57, LUSEM Library website http://www.lusem.lu.se/library [Accessed 19 April 2022]

Krishnan, H., Krishnan, R., & Lefanowicz, C. (2009). Market Perception of Synergies in Related Mergers, *Academy of Strategic Management Journal,* vol. 8, Available Through LUSEM Library Website: http://www.lusem.lu.se/library [Accessed 8 April 2022]

Manne, H.G. (1965). The Market for Corporate Control, *Journal of Political Economy*, vol. 73, no. 2 pp. 110-120, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 7 April 2022]

Mantecon, T. (2009). Mitigating Risk in Cross-border Acquisitions, *Journal of Banking & Finance*, vol. 33, no. 4, pp. 640-651, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 14 April 2022]

Refinitiv. (n.d.). Mergers and Acquisitions from Refinitiv [pdf], Available Online: https://www.refinitiv.com/content/dam/marketing/en_us/documents/fact-sheets/mergers-and-acquisitions-fact-sheet.pdf [Accessed 18 April 2022]

Refinitiv. (2021). Environmental, Social and Governance Scores from Refinitiv [pdf], Available Online: https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/refinitiv-esg-scores-methodology.pdf [Accessed 18 April 2022]

Schwert, G.W. (1996). Markup Pricing in Mergers and Acquisitions, *Journal of Financial Economics,* vol. 41, no. 2, pp. 152-193, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 6 May 2022]

Seth, A. (1990). Value Creation in Acquisitions: A Re-Examination of Performance Issues, *Strategic Management Journal*, vol. 11, no. 2, pp. 99-115, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 8 April 2022]

US SIF Foundation. (2020). US SIF Trends Report 2020 Executive Summary [pdf], Available Online: https://www.ussif.org/files/US%20SIF%20Trends%20Report%202020%20Executive%20Summary.pdf [Accessed 16 April 2022]

Wang, Z., Lu, W., & Liu, M. (2021). Corporate Social Responsibility Overinvestment in Mergers and Acquisitions, *International Review of Financial Analysis,* no. 78, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 3 May 2022]

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity, *Econometrica: Journal of Econometric Society*, vol. 48, no. 4. pp. 817-838, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 4 May 2022]

Yen, T.Y., & André, P. (2019). Market Reaction to the Effect of Corporate Social Responsibility on Mergers and Acquisitions: Evidence on Emerging Markets, *The Quarterly Review of Economics and Finance,* vol. 71, pp. 114-131, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 16 April 2022]

Zhang, C. (2019). The Review of Factors Affecting Merger Premium, *Journal of Service Science & Management*, vol. 12, no. 2, Available through: LUSEM Library website http://www.lusem.lu.se/library [Accessed 15 April 2022]

Appendix

Table A1: *Breusch-Pagan test for Heteroscedasticity*

BP-Test						
Hypothesis	1a	1b	2	3 (Sub.1)	3 (Sub.2)	4
Test-Stat	44,534	46,627	48,538	39,473	27,508	48,361
Critical value	66,334	67,505	72,153	60,481	49,802	64,001
Reject/no reject	Not reject	Not reject	Not reject	Not reject	Not reject	Not reject

This table reports the test statistics for the Breusch-Pagan test for heteroscedasticity in the different models.
A Test-Stat above the critical value indicates heteroscedasticity.

Table A2: *White's test for Heteroscedasticity*

White's						
Hypothesis	1a	1b	2	3 (Sub.1)	3 (Sub.2)	4
Test-Stat	194	194	194	103	91	56
Critical value	225,3288	225,3288	225,3288	125,4584	113,1453	73,3115
Reject/no reject	Not reject	Not reject	Not reject	Not reject	Not reject	Not reject

This table reports the test statistics for White's test for heteroscedasticity in the different models.
A Test-Stat above the critical value indicates heteroscedasticity

Table A3: *Variance Inflation Factor (VIF) Test for Multicollinearity*

VIF-Test

	Hypothesis 1	Hypothesis 2	Hypothesis 3 (2002-2015)	Hypothesis 3 (2015-2022)	Hypothesis 4a	Hypothesis 4b
TESG	2,14		2,174	2,619		2,241
TEnv		1,939	1,989	2,199		2,197
TSoc		2,093	2,324	2,329		2,238
TGov		1,419	1,334	1,809		1,647
AESG					1,979	2,345
AEnv						1,926
ASoc						1,924
AGov						2,174
Size	1,802	1,859	1,592	1,572	2,611	2,188
Lev	1,07	1,072	1,186	1,497	2,25	1,519
P/B	1,206	1,222	1,18	1,087	1,393	2,829
CAPEX	1,165	1,19	1,183	1,247	1,479	1,922
Runup	1,111	1,125	1,298	1,227	1,886	1,923
ROA	1,134	1,181	1,223	1,557	2,004	1,983
g	1,119	1,175	1,22	1,326	1,919	1,379
CASH	1,034	1,053	1,133	1,163	1,429	1,436
CB	1,123	1,16	1,112	1,116	1,613	1,726
BH	1,074	1,086	1,09	1,163	1,384	1,775
Related	1,154	1,18	1,341	1,159	1,746	1,648

This table reports the Variance Inflation Factors (VIF) for the different models. VIF > 10 Indicates high multicollinearity

Table A4: *Hausman Test For Endogeneity*

Hausman

Hypothesis	1a	1b	2a	2b	2c	3 (Sub.1)	3 (Sub.2)	4
T-stat	0,527	0,416	0,684	0,261	-0,108	0,676	-0,466	1,383
P-value	0,599	0,678	0,495	0,795	0,914	0,502	0,643	0,399
Reject/no reject	Not rejected	Not rejected	Not rejected	Not rejected	Not Rejected	Not rejected	Not rejected	Not rejected

* Statistically significant at the 10% level, ** Statistically significant at the 5% level, *** Statistically significant at the 1% level. This table reports the test statistics and the corresponding p-value for the Hausman test for endogeneity in the different models. A p-value below 5% indicates endogeneity

Table A5: Correlation Matrix

	Premium	TESG	Tenv	TSoc	Tgov	AESG	AEnv	Asoc	AGov	SIZE	P/B	Lev	g	ROA	RUNUP	CAPEX	CB	CASH	BH	Related
Premium	1,000																			
TESG	-0,055	1,000																		
Tenv	-0,221	0,752	1,000																	
TSoc	-0,009	0,868	0,623	1,000																
Tgov	0,064	0,700	0,270	0,393	1,000															
AESG	-0,021	0,628	0,546	0,605	0,395	1,000														
AEnv	-0,056	0,558	0,633	0,556	0,214	0,839	1,000													
Asoc	-0,024	0,579	0,494	0,652	0,263	0,932	0,774	1,000												
AGov	0,103	0,425	0,290	0,283	0,566	0,726	0,408	0,513	1,000											
SIZE	-0,219	0,352	0,344	0,298	0,265	0,262	0,231	0,234	0,214	1,000										
P/B	-0,032	0,013	0,034	0,022	-0,045	-0,185	-0,220	-0,101	-0,194	0,029	1,000									
Lev	-0,080	0,061	-0,043	-0,002	0,158	0,046	-0,024	0,036	0,063	-0,235	-0,036	1,000								
g	0,005	-0,060	-0,106	-0,120	0,009	-0,187	-0,197	-0,224	-0,020	0,125	0,008	-0,113	1,000							
ROA	-0,066	-0,038	0,009	-0,080	-0,055	-0,083	-0,125	-0,171	0,081	0,096	0,015	-0,123	0,138	1,000						
RUNUP	0,395	0,148	-0,026	0,116	0,157	0,109	0,061	0,082	0,172	-0,137	0,042	0,091	0,130	0,064	1,000					
CAPEX	-0,018	-0,144	-0,073	-0,145	-0,156	0,046	0,003	0,054	0,022	-0,101	0,078	0,093	0,196	0,078	0,132	1,000				
CB	0,040	0,078	0,088	0,039	0,085	-0,104	0,041	-0,020	-0,212	-0,006	0,003	-0,109	-0,061	0,020	0,037	-0,066	1,000			
CASH	0,190	-0,100	-0,150	-0,132	0,045	0,000	0,059	0,011	-0,099	-0,176	-0,145	0,104	-0,081	-0,061	-0,019	0,023	0,013	1,000		
BH	-0,136	-0,105	-0,095	-0,068	-0,100	0,078	0,232	0,104	-0,096	0,072	-0,001	-0,078	0,117	0,082	-0,113	0,056	0,013	0,029	1,000	
Related	-0,126	0,025	0,135	-0,022	0,025	0,033	0,106	0,012	0,057	0,169	-0,148	-0,213	-0,092	-0,040	-0,074	-0,069	0,016	-0,103	-0,018	1,000