



**UNIVERSITY OF GOTHENBURG**  
**SCHOOL OF BUSINESS, ECONOMICS AND LAW**

**Does ESG performance influence M&A premium?**

*A quantitative study of the ESG impact on M&A premium, using an international sample for deals announced from 2003-to 2021*

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## **Abstract**

This thesis examines the relationship between target firms' ESG performance and M&A premium. This is done through three multivariate regression analyses. The results show that target shareholder wealth during takeovers is positively related to the governance score of the target firm. Looking at the results when the acquirer is public, the findings show that the M&A premium is positively linked to the overall ESG score of the target company, as well as the environmental and social score. Further, we find that target companies benefit from being acquired by companies with higher environmental scores than themselves, as this proves to generate a higher M&A premium. This insight gives support for the shareholder theory.

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Gothenburg, 25th of May 2022

A handwritten signature in black ink, consisting of a large, sweeping initial 'J' followed by a horizontal line extending to the right.

Joel Petersson

A handwritten signature in black ink, consisting of a large, stylized initial 'A' followed by a horizontal line extending to the right.

Alexandra Tjällman

# 1. Introduction

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*This first chapter will introduce the subject of M&A related to ESG and provide an explanation as to why this area of research is important and interesting. This is done in three sections. Section 1.1 provides a brief background to M&A and ESG and their relations to investment decisions. The problem formulation is provided in section 1.2 where an argumentation to why the research area of interest is motivated, as well as the aim of this thesis. Lastly, section 1.3 presents the research questions of this thesis.*

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## 1.1. Background

Mergers and acquisitions (“M&A”) have internationally become one of the fastest ways to grow a business. Looking at the development of the value of M&A transactions in recent years, statistics show a steady increase in the value of M&A transactions worldwide between 2010 and 2021. 2021 showed the largest increase in one year, where the first nine months offered the greatest deal value globally since records began (Sen et al., 2021; Statista, 2022). M&A is frequently discussed together with the terms ESG and sustainability and has been a focus area for researchers and practitioners. Since the publication of the ‘World Commission on Environment and Development report in 1987’ (SOU 2004:104), the debate has been highly ongoing in many different areas, including the financial area. The usage of ESG data has increased in importance in the last period of time. In 2016, there were nearly 9,000 companies that issued sustainability or integrated reports. In comparison, there were fewer than 20 companies in the early 1990s that disclosed their ESG data (Amel-Zadeh & Serafeim, 2018).

ESG data has become more crucial for socially responsible investors in the investment process. The United Nations has developed its Principles of Responsible Investments (“PRI”) for responsible investment. Following the six principles, it is included in principle 1 to “*incorporate ESG issues into investment analysis and decision-making processes*” and principle 3 to “*seek appropriate disclosure on ESG issues by the entities in which we invest.*” (UN PRI, n.d.). The number of signatories that are part of the Principles of Responsible Investments is continuously increasing. In 2006, when the PRI began, there were less than 62 signatories. By 2016, the number of signatories increased to 1501, and by 2021, the number was almost 4000 (UN PRI, n.d.). More companies disclose their ESG data (Amel-Zadeh & Serafeim, 2018). Even though ESG and CSR have been discussed in academia and society for

decades, it has gotten larger attention during the last period of time. The survey by Amel-Zadeh & Serafeim (2018) also revealed that the usage of ESG data is essential for the respondents due to financial reasons rather than ethical reasons. Simultaneously, EY (2022) exposes that ESG is becoming increasingly important when making investment decisions. To maximize the target firm's shareholder value, it may be beneficial to be attractive in the takeover market. Various factors may be of interest to the acquiring firms. Gomes (2019) concluded that target firms with higher CSR scores are more likely to be acquired than similar companies with lower scores. Alongside, Bain & Company (2022) present that decision-makers are prepared to reject investment offers based on the ESG performance.

In investment decisions, such as acquiring another company, information gathering about the target company is crucial to reduce the information asymmetry in the buying process. Investors use ESG scores to make investment decisions that correspond with a sustainable approach. Both Cui et al. (2018) and Cho et al. (2013) show that CSR scores positively reduce information asymmetry, ultimately leading to better-informed investment decisions. One way to integrate CSR activities and knowledge into a corporation could be to acquire companies with high CSR scores (Wickert et al., 2017).

## **1.2. Problem formulation**

There is an ongoing debate on whether investments in ESG are value-creating or value-destroying. The relation between ESG and M&A premium is related to the discussion about what the company should focus on and if ESG activities contribute to shareholder value during takeovers. In this discussion, Friedman (1970) argues that companies should not engage in such activities since it does not create shareholder value. On the other hand, Freeman and Moutchnik (2013) argue that CSR should be integrated into the firm and creates value, not only for shareholders but also for stakeholders. As ESG has increased in importance in investment decisions, it is of great significance for the decision-makers within a company to understand the implications of such investments.

Despite the considerable research on M&A, the ESG performance of the target companies and its effect on value creation has not been that extensively studied. One issue could be the sparse availability of ESG data when it comes to the target in M&A transactions. However, some studies focus on the target's ESG scores. For instance, Gomes and Marsat (2018), as well as Qiao and Wu (2019), concluded that the M&A premium is positively related to the CSR score of the target company. Another study by Jost et al. (2021) analyzed the impact both the target firm's and the acquiring firm's ESG score have on the M&A premium. In their

research, they did not find any significant results. Most of these studies exclude the governance perspective in their sample, leaving an open window for other studies to explore. Due to the modest research within the field and the opposing results, more research ought to be done. In the light of this discussion, Barger et al. (2008) look at the M&A premium when the acquirer holds a public status. They saw that in transactions where the acquirer was public, the target shareholders received 35% more return than in transactions where the acquirer was privately owned.

Further, conclusions can be made that there is a need to complement the existing literature with more studies on the relationship between ESG and the M&A premium. In addition to this, the question of how the differences between the target's and acquirer's ESG scores may affect the M&A premium arises. Hussain and Shams (2022) discover in their paper that a positive difference between the CSR scores of the acquirer and target firms leads to a reduction of the M&A premium<sup>1</sup>. It would be interesting to analyze similar issues in the light of the shareholder theory and the stakeholder theory to gain insights into the collective impact of the target companies' ESG performance and if it is possible to increase value for both shareholders and other stakeholders. These potential insights and information will prove to be relevant to the aim of this thesis.

This study aims to empirically examine what effects the ESG performance of the target firms have on the M&A premium. These effects will be reviewed by observing the relationship between the ESG performance and M&A premium, the impact on M&A premium when the acquirer holds a public status, and the relationship between the ESG gap and M&A premium. By investigating the effect the ESG performance has, this study may give rise to the strategic decision making-process for corporations when it comes to making more informed decisions, such as investments that enhance the ESG performance from the target firm's perspective. In addition, this study aims to contribute to the academic debate by adding new empirical evidence to existing research. Further, this study will include the governance factors, which have not been previously done to a larger extent in related research.

### **1.3. Research questions**

With this background in consideration, the research questions for this report will be the following:

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<sup>1</sup> Hussain & Shams (2022) calculate the CSR gap as acquirer score minus target score. This study will calculate the gap as target score minus acquirer score.

- What effect does the pre-deal ESG performance of the target firm have on the M&A premium?
- What effect does the pre-deal ESG performance of the target firm have on the M&A premium when the acquirer is public?
- What effect does the pre-deal ESG gap between the target firm and the acquiring firm have on the M&A premium?

## 2. Theoretical section

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*To understand the role of the ESG scores of target companies in the context of M&A premium, this section will review related theories and previous studies. This section is divided into seven parts. First, a discussion about M&A, in general, is emphasized (2.1). Second, the stakeholder theory is explored (2.2). Third, the shareholder theory is reviewed (2.3). Fourth, agency problems are described (2.4). Fifth, the previous literature on ESG scores and M&A premium is discussed (2.5). Sixth, previous studies within ESG gaps and M&A premium are stated (2.6). Moreover, the section is finalized with the hypothesis development (2.7).*

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### 2.1. M&A in general

M&A summarizes as a transaction in which the ownership of an entity shifts. There is a target and an acquirer - a seller and a buyer. The transaction is usually noted as either friendly or hostile. An attempted bid that is rejected by the target and made public is considered hostile (Schwert, 2000). Instead, a friendly bid is accepted by both parties - the shareholders of the acquiring company and the target company. A bid can also take place within the same industry and across industries. If the acquirer and the target company are considered to operate in the same industry, the deal is called horizontal (Gomes & Marsat, 2018). At the same time, deals can be made across countries when the acquirer and target are from different nations. A cross-border transaction between two entities may bring both difficulties and possibilities. The emergence of new opportunities to claim further market shares and the opportunities to find synergies are on the positive side. At the same time, committing to a cross-border transaction can be challenging (Rahahleh & Wei, 2013). The integration after the transaction has shown to be hindered by the cultural differences and differences in valuing the foreign assets, together with interpreting foreign laws, regulations, and other transaction costs that are associated with a cross border transaction (Lim et al., 2016; Rahahleh & Wei, 2013).

Regarding the motives for M&A, the primary motive for the acquiring firm would be to utilize synergies. One view is that the most value-creating for the buyer would be to acquire a target to increase knowledge on how to specialize its operations rather than expanding the operations (Bruner, 2005). Other scholars have found that acquirers who announce an acquisition to expand to new areas of business suffer from a decreased return on the day of the announcement (Morck et al., 1990). Other areas that drive the motives for M&A are the

extent of research and development (R&D) the target company is involved in. Laamanen (2007) shows in his paper that targets with high R&D receive a higher premium.

Other motives for a transaction may be related to the behavior of the acquiring company's managers. Jensen (1986) explains agency problems related to the transactions, such as when managers control more cash than they need. The risk that managers then engage with M&A activities that are not value-creating increases. Information asymmetry cannot be neglected when observing the M&A process. Scholars such as Dionne et al. (2015) see that acquirers with an already existing stake of at least 5% (also called blockholders) of the target company have access to more information. This discrepancy in information affects the price of the transaction as the blockholder may use their information to bargain and lower the M&A premium (Walkling & Edmister, 1985). Further, there are multiple possibilities for financing the transaction. The most common ways of paying a bid are through cash payments, stocks, or a mix of both. Research shows that the bid price will variate depending on the chosen payment method (Ayers et al., 2003).

The M&A premium represents the price per share the acquirer pays for the deal compared to the price before the deal was announced (Boone & Mulherin, 2007). There are different ways to measure the M&A premium. Schwert (1996) defines the premium as the sum of the runup and the markup. The runup is the change of the target's stock price a period before the announcement of the bid. The markup is the increase in the target firm's share price stock price after the announcement. Some scholars measure the M&A premium by taking the difference between the final price and the target company's share price 42 days before the announcement (Gomes & Marsat, 2018). Other scholars have a slightly narrow window, examining the effects 4 weeks before the deal announcement (Boone & Mulherin, 2007; Qiao & Wu, 2019; Jost et al., 2021; Hussaini et al., 2021).

The M&A premium is affected by different factors in the transaction. Taking a look at the public status of the acquirer in a transaction may give hints about the M&A premium. Barger et al. (2008) find a relationship between the acquirer holding a public status and a higher M&A premium. Additionally, the scholars discover that the target shareholders receive a higher premium when they have institutional and managerial ownership. As a critique of Barger et al. (2008), Du and Gerety (2018) test in their paper if there is causality between the claims made by Barger et al. (2008). By investigating the deals made by private acquirers who later went public, they could observe the differences in premiums and test if

they were significantly higher than before. Their findings did not show such significance, indicating that the claims made by Barger et al. (2008) did not show any causality.

## **2.2. Stakeholder theory**

A discussion about stakeholder theory and shareholder theory connected to ESG is necessary to understand the differences and why it is essential to observe the data on M&A premium and its connection to ESG performance. The stakeholder theory tells us that an entity such as a company must take ownership of more than just the owners (Donaldson & Preston, 1995). Several groups are affected by the company's actions and operations. It could be the employees, the creditors, or the society, both small and large. The stakeholder is dependent on the organization to reach its core goals (Freeman et al., 2010). Stieb (2009) assesses Freeman's stakeholder theory and seeks to explain it as a definition of two points. The theory defines redistribution of decision-making and benefits to the organization's stakeholders. This includes the environmental impact a company has. Stakeholder theory frequently relates to CSR since the environment is one outer part affecting the firms' operations. Hörisch et al. (2014) conclude that stakeholder theory and sustainability management belong together and that sustainability is one of the critical values which stakeholders need to collaborate around.

In the debate about stakeholder theory and the integration of CSR, Bowie (2012) finds tendencies that the discussion leans towards that CSR is something to be done post profit and not integrated into the firm. Freeman & Moutchnik (2013) agree on this matter and argue that the discussion about CSR should be more about the integration of CSR rather than an addition, and CSR should be a natural inclusion of a firm's way of creating stakeholder value and doing business. When discussing the matter, Freeman states: "*As long as we continue to talk about CSR as separate from 'the business' then we are implicitly approving of the old narrative of business.*" (Freeman & Moutchnik, 2013).

Deng et al. (2013) find evidence for the stakeholder theory by showcasing that firms who engage in activities in the interest of the stakeholders are likely to increase shareholder wealth and corporate value in the long run. Simultaneously, Hill (2020) exemplifies in their book that caring about ESG-related matters affects the shareholders positively since the competence of the company management improves. This improvement would benefit the shareholders through better risk management and improved reputation for the company brand, but also the access to new markets through increased regulatory compliance.

### **2.3. Shareholder theory**

In contrast to the stakeholder theory, the shareholder theory emphasizes that shareholder profit maximization is the only focus an organization should have (Smith, 2003). Milton Friedman named this the *Friedman Doctrine*, and in 1970, he elaborated on his thoughts in *The New York Times*. In the article, he claims that the company's only mission is to make sure the long-term profit is maximized. Friedman (1970) mentions that a business cannot be responsible for social engagements. Instead, it is the people with decision-making power within the company who can be responsible. The view on CSR activities is that CSR is a cost for the shareholders rather than an investment and may affect the company's competitiveness as it leads to increased spending on activities with no return. At the same time, the competitors who will not spend their money on such activities will have a competitive advantage (Friedman, 1970).

This shareholder maximization view would negatively affect the shareholder wealth for firms with high engagement in ESG activities. Although no evidence of a negative impact has been found for M&A premiums and the ESG score of the target company, some evidence has been found on another kind of value creation, which is the abnormal return for the acquiring firm and the ESG score of the acquiring company. For instance, Tampakoudis et al. (2021) found a negative value effect for the acquiring firm's shareholders in the short-term stock performance during M&A deals announced during the Covid-19 pandemic.

### **2.4. Agency problems**

The shareholder theory and its connections to the firms' ESG activities are connected to the agency problems. This is indicated by the dissonance between the firm's managers and the shareholders. The managers are acting in a CSR-enhancing way that corresponds with individual interests and in an attempt for self-redemption (Jiraporn & Chintrakarn, 2013). Furthermore, the connection between agency problems and the M&A premium has been studied by several scholars. For example, Gondhalekar et al. (2004) find in their paper that the main driver for a higher M&A premium is not the potential synergies. Instead, they find evidence that the agency components drive the M&A premium. Bargeron et al. (2008) find that public acquirers pay higher M&A premiums compared to privately owned ones. Building on this evidence, we see that Jensen (1989) supports the claims that publicly traded companies are affected by more agency problems than private companies.

## **2.5. ESG and M&A premium**

This study aims to examine the relationship between the ESG scores of the target company in an M&A transaction and the M&A premium, which represents the shareholder return for the target shareholders. Previous studies examining similar relationships are somewhat limited and have showcased mixed results. A summary of previous studies is available in Table 1. A study by Gomes and Marsat (2018) investigated CSR's impact on the premium. With an international sample between 2003 and 2014, they found that the target's CSR score is positively related to the premium paid. They also conclude that the CSR involvement of the target company is considered to reduce the firm-specific risk and information asymmetry. A study by Qiao and Wu (2019) examined the relationship between the CSR performance of the target firm and the premium in cross-border deals. They had a sample of 252 cross-border deals between 1991 and 2016, and the study showcased a positive relationship. The study also showed that institutional and cultural distance had a slightly negative impact on the premium.

Another study by Jost et al. (2021) examined the influence on the M&A premium of the acquiring firm's ESG score and the target firm's ESG score. They had an international sample of 1,598 from the acquirers' perspective and an international sample of 449 deals from the targets' perspective. In contrast to the findings by Gomes and Marsat (2018) and Qiao and Wu (2019), the study by Jost et al. (2021) did not find that the ESG score of the target or the acquirer impacted the premium. A related study by Hussaini et al. (2021) did not examine the effect of the target firm's ESG score. They investigated the impact of the acquiring firm's ESG score for domestic deals in the US and found a positive relationship between the variables. A summary of the related previous studies and their focus, sample characteristics and findings is presented in Table 1.

Researcher(s)	Focus	Sample characteristics	Findings
Gomes & Marsat (2018)	Whether the CSR performance of the target firm is valued by strategic acquires	588 international deals between 2003 and 2014	Positive relation between targets' CSR performance and the premium
Qiao & Wu (2019)	The impact of the CSR performance of the target has on the premium in cross border deals	252 cross border deals between 1991 and 2016	Positive relation between targets' CSR performance and the premium
Jost et al. (2021)	The impact CSR performance of both acquirer and target have on the premium	1,598 international deals for acquirers, and 449 international deals for targets between 2003 and 2018	Neither acquirer's CSR or target's CSR influence premium alone
Hussaini et al. (2021)	The influence that the acquirer's CSR performance has on the M&A premium	564 US domestic deals between 1994 and 2014	Positive relation between acquirers' CSR performance and the premium

*Table 1: Summary of previous studies for M&A premium and ESG Scores*

## 2.6. ESG gap and M&A premium

Hussain & Shams (2022) studied differences in the pre-deal GAP of the ESG scores and the impact it had on the acquisition performance. In their paper, they found that a positive CSR gap had a negative effect on the takeover premium. They found that by measuring the gap as the acquirer ESG score minus the target ESG score. This holds true for the environmental gap and the social gap separately as well. The authors emphasize that a higher premium is paid when the target has better CSR standards before the deal, as the acquirer is exposed to a higher quality of CSR practices. In contrast, the premium paid tends to be lower when the pre-deal standard of the target company is weaker relative to the acquirer. Deng et al. (2013) look at data for US transactions and the value creation for the target shareholders. They see that the target shareholders receive a higher value when the acquirers have greater CSR engagements in a transaction. The scholars conclude that their findings are consistent with the stakeholder theory.

Furthermore, Wang and Xie (2009) study the relationship between M&A premium and the gap in shareholder protection rights, which is a governance issue, between the target and acquirer. They find that the larger gap between the target firm and the acquirer led to a higher M&A premium. The scholars continue to explain this as a relationship between the shareholder's rights gap and an increased M&A premium. They argue that this value is

distributed between the acquirer and the target firms. Similar objectives were researched by Starks and Wei (2013). On the other hand, they found that when the acquirers come from countries with inferior governance compared to countries with better governance, the M&A premium is higher. The scholars claim the reason for this to be a demand for compensation from the target companies when being exposed to acquirers with inferior governance. Another study by Tampakoudis and Anagnostopoulou (2019) explores how a target with high ESG performance affects the ESG rating of the acquiring firm after an acquisition. They measure the ESG relation as the following: “Target ESG score/Acquirer ESG score.” They find that acquirers benefit from buying firms with higher ESG scores than themselves. The acquirer benefits through an increase in their ESG score, leading to an increase in market value.

## **2.7. Hypothesis development**

Stakeholder theory mentions that CSR needs to be integrated with the business and not treated separately (Freeman & Moutchnik, 2013). Nevertheless, the CSR performance of the target company is found by several scholars to have a positive effect on the M&A premium (Gomes & Marsat, 2018; Qiao & Wu, 2019). One of the aims of this thesis is to provide decision-makers such as company managers with information that will strengthen their decision-making process. By testing if the M&A premium has a positive relation to the ESG scores of the target firm, this may imply how ESG investments may be part of increasing the shareholder value for the target firm. Hypothesis 1 will support the stakeholder view and reinforce that engagement in ESG-enhancing activities may benefit both the shareholders and other stakeholders. Hypotheses 1 is hence composed as follows:

**Hypothesis 1:** The M&A premium is positively related to the ESG score of the target firm.

The second hypothesis adds depth to understanding more than the general relationship between M&A premium and the target company's ESG performance. By looking at this relationship when the acquirer is public, understanding the drivers of M&A premium will improve. In a bidding situation, this would also help the target to understand what kind of acquirer they, and the investment bank hired by them, should focus on. Bargeron et al. (2008) find that the target firm's shareholders receive a higher premium when the acquirer is publicly traded. Tampakoudis and Anagnostopoulou (2019) find that public acquirers have incentives to acquire targets with high ESG performances. The acquirer's motive is to improve their ESG performance and receive positive market reactions that increase their market value.

Since they prove that public acquirers value targets with high ESG performance, it is reasonable for targets to work on improving this. Hypothesis 2 will support the stakeholder theory and test whether target firms receive higher premiums for their ESG performance when the acquirer is public. Hypothesis 2 is stipulated as the following:

**Hypothesis 2:** The M&A premium is positively related to the ESG score of the target firm when the acquirer is public.

The third hypothesis will anticipate the relation between the ESG score of the target firm and the acquiring firm. CSR should be integrated into the firm according to the stakeholder theory (Freeman & Moutchnik, 2013), and engagement in ESG enhancing activities can create shareholder value (Hill, 2020). Tampakoudis and Anagnostopoulou (2019) proclaim that the acquiring firm will benefit when the target firm has higher ESG scores than the acquiring firm. If valued by the acquirer in the bids, this would incentivize the target firm to increase the ESG performance. Hussain and Shams (2022) showcased that when the target firm has a higher score than the acquiring firm, the M&A premium is increased. Wang and Xie (2009) found a positive relationship between the M&A premium and shareholder protection rights gap, which is a part of the "G" in ESG. Based on these findings, it would be value-creating for the target firm's shareholders to engage in ESG enhancing activities to increase their pre-deal ESG performance and thus increase the ESG gap. Further, it would be advantageous for the target firms to actively seek potential acquirers with lower scores than themselves. Hypothesis 3 would support the stakeholder view since a higher gap will generate a higher M&A premium. Hypotheses 3 is stipulated as the following:

**Hypothesis 3:** The M&A premium is positively related to the ESG gap between the target firm and the acquiring firm.

### 3. Data

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*This section will present the data used in the thesis. First, we describe how the data is collected for Model 1 and Model 2 (3.1). Second, we report how data is collected for Model 3 (3.2). Third, we define how we measure the M&A premium (3.3). Fourth, we discuss ESG and how we measure ESG and ESG gaps in this thesis (3.4). Fifth, motivations for the control variables we use for the regression are stated (3.5).*

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#### 3.1. Data collection for Model 1 and Model 2

The data for the study is secondary data collected through the Refinitiv database. The database is owned by the London Stock Exchange Group and provides financial market data worldwide (Refinitiv, n.d.). Scholars have widely used this provider in related research (Gomes & Marsat, 2018; Jost et al., 2021). It has either been used by the name of Refinitiv or by the name of Thomson Reuters, as Refinitiv represents the former financial & business risk data of Thomson Reuters (Thomson Reuters, 2021).

To initiate the data collection, a sample of deals is retrieved from the Refinitiv deal screener through the Excel plugin. The following criteria are applied for the sample:

- (1) The transaction type is mergers and acquisitions
- (2) The target company is public
- (3) The deal value exceeds \$1 million
- (4) The deal is completed
- (5) The bidder owns less than 50 percent of the target company 6 months before the announcement and more than 50 percent of the target company after the transaction
- (6) Deals announced between 1st of January 2003 to 31st of December 2021

The target company needs to be publicly traded due to the access to information. The deal value should exceed \$1 million to exclude smaller deals, following related studies such as Jost et al. (2021). Following Hussaini et al. (2021), the deal should also be completed. The fifth criterion follows the standard procedure in related studies, such as Gomes and Marsat (2018). We have chosen to have a 6-month period before in order to capture a more fair view as the acquiring companies sometimes purchase shares before the final merger or acquisition.

The time frame is motivated as we wanted to include as many samples as possible, and the Refinitiv database reports ESG metrics from 2002 (Refinitiv, 2021).

When screening on the six criterias, an international sample of 20,244 was obtained. When excluding deals where the database does not provide an ISIN as an identifier for the target, a sample of 11,891 deals remained. After obtaining the set of deal data, ESG data was retrieved from Refinitiv Datastream. The following criteria were included:

- (7) There is available ESG data for the target company in Refinitiv Datastream for the following scores, the year before the announcement of the deal:
  - (a) ESG score (TRESGS)
  - (b) Environmental pillar score (ENSCORE)
  - (c) Governance pillar Score (CGSCORE)
  - (d) Social pillar score (SOSCORE)

When merging the ESG data with the deal data, 1,513 deals had a target that provided an ESG score the year before the announcement. Afterward, the financial and accounting data were retrieved from the Refinitiv database and merged with the set. An international sample of 869 deals remained. The descriptive statistics for this data set can be seen in Table 3.

### **3.2. Data collection for Model 3**

The data for Hypothesis 2 is collected from the Refinitiv database. The following criteria are applied for the sample:

- (1) The deal is available in the data set for Hypothesis 1, as the same criteria are applied
- (2) There is available ESG data for the acquiring company in Refinitiv Datastream for the following scores, the year before the announcement of the deal:
  - (a) ESG score (TRESGS)
  - (b) Environmental pillar score (ENSCORE)
  - (c) Governance pillar Score (CGSCORE)
  - (d) Social pillar score (SOSCORE)
- (3) There is available data for total assets of the acquiring firm in the Refinitiv database

Starting the sampling with 869 deals, a number of 465 deals remained after extracting ISIN for the acquiring firms. After excluding deals that did not provide ESG data for the acquiring

firm, a number of 339 deals remained. No samples were excluded after the third criteria. The descriptive statistics for this data set can be seen in Table 9.

### 3.3. Measuring M&A premium

Following related studies, such as Qiao and Wu (2019), Hussaini et al. (2021), and Jost et al. (2021), the M&A premium (PREMIUM4W) is measured by taking the final offer price divided by the target share price four weeks before the announcement, minus 1. This data is retrieved from the Refinitiv database.

$$M\&A\ premium = \frac{Final\ offer\ price}{Target\ share\ price\ 4\ weeks\ before\ announcement} - 1$$

### 3.4. ESG

Environmental, social, and governance are factors included in the sustainability concept. Environmental relates to the footprint an organization has on the climate, such as greenhouse gas emissions, the management of waste, economization of water usage, and the ability to reduce pollution (S&P Global, 2019). This means the direct effect the company's operations have and the effect across the whole supply chain. S&P Global (2019) further states that climate change brings a higher environmental risk.

The social factor focuses on the organization's relation to the people, directly and indirectly, involved with the organization. This relates to human rights, the organization's ability to be safe for the employees, and the integration with the local community. Socially responsible investments traditionally exclude specific industries. These industries are exemplified by Hill (2020) to be involved with alcohol, gambling, guns, and tobacco, to mention a few. Furthermore, in the socially responsible perspective of investing, the focus must not always be on excluding industries. The focus may also be on the good actors improving the social standards around the communities and society.

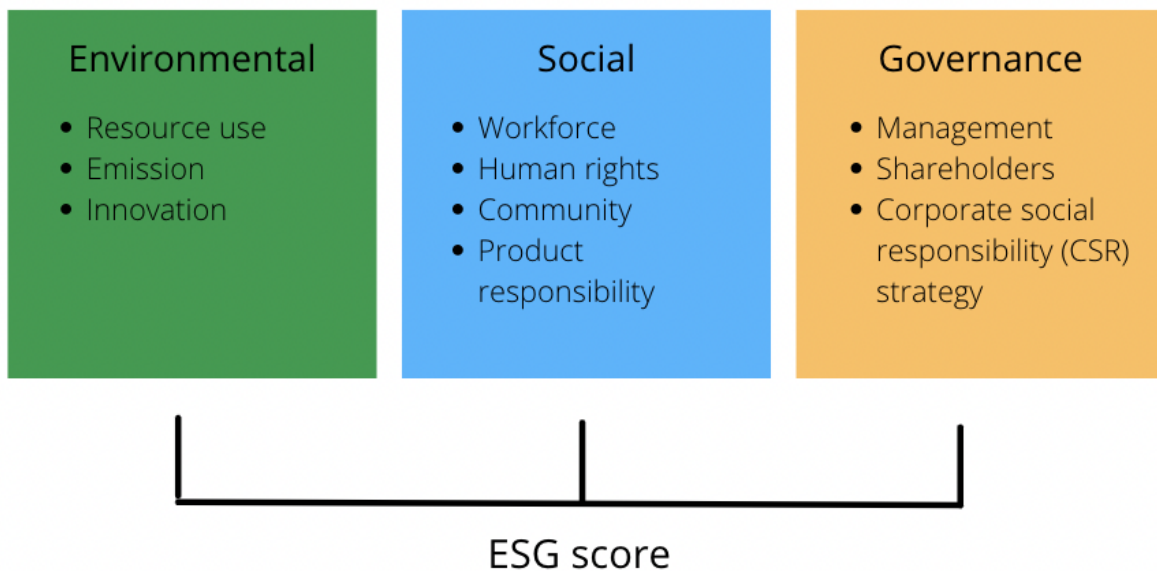
The governance factors are more about the relation between different stakeholders to the organization, working as a tool for incentives and strategy enhancement. The governance score includes the structure and the connection between the management, the board, and the legislative environment, such as shareholder protection. The management structure plays its part in the governance perspective. This includes everything from executive compensation and board compensation, which in some countries is required to be publicly disclosed. It also includes diversity on the board of directors and top management and the compensation for employees to be equal between genders, for example. Further, the separation of ownership

and control is discussed as something affecting governance. The legislative environment may require a separation of the CEO position and the board of directors differently (Hill, 2020; Robeco, n.d.; S&P Global, 2020).

### **3.4.1. Measuring ESG**

Several databases include ESG measures in different ways. Refinitiv provides a relative measure of ESG performance and takes the relevance of the industries and company size into account for all scores except for the governance score. The scores provided by Refinitiv are used as a proxy for the different pillars of ESG. The database is chosen as it is a broad database, covering over 80 percent of the market capitalization globally, and includes over 500 ESG metrics (Refinitiv, 2021). The Refinitiv database includes ESG data from 2002. It has been used extensively by the scientific community and several other scholars in similar studies, such as Gomes and Marsat (2018) and Jost et al. (2021). The ESG scores are based on the company's ESG performance, which may also be verifiable in public domains (Refinitiv, 2021). The ways Refinitiv measures the ESG performance are relevant for this study since this thesis aims to empirically examine the possible effects the ESG performance of the target companies has on M&A premium.

Five different scores measure the ESG performance: ESG score ("ESGscore"), environmental and social score ("ESscore"), environmental score ("Escore"), social score ("Sscore"), governance score ("Gscore"). The scores used in the regressions are the scores published the year before the deal announcement. All scores except ESScore are provided directly from the Refinitiv database. ESScore is a composite score that is calculated as an average of the environmental score (Escore) and the social score (Sscore), aligned with the method of several scholars (Gomes & Marsat, 2018; Jost et al., 2021). The methodology for this thesis is to run regressions for the ESG scores separately to see if they affect the M&A premium separately. The Escore covers emissions, innovation, and resource use. The social score covers areas such as community, human rights, product responsibility, and workforce. The Gscore covers the CSR strategy, management structure, compensation, shareholder's rights, and M&A defenses (Refinitiv, 2021).



*Figure 1: Self-composed figure of the pillars of the ESG score adapted from Refinitiv (2021).*

The collected data is a sample from several countries. It is important to note that data may be reported differently between countries, such as ESG and the control variables. Different countries may, for example, have other practices and rules concerning accounting, which may contribute to the exclusion of deals in countries where there is a lack of the accounting data we have chosen for the control variables. The same applies to the ESG data, where there is a possibility that companies in some countries may report ESG data to a more considerable extent than others and hence have a higher representation in the sample.

### **3.4.2. Measuring ESG gaps**

The ESG gaps will be measured by taking the targets' scores and subtracting the acquirers' scores the year before the deal announcement. A large positive or negative gap indicates a large difference between the scores. This measurement is the opposite of Hussain & Shams (2022) scores, which measure the gap as acquirer score minus target score. We choose the opposite for narrative reasons, as this study intends to pinpoint the value creation for the target company.

The following equations show how the different scores are calculated:

$$ESGgap = ESG \text{ score of the target firm} - ESG \text{ score of the acquiring firm}$$

$$Environmental/social \text{ gap } (ESgap) = ESscore \text{ of the target firm} - ESscore \text{ of the acquiring firm}$$

$$Environmental \text{ gap } (Egap) = Escore \text{ of the target firm} - Escore \text{ of the acquiring firm}$$

$$Social \text{ gap } (Sgap) = Sscore \text{ of the target firm} - Sscore \text{ of the acquiring firm}$$

$$Governance \text{ gap } (Ggap) = Gscore \text{ of the target firm} - Gscore \text{ of the acquiring firm}$$

### **3.5. Control variables**

The control variables for this study are derived from previous research, and they prove to affect the M&A premium. The control variables will enable an analysis where the impact of the control variables are isolated from the possible impact of the ESG performance of the target companies. The control variables are divided into deal-level variables and firm-level variables.

#### **3.5.1. Firm-level variables**

##### **Size and Rsize**

Following Gomes and Marsat (2018), we include a control variable of the size of the target company (“Size”), which is defined as the natural logarithm of the total assets. Previous research, such as Dionne et al. (2015) and Comment and Schwert (1995), identify that size has a significant negative impact on the premium. Comment and Schwert (1995) explain that larger targets tend to have higher integration costs, which in turn ought to lead to lower M&A premiums. In addition, Jost et al. (2021) and Hussaini et al. (2021) use a control variable for relative size instead. The relative size will be included in our robustness check. In line with Hussaini et al. (2021), we define relative size as the ratio between the total assets of the target and the total assets of the acquirer company, the last 12 months (LTM) prior to the deal announcement. LTM is used when no data for 1 year prior to the announcement was found since LTM provides the latest available information prior to the deal announcement (Refinitiv Eikon, 2022). We expect that size has a negative impact on M&A premium.

##### **Market-to-Book Value**

Market-to-Book Value ("MTB") is extracted for the target by taking the target's market value 4 weeks prior to the deal's announcement. We then divide it by the book value of assets, similar to Hussaini et al. (2021) 's study. Comment and Schwert (1995) propose that the market may undervalue firms with low MTB ratios. On the other hand, Dionne et al. (2015) suggest that acquirers are willing to pay more for targets with a high MTB ratio, giving rise to new investment opportunities. We expect MTB to have an effect. However, what effects are ambiguous.

##### **Leverage**

The leverage (“Leverage”) is measured by taking total debt LTM divided by total assets LTM before the deal announcement. Similar measures were done by Gomes and Marsat (2018).

Dionne et al. (2015) emphasize that targets with a substantial amount of debt are less attractive, contributing to a premium decrease. We expect leverage to have a negative impact on M&A premium.

### **Growth**

Following Gomes and Marsat (2018), the control variable growth (“Growth”) is measured by taking the net sales growth over the three years prior to the announcement of the deal. Dionne et al. (2015) express two opposing views. On the one hand, targets with poor sales growth may have higher possible gains, leading to a negative relationship between sales growth and M&A premium. This could be due to an inefficient sales department or synergy gains. On the other hand, targets with poor sales performance may be in a worse negotiation situation, which may give rise to a positive relationship. We expect growth to have an effect. However, what effects are ambiguous.

### **Liquidity**

The liquidity (“Liquidity”) is defined as the ratio of the current assets divided by current liabilities the year before the announcement, in line with Gomes and Marsat (2018). Ayers et al. (2003) identify that liquidity has a positive but not significant impact on the result. This indicates that it could affect the premium, and the liquidity will be included as a control variable. The expected impact is ambiguous.

### **Research and development**

Following Gomes and Marsat (2018) and Hussaini et al. (2021), research and development (“R&D”) are defined by taking the expenditures for research and development divided by total assets the year before the announcement. Laamanen (2007) emphasizes that R&D invest-to-market ratios and the growth rates of R&D have positive impacts on the premium paid. We expected R&D to have a positive effect on the premium paid.

### **Return on equity**

Return on equity (“ROE”) will be calculated as net income the year before the deal announcement, divided by the latest available information about shareholder’s equity prior deal announcement, which is similar to what Gomes and Marsat (2018) and Jost et al. (2021) have done in their study. We expect ROE to have an effect. However, what effects are ambiguous.

### **Capital expenditure**

("Capex") is defined by taking Capital expenditures one year before the deal announcement, divided by total assets the year before the announcement. This is in line with Gomes and Marsat (2018) as well. We expect capital expenditures to have an effect. However, what effects are ambiguous.

### **3.5.2. Deal-level variables**

#### **Cash offer**

For the deals where the bid is paid entirely by cash ("Cash"), a dummy variable of 1 is added. Previous research has shown that cash offers contribute to a higher premium than an offer containing a mix of both cash and stocks or only stocks. This is because cash is often subject to capital gains tax, which is associated with a higher cost for the target shareholders. Therefore, this cost increases the premium (Ayers et al., 2003; Bradley et al., 1988). We expect cash offers to have a positive effect on premiums.

#### **Competition**

If there are several competing bidders on a target, a dummy variable ("Competition") of 1 is added. This data is derived from Refinitiv. Ayers et al. (2003) and Bradley et al. (1988) explain that competition may lead to increased M&A premium. Other research shows that in situations where there are competing acquirers, they tend to become overly determined to win the bid even if the rationals do not suggest a higher bid (Roll, 1986). We expect that competition leads to higher premiums.

#### **Hostile**

A dummy variable called ("Hostile") takes the value 1 if the transaction is considered to be hostile. The data is collected from Refinitiv, which defines hostile as when "*the board officially rejects the offer but the acquiror persists with the takeover*" (Refinitiv Eikon, 2022) and a friendly transaction when the board recommends the offer. Schwert (2000) explains that hostility can be a strategy from the target side to increase the bid. This has been shown in previous studies, where transactions labeled hostile have given larger M&A premiums (Dionne et al., 2015). We expect that a hostile bid leads to a higher premium.

#### **Blockholder**

If the acquirer possesses more than 5% of the target company before the deal's announcement, a dummy variable of 1 called ("Blockholder") is added. The blockholder is relevant since it discloses if potential information asymmetry affects the premium due to the

bidder's advantage in the negotiation. Dionne et al. (2015) tell us that there is a difference between the premium when the acquirers have at least a 5% ownership stake before the announcement than if the acquirer would not have such ownership. This is because buyers already involved with the target company have more information about them. Naturally, this provides a higher bargaining power (Walkling & Edmister, 1985). We expect that blockholder will decrease premiums.

### **Crossborder**

This dummy variable will be called (“Crossborder”) and will take a value of 1 if the acquiring firm and the target firm are from different countries. This dummy is included as Gomes and Marsat (2018) concluded that the acquiring firms only valued the social dimension of ESG for cross-border transactions. Lim et al. (2016) show that a cross-border deal can open up more synergies. Gomes and Marsat (2018) mention that the deals made across the borders will naturally bring more information asymmetry and an increased risk of not being able to evaluate the potential synergies in a fair. We expect cross-border deals to have an effect. However, what effects are ambiguous.

### **Horizontal**

If the acquirer and the target have been noted to be in the same macro industry, a dummy variable of 1 is added called (“Horizontal”). Gomes and Marsat (2018) include this in their study and claim that depending on if the deal is made between the same or across different industries, the potential synergies and bargaining power may affect the premium. M&A premium seems to be higher due to these effects when the target and acquirer have operations within the same industry. We expect horizontal M&As to have a positive effect on the premium.

### **Acquirer public status**

Scholars such as Barger et al. (2008) find in their paper that when an acquirer is public, the shareholders for the target companies earn 35% more than when compared to privately owned acquirers. Given their findings, we choose to control for this factor and expect the acquirer’s public status to have a positive effect on M&A premium. A dummy variable of 1 called (“Acqpubl”) will be added if the acquirer is a publicly-traded company.

### **Year, industry, and country**

Apart from the variables stated above, we will also control for the target company's year, industry, and country effects to control for unobserved heterogeneity. The industry will be

based on the target macro industry provided by the database Refinitiv. As we have an international sample, some parts of the world will have a higher weight in this study.

### 3.5.3. Summary description of the variables

#### Variables' definitions

Variable	Description
<b>Premium4w</b>	The ratio between the final offer price and the target share price 4 weeks before the announcement, minus 1
<b>Premium1w</b>	The ratio between the final offer price and the target share price 1 week before the announcement, minus 1
<b>Premium1d</b>	The ratio between the final offer price and the target share price 1 day before the announcement, minus 1
<b>ESGscore</b>	The ESG score as provided by the Refinitiv database (TRESGS)
<b>ESscore</b>	The average between the EScore and the Sscore.
<b>EScore</b>	The environmental score as provided by the Refinitiv database (ENSCORE)
<b>Sscore</b>	The social score as provided by the Refinitiv database (SOSCORE)
<b>Gscore</b>	The governance score as provided by the Refinitiv database (CGSCORE)
<b>ESGscore x Acqpubl</b>	Interaction term equalling the ESGscore if the acquirer is public, and 0 otherwise
<b>ESscore x Acqpubl</b>	Interaction term equalling the ESscore if the acquirer is public, and 0 otherwise
<b>EScore x Acqpubl</b>	Interaction term equalling the EScore if the acquirer is public, and 0 otherwise
<b>Sscore x Acqpubl</b>	Interaction term equalling the Sscore if the acquirer is public, and 0 otherwise
<b>Gscore x Acqpubl</b>	Interaction term equalling the Gscore if the acquirer is public, and 0 otherwise
<b>ESGgap</b>	ESGscore of the target company subtracted with the ESGscore of the acquiring company
<b>ESgap</b>	ESscore of the target company subtracted with the ESscore of the acquiring company
<b>Egap</b>	EScore of the target company subtracted with the EScore of the acquiring company
<b>Sgap</b>	Sscore of the target company subtracted with the Sscore of the acquiring company
<b>Ggap</b>	Gscore of the target company subtracted with the Gscore of the acquiring company
<b>Size</b>	Natural logarithm of total assets
<b>Rsize</b>	The ratio between the total assets of the target and the total assets of the acquirer LTM
<b>MTB</b>	The ratio between the target market capitalization and book value of the assets LTM
<b>Leverage</b>	The ratio between total debt and total assets LTM
<b>Growth</b>	The net sales growth rate the tree years prior to the deal announcement
<b>Liquidity</b>	The current ratio, which equals the ratio between current assets and current liabilities
<b>R&amp;D</b>	The ratio of the R&D to and the total assets LTM
<b>ROE</b>	The ratio of the net income and the shareholder's equity
<b>Capex</b>	The ratio of capital expenditures and total assets
<b>Cash</b>	Dummy variable equalling 1 if the deal is fully paid with cash
<b>Competition</b>	Dummy variable equalling 1 if there are several bidders

<b>Hostile</b>	Dummy variable equalling 1 if the deal is considered to be hostile
<b>Blockholder</b>	Dummy variable equalling 1 if the acquiring firm possesses more than 5% of the target company 6 months before the deal announcement
<b>Crossborder</b>	Dummy variable equalling 1 if the acquiring firm and the target firm are based in different countries
<b>Horizontal</b>	Dummy variable equalling 1 if the acquiring firm and the target firm are in the same industry
<b>Acqpubl</b>	Dummy variable equalling 1 if the acquiring firm is public

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*If not stated otherwise, all variables are for the target company and the year before the deal announcement.*

*Table 2: Summary description of the control variables for the multivariate regression*

Boxplots of the continuous variables are shown in Appendix 4. All continuous variables have outliers and are hence winsorized on the top and bottom 1% of the observations to reduce the effect possible outliers may have on the analysis. However, the ESG variables are not winsorized as they can only take values between 0 and 100, and no severe outliers have been spotted. The effect of the winsorizing is displayed in Appendix 4.

## 4. Methodology

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*The methodology of the thesis is described in this section. First, we describe the research strategy used (4.1). Second, we present the research design and the analyses (4.2). Third, the assumptions for linear regressions are emphasized (4.3).*

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### 4.1. Research strategy

With regards to the aim of the thesis and the hypothesis stated, a quantitative research strategy is considered the most suitable approach. The cross-sectional data used is characterized by measurement of the deals and statistical analysis methods, which makes the quantitative research appropriate (Patel & Davidson, 2019).

With a positivist approach, this thesis will seek to find logical and statistical relations between different ESG data and M&A premiums and relate the statistically significant outcome to the shareholder/stakeholder theories. Since this thesis relates to previous studies and existing theories and explores hypotheses, the research approach aligns with a deductive approach. This approach differs from the inductive approach, which focuses on developing new theories (Bell et al., 2022).

### 4.2. Research design

The study aims to examine the relation between two variables per model. Following related studies, multivariate regressions are performed as the research design with M&A premium (“Premium4w”) as the dependent variable (Gomes & Marsat, 2018; Hussaini et al., 2021; Jost et al., 2021). The multivariate regression analysis is suitable, as we assume several variables to impact the M&A premium. All models will use the same control variables, as all regressions have M&A premium as the dependent variable.

The research design will test whether there is a linear relationship between the variables. This may be considered a limitation of the research design, as possible non-linear relations will not be considered. Although, univariate analyses will be performed for each hypothesis's data to capture possible differences between deals with high scores and low scores within the different categories.

#### 4.2.1. Univariate analyses

The study will initiate with univariate analyses. The different ESG scores are divided into two different groups per score. The following groups are considered:

*Model 1 = Group 1: ESG scores below median*

*Group 2: ESG scores above median*

*Model 2.1 = Group 1: Private acquirers*

*Group 2: Public acquirers*

*Model 2.2 = Group 1: ESG interaction scores below median*

*Group 2: ESG interaction scores above median*

*Model 3 = Group 1: ESG gaps below median*

*Group 2: ESG gaps above median*

The univariate analyses will showcase whether there is a difference in the M&A premium for the different groups within each model. The univariate analysis will not consider the control variables, as it only examines the M&A premium for the different groups.

#### 4.2.2. Multivariate regression analyses

Model 1 will examine what effect the pre-deal ESG performance of the target firms have on the M&A premium. Model 1 is the multivariate regression equations used in the analyses for Hypothesis 1:

$\beta_0$  = the intercept

$X_1$  = The ESG score of interest (ESGscore, ESScore, Escore, Sscore, Gscore)

$\beta_i$  = the slope of the independent variables

$\varepsilon_i$  = the error term

*Model 1:*

$$\begin{aligned} \text{PREMIUM4}W_i &= \beta_0 + \beta_1 X_i + \beta_2 \text{SIZE}_i + \beta_3 \text{MTB}_i + \beta_4 \text{LEVERAGE}_i + \beta_5 \text{GROWTH}_i \\ &+ \beta_6 \text{LIQ}_i + \beta_7 \text{R\&D}_i + \beta_8 \text{ROE}_i + \beta_9 \text{CAPEX}_i + \beta_{10} \text{CASH}_i + \beta_{11} \text{COMPETITION}_i \\ &+ \beta_{12} \text{HOSTILE}_i + \beta_{13} \text{BLOCKHOLD}_i + \beta_{14} \text{CROSSBORDER}_i + \beta_{15} \text{HORIZONTAL}_i \\ &+ \beta_{16} \text{ACQPUBL}_i + \text{Year Effects} + \text{Industry Effects} + \text{Country Effects} + \varepsilon_i \end{aligned}$$

Model 2 will instead use an interaction term of the variables “Acqpubl” and the different ESG scores as the independent variables of interest to interpret the impact on the M&A premium. The regression will not include “Acqpubl” as a control variable. The interaction terms are calculated as:

$$\text{Public acquirer} = 1 \times \text{ESG score of interest}$$

$$\text{Private acquirer} = 0 \times \text{ESG score of interest}$$

Model 2 is the multivariate regression equation that will be used in the analysis for Hypothesis 2 where:

$\beta_0$  = the intercept

$X_1$  = The ESG score of interest (ESG score x Acqpubl, ESscore x Acqpubl, Escore x Acqpubl, Sscore x Acqpubl, Gscore x Acqpubl)

$\beta_i$  = the slope of the independent variables

$\varepsilon_i$  = the error term

*Model 2:*

$$\begin{aligned} \text{PREMIUM4W}_i = & \beta_0 + \beta_1 X_i + \beta_2 \text{SIZE}_i + \beta_3 \text{MTB}_i + \beta_4 \text{LEVERAGE}_i + \beta_5 \text{GROWTH}_i \\ & + \beta_6 \text{LIQ}_i + \beta_7 \text{R\&D}_i + \beta_8 \text{ROE}_i + \beta_9 \text{CAPEX}_i + \beta_{10} \text{CASH}_i + \beta_{11} \text{COMPETITION}_i \\ & + \beta_{12} \text{HOSTILE}_i + \beta_{13} \text{BLOCKHOLD}_i + \beta_{14} \text{CROSSBORDER}_i + \beta_{15} \text{HORIZONTAL}_i \\ & + \text{Year Effects} + \text{Industry Effects} + \text{Country Effects} + \varepsilon_i \end{aligned}$$

Model 3 will examine what effect the pre-deal ESG gap between the target firm and acquiring firm has on the M&A premium. Model 3 is a multivariate regression equation used in the analysis for Hypothesis 3 where:

$\beta_0$  = the intercept

$X_1$  = The ESG gap of interest (ESGgap, ESgap, Egap, Sgap, Ggap)

$\beta_i$  = the slope of the independent variables

$\varepsilon_i$  = the error term

*Model 3:*

$$\begin{aligned} \text{PREMIUM4W}_i = & \beta_0 + \beta_1 X_i + \beta_2 \text{SIZE}_i + \beta_3 \text{MTB}_i + \beta_4 \text{LEVERAGE}_i + \beta_5 \text{GROWTH}_i \\ & + \beta_6 \text{LIQ}_i + \beta_7 \text{R\&D}_i + \beta_8 \text{ROE}_i + \beta_9 \text{CAPEX}_i + \beta_{10} \text{CASH}_i + \beta_{11} \text{COMPETITION}_i \end{aligned}$$

$$\begin{aligned}
& + \beta_{12}HOSTILE_i + \beta_{13}BLOCKHOLD_i + \beta_{14}CROSSBORDER_i + \beta_{15}HORIZONTAL_i \\
& + \beta_{16}ACQPUBL_i + Year\ Effects + Industry\ Effects + Country\ Effects + \varepsilon_i
\end{aligned}$$

### 4.2.3. Robustness test and propensity score matching

Robustness tests will be conducted for all three models. Firstly, alternative measures of the M&A premium will be examined, aligned with the method of several scholars (Hussaini et al., 2021; Jost et al., 2022). Two different alternative dependent variables will be used: the 1 day-premium and the 1 week-premium. We will make an additional robustness test with a change of the control variable Size. The same dependent variable as in the main models, the 4 week-premium, will be used. However, the relative size variable between the target firm and the acquiring firm will be used instead of the target size. The reason for including this robustness check is because related studies use either target size or relative size as the size control variable. Therefore, we want to report the results for both.

Endogeneity issues may occur if the independent variable of interest (ESGscore, ESScore, EScore, Sscore, Gscore, ESG score x Acqpubl, ESScore x Acqpubl, EScore x Acqpubl, Sscore x Acqpubl, Gscore x Acqpubl, ESGgap, ESGap, Egap, Sgap, and Ggap) is correlated with the error term (Brooks, 2008). Propensity score matching will be conducted to ensure the study from a possible endogenous selection of our ESG scores/gaps, in line with several related studies (Gomes, 2019; Hussaini et al., 2021; Hussain & Shams, 2022). We will estimate the Average Treatment Effect on the Treated groups (ATET) from the sample. We will consider the following as the treated group and the control group:

*Model 1: Treated group = ESG scores above median*

*Control group = ESG scores below median*

*Model 2: Treated group = ESG scores above median*

*Control group = ESG scores below median*

*Model 3: Treated group = ESG gaps above median*

*Control group = ESG gaps below median*

After sorting the ESG scores and ESG gaps into treated and control groups, we perform logit treatment models to extract the ATET. The independent treatment variables are the firm characteristics variables Size, MTB, Leverage, R&D, ROE, and Capex.

#### 4.2.4. Assumptions for linear regressions

Since linear regressions are used in this thesis, there are certain conditions that need to be met for linear models to be appropriate (Brooks, 2008). The conditions are the following:

- (1) Linear relationship
- (2) Multivariate normality
- (3) No/little multicollinearity
- (4) No auto-correlation
- (5) Homoscedasticity

To test for linear relationships (1), the Ramsey RESET test will be used. To test multivariate normality (2), Shapiro–Wilk W tests for normal data are performed. To test for no or little multicollinearity (3), Variance Inflation Factors ("VIF") are used. Autocorrelation may occur in cross-sectional data (Weeks, 2008). Although, the assumption for autocorrelation (4) is not considered to be relevant for this thesis due to the nature of the data. Assumption (5) for homoscedasticity is tested by performing a Breusch-Pagan test.

The results from the test for conditions (1), (2), and (5) are shown in Appendix 3. The results from (3) are shown in each regression table in the column 'Maximum VIF'. The Pearson correlation matrix is conducted in the bivariate correlations to detect a possible correlation between variables. Test (1) results reveal potential issues with omitted variables for Model 2 when analyzing the interaction term for the Gscore as the  $p\text{-value} < 0.1$ . Further, there might be issues for Model 3 when analyzing the Gscore as the  $p\text{-value} < 0.1^2$ . Test (2) results reveal that there might be issues with multivariate normality for certain variables. For Model 3, we see high probabilities for the variables Ggap and Size. We view the data as acceptable, although not perfectly normal, when plotting the normal quantile. Additionally, we have a relatively large sample size which makes the normality assumptions less of a concern. The results from test (3) showcase that none of the main variables exceeds a VIF value of 10, which is the generally accepted limit in academia. The results from the test (5) reveal that the data likely have issues of heteroscedasticity. This issue is solved by using robust standard errors in the models (Brooks, 2008; White, 1980).

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<sup>2</sup> As Model 2 and Model 3 for Gscore potentially suffer from omitted variables, no conclusions will be drawn for the Gscore for these models. The results from the Ramsey RESET test will hence not affect how we predict our final results of this thesis.

## 5. Results and analysis

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*This section will present and analyze the results of our regressions. First, the results and analysis for Model 1 are presented (5.1). Second, the results and analysis for Model 2 are shown (5.2). Third, the results and analysis for Model 3 are displayed (5.3). Fourth, the robustness tests and propensity score matching are introduced (5.4). Fifth, the limitations of the method used are analyzed.*

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### 5.1. Model 1 - ESG performance and the M&A premium

#### 5.1.1. Descriptive statistics

The descriptive statistics for Model 1 and Model 2 are shown in Table 3. On average, the M&A premium is 0.31, which is a 4-week M&A premium of 31%. The lowest premium is -66%, and the highest is 156%. There is hence a large spread between the returns. The standard deviation is 33%, although the median is close to the mean, and the premium is hence not considered skewed. The same proximity applies to the ESG score, the Sscore, and the Gscore. For the ESScore and the Escore, the average score is somewhat higher than the median, although not substantially high. The Gscore that will showcase significant results in the multivariate regression analysis has an average score of 41.97, with a minimum score of 0.38 and a maximum score of 98.37.

Considering the deal-specific variables, 54% of the deals are fully paid with cash. We see that only 1% of the deals are considered hostile, and 11% of the deals consist of processes with several bidders. 16% of the deals have acquirers that possessed more than 5% of the target company 6 months before the deal announcement. Most of the deals are domestic, as only 34% of the deals have the acquiring firm and target firm based in different countries. 59% of the deals are with parties in the same industry, and 58% of the deals have public acquirers.

Variable	N	Mean	p25	p50	p75	SD	Min	Max
Premium4w	869	0.31	0.13	0.28	0.46	0.33	-0.66	1.56
ESG	869	35.99	22.33	32.99	48.83	17.87	1.87	87.09
ESG x Acqpubl	869	20.74	0.00	17.92	35.49	22.25	0.00	86.69
ESscore	869	31.86	15.67	25.98	46.02	21.05	0.44	92.32
ESscore x Acqpubl	869	18.18	0.00	10.72	28.24	22.19	0.00	90.43
Escore	869	25.44	0.19	18.12	41.80	26.18	0.00	97.86
Escore x Acqpubl	869	14.57	0.00	0.00	21.14	23.46	0.00	95.05
Sscore	869	38.29	23.60	35.58	50.87	20.23	0.66	95.80
Sscore x Acqpubl	869	21.78	0.00	17.20	37.86	23.94	0.00	95.10
Gscore	869	41.97	23.58	42.39	59.51	21.84	0.38	98.37
Gscore x Acqpubl	869	24.80	0.00	16.24	47.52	26.69	0.00	98.37
Size	869	7.93	6.96	7.91	8.86	1.56	4.08	12.10
Leverage	869	0.28	0.10	0.25	0.41	0.23	0.00	1.20
Growth	869	11.31	-1.95	4.48	14.12	35.10	-47.05	246.27
Liquidity	869	1.83	0.69	1.31	2.10	2.40	0.00	17.60
R&D	869	0.02	0.00	0.00	0.01	0.05	0.00	0.26
ROE	869	0.07	0.00	0.08	0.16	0.47	-1.84	2.62
Capex	869	0.05	0.01	0.03	0.06	0.06	0.00	0.33
Cash	869	0.54	0.00	1.00	1.00	0.50	0.00	1.00
Competition	869	0.11	0.00	0.00	0.00	0.31	0.00	1.00
Hostile	869	0.01	0.00	0.00	0.00	0.10	0.00	1.00
Blockholder	869	0.16	0.00	0.00	0.00	0.37	0.00	1.00
Crossborder	869	0.34	0.00	0.00	1.00	0.47	0.00	1.00
Horizontal	869	0.59	0.00	1.00	1.00	0.49	0.00	1.00
Acqpubl	869	0.58	0.00	1.00	1.00	0.49	0.00	1.00

Table 3: Descriptive statistics for Model 1 and Model 2

### 5.1.2. Bivariate correlation

When running the regression, a problem with multicollinearity may appear. The matrix in Table 4 shows the correlation between the variables and may indicate why separating some variables from each other into different regressions will be wise. Table 4 shows a pairwise correlation between the ESG scores used in Model 1. As expected, the different ESG scores receive a high correlation with the overall ESGscore and each other separately. Naturally, this is due to the inclusion of the separate scores in the overall ESG scores. This provides enough information for the study to conclude the necessity of dividing the different ESG scores into separate regressions. The arguments for separating the independent scores will hold for Model 2 and Model 3 as well.

Looking at Escore and Sscore, we note the correlation of 64%. This study will include the composite score ESscore, which is the average of the Escore and the Sscore since it has been carried out by previous studies (Gomes & Marsat, 2018; Jost et al., 2021). On the other hand, we add separate regressions built on each independent score. For a complete Pearson correlation matrix between all variables, see Appendix 1. No substantially high correlation has been found between the independent variables.

	<b>ESG</b>	<b>ESscore</b>	<b>Escore</b>	<b>Sscore</b>	<b>Gscore</b>
<b>ESG</b>	1.000				
<b>ESscore</b>	0.910***	1.000			
<b>Escore</b>	0.801***	0.929***	1.000		
<b>Sscore</b>	0.859***	0.879***	0.640***	1.000	
<b>Gscore</b>	0.676***	0.365***	0.323***	0.341***	1.000

\* p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 4: Correlation matrix between the ESG scores

### 5.1.3. Univariate analysis

Table 5 showcases the results from the univariate analysis for Model 1. Due to the uneven number of observations, there is one more in the second group. The results showcase no significant difference in the M&A premium between the deals with scores above the median and the deals with scores below the median for the ESGscore, ESscore, Escore, and Sscore. Although, for the Gscore, the output shows on a 10% significance level that the M&A premium differs between the targets with Gscores above the median and below the median.

	<b>Group</b>	<b>Obs</b>	<b>Mean</b>	<b>Test of difference</b>
<b>ESGscore</b>	< Median	434	0.30	0.45
<b>ESGscore</b>	> Median	435	0.32	0.45
<b>ESscore</b>	< Median	434	0.30	0.60
<b>ESscore</b>	> Median	435	0.32	0.60
<b>Escore</b>	< Median	434	0.32	0.23
<b>Escore</b>	> Median	435	0.30	0.23
<b>Sscore</b>	< Median	434	0.31	0.93
<b>Sscore</b>	> Median	435	0.31	0.93
<b>Gscore</b>	< Median	434	0.29	0.09*
<b>Gscore</b>	> Median	435	0.33	0.09*

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 5: Univariate analysis for the data for Model 1

#### 5.1.4. Multivariate regression analysis

Model 1 is shown in Table 6 and includes five regressions with the different components of ESG (described in section 3.4.1) as the independent variables of interest and Premium4w as the dependent variable. The models are controlled for year, industry, and country effects. All coefficients are positive for all ESG-related independent variables. However, Gscore is the only ESG variable with significant output, at a 10% significance level. This indicates that Gscore has a positive impact on the M&A premium. One standard deviation increase in the Gscore regression coefficient increases the M&A premium by 1.97<sup>3</sup> percentage points.

For the control variables, size, MTB, and blockholder are significant with negative coefficients. These results are well in line with what previous studies have shown, that both size and blockholder have negative effects on M&A premium (Comment & Schwert, 1995; Dionne et al., 2015; Walkling & Edmister, 1985). MTB has a negative effect on the M&A premium. This is more in line with Comment and Schwert (1995), who discuss that markets' tendencies are prone to undervalue firms with low MTB ratios. Simultaneously, significant effects with positive coefficients are found for cash and competition. These findings align with what previous scholars have found (Ayers et al., 2003; Bradley et al., 1988; Roll, 1986; Walkling & Edmister, 1985).

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<sup>3</sup> The effect of one standard deviation increase of the GPscore coefficient in Regression 1: (SD x coefficient x 100) = 21.84 x 0.0009 x 100 = 1.9656.

**Model 1**

DV = Premium4w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	0.0003 (0.363)				
ESscore		-0.0001 (-0.212)			
Escore			-0.0002 (-0.310)		
Sscore				-0.0000 (-0.040)	
Gscore					0.0009* (1.667)
Size	-0.0236* (-1.837)	-0.0210 (-1.583)	-0.0206 (-1.560)	-0.0219* (-1.752)	-0.0255** (-2.214)
MTB	-0.0048** (-2.343)	-0.0048** (-2.338)	-0.0048** (-2.340)	-0.0048** (-2.340)	-0.0046** (-2.280)
Leverage	0.0902 (1.539)	0.0870 (1.474)	0.0865 (1.469)	0.0880 (1.501)	0.0929 (1.600)
Growth	0.0003 (1.006)	0.0003 (0.930)	0.0003 (0.916)	0.0003 (0.952)	0.0004 (1.195)
Liquidity	0.0048 (0.779)	0.0046 (0.747)	0.0046 (0.746)	0.0046 (0.754)	0.0054 (0.861)
R&D	0.3832 (0.944)	0.4050 (0.995)	0.4096 (0.993)	0.3961 (0.985)	0.3895 (0.953)
ROE	-0.0289 (-1.038)	-0.0281 (-1.014)	-0.0279 (-1.002)	-0.0284 (-1.023)	-0.0294 (-1.053)
Capex	0.1310 (0.547)	0.1281 (0.533)	0.1293 (0.536)	0.1284 (0.536)	0.1331 (0.558)
Cash	0.0717*** (2.662)	0.0718*** (2.689)	0.0718*** (2.689)	0.0719*** (2.686)	0.0694** (2.574)
Competition	0.1725*** (4.175)	0.1739*** (4.178)	0.1739*** (4.165)	0.1735*** (4.182)	0.1694*** (4.127)
Hostile	0.0221 (0.242)	0.0245 (0.271)	0.0242 (0.269)	0.0236 (0.260)	0.0280 (0.304)
Blockholder	-0.0675* (-1.847)	-0.0681* (-1.868)	-0.0678* (-1.865)	-0.0680* (-1.863)	-0.0651* (-1.783)
Crossborder	0.0051 (0.192)	0.0060 (0.226)	0.0061 (0.228)	0.0058 (0.217)	0.0039 (0.146)
Horizontal	0.0314 (1.117)	0.0318 (1.132)	0.0318 (1.133)	0.0317 (1.128)	0.0306 (1.086)
Acqpubl	0.0494 (1.591)	0.0487 (1.578)	0.0487 (1.580)	0.0490 (1.579)	0.0475 (1.535)
Constant	0.1434 (0.938)	0.1400 (0.898)	0.1348 (0.838)	0.1433 (0.936)	0.1113 (0.727)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	869	869	869	869	869
R-squared	0.253	0.253	0.253	0.252	0.256
Maximum VIF	2.44	2.49	2.45	2.36	2.17

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust t-statistics in parentheses.

*Table 6: Regression output for Model 1*

## 5.2. Model 2 - ESG performance and the M&A premium for deals with public acquirers

The descriptive statistics for Model 2 are shown in Table 3. Since the data in Model 2 is derived from Model 1, the same conclusions about running separate regressions are made. Therefore, no bivariate correlation is made for Model 2.

### 5.2.1. Univariate analysis

Table 7 displays the results from the univariate analysis for Model 2. First, we see no significant difference in the M&A premium for private vs. public acquirers deals. The result does not differ for any interaction term either. Hence, the univariate analysis for Model 2 does not indicate that there would be any difference in the M&A premium between high scorers vs. low scorers, nor between private and public acquirers.

	Group	Obs	Mean	Test of difference
All scores	Private Acq	361	0.32	0.61
All scores	Public Acq	508	0.31	0.61
ESGscore x Acqpubl	< Median	434	0.32	0.58
ESGscore x Acqpubl	> Median	435	0.30	0.58
Esscore x Acqpubl	< Median	434	0.32	0.45
Esscore x Acqpubl	> Median	435	0.30	0.45
Escore x Acqpubl	< Median	434	0.31	0.88
Escore x Acqpubl	> Median	435	0.31	0.88
Sscore x Acqpubl	< Median	434	0.31	0.86
Sscore x Acqpubl	> Median	435	0.31	0.86
Gscore x Acqpubl	< Median	434	0.31	1.00
Gscore x Acqpubl	> Median	435	0.31	1.00

\* p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 7: Univariate analysis for the data for Model 2

### 5.2.2. Multivariate regression analysis

A second regression is performed to deepen the understanding of the first hypothesis and disentangle the possible impact that public acquirers may have. An interaction term between each ESG score and the new binary variable “PublDum,” which equals “1” when the acquirer is public and “0” otherwise. The results of Model 2 are reported in Table 8. These regressions include variables with an interaction term if the acquirer is publicly traded. All interaction variables are positive and significant, except for the interaction term for Gscore, which is not significant. This indicates that the M&A premium is positively related to the ESGscore, ESScore, Escore and Sscore of the target company when the acquirer is public. When comparing the control variable output to Model 1, no differences are notable.

**Model 2**

DV = Premium4w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	-0.0006 (-0.662)				
ESG x Acqpubl	0.0014** (2.076)				
ESscore		-0.0011 (-1.306)			
ESscore x Acqpubl		0.0015** (2.187)			
Escore			-0.0011 (-1.604)		
Escore x Acqpubl			0.0016** (2.252)		
Sscore				-0.0007 (-0.976)	
Sscore x Acqpubl				0.0012* (1.946)	
Gscore					0.0004 (0.585)
Gscore x Acqpubl					0.0010 (1.554)
Size	-0.0237* (-1.862)	-0.0214 (-1.616)	-0.0209 (-1.587)	-0.0221* (-1.774)	-0.0254** (-2.212)
MTB	-0.0048** (-2.346)	-0.0047** (-2.301)	-0.0048** (-2.363)	-0.0046** (-2.258)	-0.0047** (-2.323)
Leverage	0.0926 (1.579)	0.0889 (1.509)	0.0874 (1.484)	0.0897 (1.534)	0.0944 (1.621)
Growth	0.0003 (1.073)	0.0003 (0.984)	0.0003 (0.941)	0.0003 (1.018)	0.0004 (1.260)
Liquidity	0.0047 (0.773)	0.0044 (0.726)	0.0045 (0.736)	0.0045 (0.732)	0.0054 (0.877)
R&D	0.3709 (0.914)	0.3976 (0.977)	0.4138 (1.001)	0.3796 (0.946)	0.3761 (0.921)
ROE	-0.0286 (-1.037)	-0.0276 (-1.003)	-0.0262 (-0.950)	-0.0289 (-1.046)	-0.0295 (-1.062)
Capex	0.1346 (0.566)	0.1297 (0.544)	0.1290 (0.539)	0.1280 (0.537)	0.1341 (0.563)
Cash	0.0715*** (2.770)	0.0706*** (2.796)	0.0671*** (2.742)	0.0701*** (2.720)	0.0665*** (2.579)
Competition	0.1726*** (4.169)	0.1733*** (4.158)	0.1740*** (4.165)	0.1721*** (4.141)	0.1697*** (4.129)
Hostile	0.0154 (0.172)	0.0168 (0.194)	0.0150 (0.175)	0.0177 (0.200)	0.0237 (0.254)
Blockholder	-0.0663* (-1.806)	-0.0668* (-1.822)	-0.0673* (-1.845)	-0.0675* (-1.842)	-0.0650* (-1.778)
Crossborder	0.0043 (0.162)	0.0060 (0.225)	0.0078 (0.295)	0.0055 (0.209)	0.0040 (0.147)
Horizontal	0.0304 (1.177)	0.0309 (1.225)	0.0336 (1.348)	0.0322 (1.265)	0.0339 (1.286)
Constant	0.1796 (1.202)	0.1754 (1.151)	0.1688 (1.078)	0.1813 (1.209)	0.1499 (1.004)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	869	869	869	869	869
R-squared	0.254	0.255	0.255	0.253	0.256
Maximum VIF	2.44	2.5	2.75	2.36	2.17

Robust t-statistics in parentheses.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 8: Regression output for Model 2

### 5.3. Model 3 - ESG gap and the M&A premium

#### 5.3.1. Descriptive statistics

Table 9 exhibits the descriptive statistics for Model 3, constituting 339 deals. The dependent variable Premium4w has a mean of 0.31, which gives an average M&A premium of 31%. The minimum M&A premium equals -57%, while the maximum premium is 146%. The standard deviation equals 32%, but similar to the statistics for Model 1 and Model 2, the median premium is close to the mean, which indicates that it is not skewed. All mean gaps are slightly similar to the median gaps as well. Egap, which proves to be statistically significant in the multivariate regression analysis, has a mean of -18.742 and a median of -12.60, with a standard deviation of 33.33%.

Considering the deal characteristics variables, competition is slightly lower than the data set for Model 1 and Model 2. The same applies to the blockholder variables. In this data set, 80% of the deals are horizontal, i.e., when the acquiring and target firms are in the same industry. In the other data set, this share equals 59%.

Variable	N	Mean	p25	p50	p75	SD	Min	Max
Premium4w	339	0.31	0.12	0.27	0.46	0.32	-0.57	1.46
ESGgap	339	-14.19	-30.87	-12.39	3.73	23.88	-76.23	58.88
ESgap	339	-16.07	-38.03	-12.55	3.15	27.47	-82.87	71.45
Egap	339	-18.74	-47.27	-12.60	0.46	33.33	-90.68	83.95
Sgap	339	-13.39	-30.84	-10.98	4.34	26.62	-82.78	58.94
Ggap	339	-11.35	-33.58	-9.95	9.27	30.68	-82.34	72.08
Size	339	8.04	7.00	8.13	9.00	1.59	4.28	11.62
Leverage	339	0.27	0.09	0.24	0.40	0.22	0.00	1.01
Growth	339	13.53	-0.85	5.85	16.72	36.36	-43.57	246.27
Liquidity	339	1.95	0.70	1.36	2.25	2.55	0.00	17.60
R&D	339	0.02	0.00	0.00	0.01	0.05	0.00	0.24
ROE	339	0.15	0.00	0.08	0.15	1.03	-2.63	7.91
Capex	339	0.05	0.01	0.03	0.06	0.07	0.00	0.42
Cash	339	0.35	0.00	0.00	1.00	0.48	0.00	1.00
Competition	339	0.08	0.00	0.00	0.00	0.27	0.00	1.00
Hostile	339	0.01	0.00	0.00	0.00	0.08	0.00	1.00
Blockholder	339	0.12	0.00	0.00	0.00	0.32	0.00	1.00
Crossborder	339	0.34	0.00	0.00	1.00	0.48	0.00	1.00
Horizontal	339	0.80	1.00	1.00	1.00	0.40	0.00	1.00
Acqpubl	339	0.99	1.00	1.00	1.00	0.08	0.00	1.00

Table 9: Descriptive statistics for Model 3

#### 5.3.2. Bivariate correlation

Table 10 showcases the relationship between the different gaps. The correlation between the combined score gaps (ESGgap, ESgap) are the highest due to the combination of each different score. The correlations between the different independent gaps are lower. However, they note correlations between 30.4-35.6%. This provides enough information to draw the same conclusions as the previous bivariate correlation about separating the gaps in different

regressions in the model. ESGgap and ESgap are included to stay consistent with the previous models and for the curiosity of testing the different gap-score combinations.

	ESGgap	ESgap	Egap	Sgap	Ggap
ESGgap	1.000				
ESgap	0.913***	1.000			
Egap	0.814***	0.934***	1.000		
Sgap	0.866***	0.894***	0.676***	1.000	
Ggap	0.677***	0.356***	0.304***	0.355***	1.000

\* p<0.05, \*\*p<0.01, \*\*\*p<0.001

Table 10: Correlation matrix for the ESG gaps

### 5.3.3. Univariate analysis

The univariate analysis in Table 11 showcases the difference in the M&A premium between the deals with gaps above vs. below the median. Due to the uneven number of observations, there is one more in the second group. The results showcase that the ESGgap, the ESgap, and the Egap have significant differences in the M&A premium between the different groups. Neither the Sgap nor the Ggap showcase significant differences between the groups.

	Group	Obs	Mean	Test of difference
<b>ESGgap</b>	< Median	169	0.34	0.09*
<b>ESGgap</b>	> Median	170	0.28	0.09*
<b>ESgap</b>	< Median	169	0.35	0.03**
<b>ESgap</b>	> Median	170	0.27	0.03**
<b>Egap</b>	< Median	169	0.36	0.01***
<b>Egap</b>	> Median	170	0.26	0.01***
<b>Sgap</b>	< Median	169	0.32	0.56
<b>Sgap</b>	> Median	170	0.30	0.56
<b>Ggap</b>	< Median	169	0.30	0.84
<b>Ggap</b>	> Median	170	0.31	0.84

Table 11: Univariate analysis for the data for Model 3

### 5.3.4. Multivariate regression analysis

The results for Model 3 can be seen in Table 13. The environmental gap (Egap) is the only significant gap, which is negative. This indicates that the higher the difference between the target firm's environmental score and the acquirer firm's environmental score before the deal, the lower the M&A premium. More precisely, one standard deviation increase in the

environmental gap decreased the premium paid by 4.33<sup>4</sup> percentage points. The results in Regression 3 show that the environmental gap has a negative relation with the M&A premium. The control variable MTB is negative and significant, and the control variable competition is positive and significant for all models. This is in line with the results of Model 1 and Model 2. No other control variable is significant.

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<sup>4</sup> The effect of one standard deviation increase of the Egap coefficient in Regression 2: (SD x coefficient x 100)  
= 33.33 x -0.0013 x 100 = -4.3329

**Model 3**

DV = Premium4w	ESGgap (1)	ESgap (2)	Egap (3)	Sgap (4)	Ggap (5)
ESGgap	-0.0004 (-0.362)				
ESgap		-0.0012 (-1.420)			
Egap			-0.0013* (-1.939)		
Sgap				-0.0004 (-0.497)	
Ggap					0.0010 (1.383)
Size	-0.0257 (-1.301)	-0.0240 (-1.245)	-0.0229 (-1.194)	-0.0257 (-1.308)	-0.0260 (-1.310)
MTB	-0.0050** (-2.567)	-0.0050** (-2.519)	-0.0049** (-2.464)	-0.0050** (-2.577)	-0.0049*** (-2.632)
Leverage	0.1889 (1.607)	0.1871 (1.644)	0.1881* (1.682)	0.1872 (1.603)	0.1800 (1.511)
Growth	0.0008 (1.051)	0.0008 (1.062)	0.0007 (1.023)	0.0008 (1.068)	0.0008 (1.105)
Liquidity	0.0100 (1.258)	0.0090 (1.134)	0.0087 (1.099)	0.0100 (1.263)	0.0114 (1.401)
R&D	0.5204 (0.968)	0.5315 (1.008)	0.5408 (1.043)	0.5146 (0.961)	0.4534 (0.823)
ROE	-0.0157 (-1.014)	-0.0154 (-1.002)	-0.0155 (-1.018)	-0.0156 (-1.011)	-0.0166 (-1.076)
Capex	-0.2670 (-0.763)	-0.2918 (-0.834)	-0.2880 (-0.823)	-0.2685 (-0.773)	-0.2053 (-0.587)
Cash	0.0662 (1.489)	0.0541 (1.203)	0.0510 (1.144)	0.0653 (1.461)	0.0761* (1.753)
Competition	0.2406*** (2.646)	0.2469*** (2.673)	0.2500*** (2.712)	0.2407*** (2.646)	0.2300** (2.549)
Hostile	-0.0737 (-0.485)	-0.0219 (-0.135)	-0.0309 (-0.187)	-0.0624 (-0.406)	-0.0918 (-0.664)
Blockholder	-0.0508 (-0.576)	-0.0512 (-0.579)	-0.0526 (-0.593)	-0.0506 (-0.575)	-0.0482 (-0.554)
Crossborder	0.0004 (0.008)	-0.0086 (-0.196)	-0.0137 (-0.314)	-0.0003 (-0.007)	0.0002 (0.005)
Horizontal	-0.0386 (-0.655)	-0.0425 (-0.727)	-0.0417 (-0.723)	-0.0388 (-0.657)	-0.0270 (-0.469)
Acqpubl	0.0095 (0.052)	-0.0121 (-0.064)	-0.0176 (-0.092)	0.0087 (0.048)	0.0390 (0.220)
Constant	0.2432 (0.913)	0.2453 (0.906)	0.2315 (0.842)	0.2458 (0.923)	0.2123 (0.803)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	339	339	339	339	339
R-squared	0.331	0.337	0.343	0.331	0.337
Maximum VIF	2.61	2.62	2.62	2.61	2.60

Robust t-statistics in parentheses.

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

Table 12: Regression output for Model 3

#### **5.4. Robustness tests and propensity score matching**

Two additional dependent variables will be used for new regressions for Model 1 and Model 2. This is to check for robustness depending on the time frame before the announcement date. The regressions in Appendix 5.1 show the M&A premium 1 day prior to announcement day. The difference between the 4-week premium as a dependent variable is the higher significance of the Gscore. Appendix 5.2 showcases the 1-week premium, where no major changes are seen compared to the 4-week premium. Significance is still shown for the Gscore and the same control variables. When changing the size measure to relative size for Regression 1 in Appendix 5.3, no output for the different ESG measures is significant. A notable change when changing the size measure is the decrease in the number of observations. This may affect the sample characteristics since the relative measures exclude most private acquirers due to a lack of data for the total assets of the acquiring firms. Model 2 displayed significant results for the interaction term for ESG, ESscore, Escore, and Sscore. None of these are significant when changing the dependent variable to 1 day-premium or 1 week-premium, nor when changing the size variable to relative size instead of size, as shown in Appendix 6.

The robustness test for Model 3 contains two regressions with measurement changes of the dependent variable and one regression with measurement changes of the control variable size. The 1-day premium regression is shown in Appendix 7.1. The 1-week premium regression is shown in appendix 7.2. Similar to Model 3, the only significant ESG score is the environmental gap. In Appendix 7.3, the relative size between the acquiring firm and target firm is included instead of only the size of the target firm. The results showcase that the environmental gap still is significant and has a negative impact on the M&A premium.

When it comes to the propensity score matching, the output of the analyses can be seen in Table 14. It shows the estimated effect the target ESG scores have on the M&A premium. The output shows that the result from the propensity score matching confirms the previous results from Model 1. Additionally, we can see that the propensity score matching showcases targets within the group that has scored above the mean ESGscore, and ESscore receives a higher premium. We do not find evidence for this in Model 1.

After balancing the key covariates, targets with higher scores within Model 2 do not receive a higher M&A premium relative to comparable targets with lower scores. Some of these findings are inconsistent with the results from the main regressions. For Model 2, except for

the GP interaction score, all variables were significant and positive. For Model 3, the environmental gap was significant and negative. In the propensity score matching no gap showcases significant results.

<b>Matching outcome: Model 1</b>	<b>ESG</b>	<b>ESscore</b>	<b>Escore</b>	<b>Sscore</b>	<b>Gscore</b>
Matched observations per treated deal	4:1	4:1	4:1	4:1	4:1
ATET	0.107***	0.096**	0.038	0.058	0.118***
Standard errors	0.039	0.038	0.039	0.039	0.038
p-value	0.007	0.012	0.333	0.139	0.002
<b>Matching outcome: Model 2</b>	<b>ESG x Acqpubl</b>	<b>ESscore x Acqpubl</b>	<b>Escore x Acqpubl</b>	<b>Sscore x Acqpubl</b>	<b>Gscore x Acqpubl</b>
Matched observations per treated deal	4:1	4:1	4:1	4:1	4:1
ATET	0.032	0.027	0.053	0.049	0.040
Standard errors	0.030	0.033	0.042	0.032	0.031
p-value	0.279	0.408	0.202	0.126	0.198
<b>Matching outcome: Model 3</b>	<b>ESGgap</b>	<b>ESgap</b>	<b>Egap</b>	<b>Sgap</b>	<b>Ggap</b>
Matched observations per treated deal	4:1	4:1	4:1	4:1	4:1
ATET	0.006	-0.027	-0.033	0.024	0.001
Standard errors	0.039	0.037	0.041	0.042	0.044
p-value	0.875	0.467	0.424	0.565	0.973

*Table 13: Propensity score matching analysis*

## 5.5. Limitations

Using a database with selection criteria comes with its limitations. For example, in order to collect the relevant deals for this thesis, we needed the target companies and, to some extent, the acquirers to have ESG scores for a given time. Other sample selection criteria are limiting the sample and possibly the outcome. This limited our sample and could affect the actual outcome. Additionally, the results in this study are based on the definition and the methodology of the different ESG scores provided by the Refinitiv database.

Further, there are some limitations regarding the usage of ESG scores within research. There is no globally aligned reporting standard for ESG data. ESG data is not mandatory nor audited for all companies or countries. Many deals were excluded from the sample due to a lack of ESG data. Hence, there might be issues with sample selection bias as the sample was not selected randomly.

## 6. Discussion

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*In this section, we will discuss the results from this thesis with regards to the theories used and previous studies. First, we discuss Model 1 (6.1), followed by Model 2 (6.2), and we finish with discussing Model 3 (6.3).*

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### 6.1. ESG performance and the M&A premium

***Hypothesis 1:*** *The M&A premium is positively related to the ESG score of the target firm.*

The target company's ESG performance has proven valuable to the acquiring firms for one score. For the Gscore, a positive value effect on the M&A premium has been shown, which holds in the robustness test with different time frames on the dependent variables and the propensity score matching. This indicates that the target company's shareholders benefit from a higher pre-deal Gscore, as the M&A premium in a transaction increases when Gscore is higher. Since the Gscore is a proxy for the governance activities within ESG for a company, it is reasonable to say that in the context of M&A, a target prospect benefits from enhancing the relation to different stakeholders within the organization. The Gscore includes the firm's CSR structure, management structure, other compensation structures, shareholder's rights, and M&A defenses. Hence, the target should enhance these specific categories within the Gscore to receive a higher M&A premium in a transaction. The results are consistent with the stakeholder theory, showing that the target firm's shareholders benefit from engaging in Gscore enhancing activities, which benefits other stakeholders. Since the Gscore has previously not been studied to a similar extent, these findings provide new evidence in the debate whether ESG is value-enhancing.

The results for the other scores (ESG, ESScore, Escore, Sscore) do not support Hypothesis 1 since there are no significant results for them in the output. Therefore, no conclusions can be drawn to support either the stakeholder theory or the shareholder theory. These findings align with Jost et al. (2021), who do not find significant results for any ESG score. The results do not follow Gomes and Marsat (2018) or Qiao and Wu (2019), who find a significant and positive relationship between the M&A premium and the CSR score. Compared to Gomes and Marsat (2018) and Qiao and Wu (2019), the difference in results can be explained through different time frames since they cover other years in their sample. Further, the difference to Qiao and Wu (2019) might be explained through their exclusion of domestic deals, which constitute 66% of this study's sample. Although, in the propensity score

matching, the ESGscore and the ESscore are positive and significant. This indicates that target firms with higher ESG scores and ESscore than the average receive higher M&A premiums. Although, no significant relation is found in the primary model with another method and more control variables.

## **6.2. ESG performance and the M&A premium for deals with public acquirers**

*Hypothesis 2: The M&A premium is positively related to the ESG score of the target firm when the acquirer is public.*

In the sample, 58% of the acquiring firms are publicly traded. The results from the multivariate regression analysis showcase a positive and significant relationship for the interaction terms for ESG, ESscore, Escore, and Sscore and the public status of the acquirer. This indicates that when these scores are higher for the target company, there is a positive value effect on the M&A premium when the acquirer is public. This indicates support for Hypothesis 2 and that the stakeholder view holds when the acquirer is public. This could be because it has been found that public firms generally pay higher M&A premiums (Bargeron et al., 2008) or because public acquirers have proven to benefit from acquiring targets with high ESG performance (Tampakoudis & Anagnostopoulou, 2019). If having a high ESG score, the target firm and its investment bank could benefit from contacting public companies in a bidding process. However, Model 2 did not show robustness for the 1-day-premium, 4-week-premium, or the change of size variable. Neither did the results hold in the propensity score matching.

## **6.3. ESG gap and the M&A premium**

*Hypothesis 3: The M&A premium is positively related to the ESG gap between the target firm and the acquiring firm.*

The gap between the targets' and the acquirers' environmental scores are shown to have a negative value effect on the M&A premium in a transaction. This indicates that the target firm benefits from having a lower Escore than the acquiring firm. To maximize the M&A premium, they should aim for as low Escore as possible and seek buyers with as high scores as possible. This relation was not found in Model 1, where the Escore was analyzed independently from the Escore of the acquiring firm. Although, when analyzing the scores as a gap, this relation is found. Hypothesis 3 is therefore rejected for the Egap. These findings are contrary to Hussain and Shams (2022), who showcase that when the target firm has a

higher EScore than the acquiring firm, the M&A premium increases. The results may appear due to different time frames and the exclusion of specific industries of the acquiring firm. Additionally, the results were robust for the 1-day-premium, 4-week-premium, and the change of size variable. However, significant results are not found when the propensity score analysis is carried out. Important to note is the usage of fewer control variables in the propensity score matching analysis, and it showcases the results of a different method compared to the multivariate regression.

No other gap (ESGgap, ESgap, Sgap, Ggap) showcases significant results, and no conclusions can be drawn from them. Ggap is the only positive ESG score, although it is not significant. If these results had been significant, we would have found support for the stakeholder view, as we did in Model 1 for this score. The other scores would have supported the shareholder view if they were significant since they show a negative relation. Although, the univariate analysis showcased significant differences in the M&A premium between ESGgap and ESgap above and below the median. The univariate analysis does not take the control variables into account. The results of the univariate analysis may indicate that our method has not been suitable, as there might have been a nonlinear relation for these scores.

## 7. Conclusion

This study aims to empirically examine what effects the ESG performance of the target firms has on the M&A premium. Our results find support for both stakeholder theory and the shareholder theory.

In Model 1, we find that a higher pre-deal Gscore for the target company is positively related to the M&A premium, which supports the stakeholder theory. Target companies benefit from high governance performance, as measured by the Gscore. These findings are consistent through all analyses and robustness checks with different time frames on the dependent variables. In Model 2, the acquirer's public status and its effect on M&A premium were examined. The results show that all pre-deal ESG scores, except for the Gscore, are subject to higher M&A premiums. Although, the findings in Model 2 were not shown to be robust when doing the robustness tests or propensity score matching analysis. In Model 3, this study finds empirical evidence for the impact of the pre-deal environmental gap on the M&A premium. Target companies benefit from a negative Egap, which occurs when the Escore of the target company is lower than the Escore of the acquiring company. They benefit from having as low scores as possible. Investing in activities that enhance the Escore is hence value-destroying for the target when being acquired. This claim supports the shareholder theory. The findings are robust, although they do not pass the propensity score matching.

This study contributes to the academic debate by adding new empirical evidence to existing research. In particular, the governance score has not been studied as extensively as the other ESG scores for M&A premium in related studies. This study has proven that high governance performance is value-creating for the target firm's shareholders during a takeover, but is also beneficial for other stakeholders that benefit from Gscore-enhancing activities. These findings may support the decision-makers of the target firm when it comes to investments that will increase the sustainable governance performance, such as CSR strategy, management structure, management compensation, shareholder's right, and M&A defenses.

Future research should continue elaborating on the relationship between M&A premium and the ESG performance of the target company. As we find robust evidence for the stakeholder theory regarding the Gscore, it would be interesting to see the drivers of higher M&A premiums from the acquiring firm's perspective. As Gondhalekar et al. (2004) find that agency problems within the acquiring firm influence the M&A premium, future research should focus on its impact in the context of acquiring firms with high ESG performances.

This could be an in-depth quantitative study using a proxy of agency problems within the acquiring firms. It could also be a qualitative analysis that explores how the managers of the acquiring firms perceive the governance performance of the target firm in an acquisition.

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## 9. Appendix

**Appendix 1: Pearson correlation matrix for Model 1**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(1) Premium4w	1																			
(2) ESG	0.024	1																		
(3) ESSCORE	0.028	0.919***	1																	
(4) ESCORE	0.019	0.815***	0.930***	1																
(5) SSCORE	0.035	0.854***	0.870***	0.629***	1															
(6) Gscore	0.023	0.669***	0.381***	0.360***	0.324***	1														
(7) Size	-0.151***	0.297***	0.351***	0.325***	0.306***	0.058	1													
(8) MTB	-0.119**	-0.103*	-0.108**	-0.104*	-0.088*	-0.069	0.084	1												
(9) Leverage	0.038	0.004	0.005	0.021	-0.018	0.051	0.078	-0.04	1											
(10) Growth	0.053	-0.263***	-0.210***	-0.184***	-0.196***	-0.250***	-0.107**	0.015	-0.107**	1										
(11) R&D	0.176***	-0.002	0.005	-0.072	0.107**	-0.087*	0.052	0.07	-0.109**	-0.012	1									
(12) ROE	-0.022	-0.055	-0.053	-0.057	-0.036	-0.015	0.023	-0.031	0.141***	-0.012	0.111**	1								
(13) Capex	0.029	-0.194***	-0.152***	-0.102*	-0.185***	-0.125**	-0.107**	-0.007	0.118**	0.445***	-0.142***	-0.028	1							
(14) Liquidity	0.194***	-0.112**	-0.099*	-0.130**	-0.036	-0.107**	-0.109**	-0.003	-0.169***	0.141***	0.294***	-0.064	0.021	1						
(15) Cash	0.143***	0.058	0.037	0.015	0.058	0.03	-0.169***	0.053	-0.091*	-0.034	0.138**	-0.101*	-0.077	0.103*	1					
(16) Competition	0.212***	0.154***	0.149***	0.102*	0.177***	0.132**	0.041	0.023	0.003	-0.096*	0.017	0.029	0.039	0.013	0.018	1				
(17) Hostile	0.016	0.121**	0.137**	0.130**	0.116**	0.02	0.016	-0.013	0.006	-0.018	-0.022	-0.003	0.033	0.088*	0.024	-0.022	1			
(18) Blockholder	-0.082	0.029	0.041	0.083	-0.025	-0.001	0.048	0.028	0.033	0.064	-0.102*	-0.066	0.076	-0.071	0.073	-0.037	0.091*	1		
(19) Crossborder	0.130**	0.086	0.08	0.074	0.071	0.051	-0.001	0.056	-0.074	-0.044	0.029	-0.083	-0.006	0.131**	0.246***	0.096*	0.026	0.025	1	
(20) Horizontal	-0.037	0.021	0.049	0.039	0.05	-0.041	0.098*	-0.055	-0.011	0.062	0.033	-0.041	0.022	-0.014	-0.055	0.091*	0.039	-0.088*	0.009	1

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Appendix 2: Pearson correlation matrix for Model 3**

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
(1) Premium4w	1																					
(2) ESGgap	-0.079	1																				
(3) ESGap	-0.128**	0.913***	1																			
(4) Egap	-0.171***	0.814***	0.934***	1																		
(5) Sgap	-0.049	0.866***	0.894***	0.676***	1																	
(6) Ggap	0.035	0.677***	0.356***	0.304***	0.355***	1																
(7) Size	-0.212***	0.096*	0.134**	0.161***	0.074	-0.001	1															
(8) MTB	-0.119**	-0.016	-0.042	-0.03	-0.05	0.034	-0.086	1														
(9) Leverage	0.038	0.001	-0.02	-0.003	-0.036	0.037	0.194***	-0.04	1													
(10) Growth	0.053	-0.074	-0.039	-0.059	-0.007	-0.116**	-0.181***	0.015	-0.107**	1												
(11) R&D	0.176***	-0.081	-0.100*	-0.117**	-0.061	-0.033	-0.296***	0.07	-0.109**	-0.012	1											
(12) ROE	-0.022	0.024	0.009	0.007	0.01	0.06	-0.035	-0.031	0.141***	-0.012	0.111**	1										
(13) Capex	0.029	-0.099*	-0.063	-0.061	-0.053	-0.125**	-0.175***	-0.007	0.118**	0.445***	-0.142***	-0.028	1									
(14) Liquidity	0.194***	-0.172***	-0.167***	-0.184***	-0.114**	-0.093*	-0.388***	-0.003	-0.169***	0.141***	0.294***	-0.064	0.021	1								
(15) Cash	0.143***	-0.203***	-0.250***	-0.236***	-0.220***	-0.045	-0.255***	0.053	-0.091*	-0.034	0.138**	-0.101*	-0.077	0.103*	1							
(16) Competition	0.212***	0.074	0.059	0.064	0.042	0.103*	-0.044	0.023	0.003	-0.096*	0.017	0.029	0.039	0.013	0.018	1						
(17) Hostile	0.016	0.110**	0.122**	0.088*	0.142***	0.017	0.029	-0.013	0.006	-0.018	-0.022	-0.003	0.033	0.088*	0.024	-0.022	1					
(18) Blockholder	-0.082	0.018	-0.004	-0.009	0.003	0.004	0.087	0.028	0.033	0.064	-0.102*	-0.066	0.076	-0.071	0.073	-0.037	0.091*	1				
(19) Crossborder	0.130**	-0.145***	-0.194***	-0.204***	-0.145***	-0.02	-0.113**	0.056	-0.074	-0.044	0.029	-0.083	-0.006	0.131**	0.246***	0.096*	0.026	0.025	1			
(20) Horizontal	-0.037	-0.04	0.005	0.031	-0.029	-0.087*	0.128**	-0.055	-0.011	0.062	0.033	-0.041	0.022	-0.014	-0.055	0.091*	0.039	-0.088*	0.009	1		
(21) Acqpubl	-0.011	-0.052	-0.039	-0.032	-0.041	-0.042	0.156***	-0.124**	0.01	0.035	-0.036	0.06	0.037	0.025	-0.104*	-0.123**	0.006	0.028	0.056	-0.039	1	

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

### Appendix 3: Summary of statistical test for normality

#### (1) Ramsey RESET test

<b>Model 1</b>	<b>ESG</b>	<b>ESscore</b>	<b>Escore</b>	<b>Sscore</b>	<b>Gscore</b>
F statistic	1.920	1.770	1.750	1.810	1.860
Prob > F	0.124	0.152	0.156	0.144	0.136

<b>Model 2</b>	<b>ESG x Acqpubl</b>	<b>ESscore x Acqpubl</b>	<b>Escore x Acqpubl</b>	<b>Sscore x Acqpubl</b>	<b>Gscore x Acqpubl</b>
F statistic	2.020	1.910	1.900	1.900	2.220
Prob > F	0.110	0.127	0.129	0.129	0.085

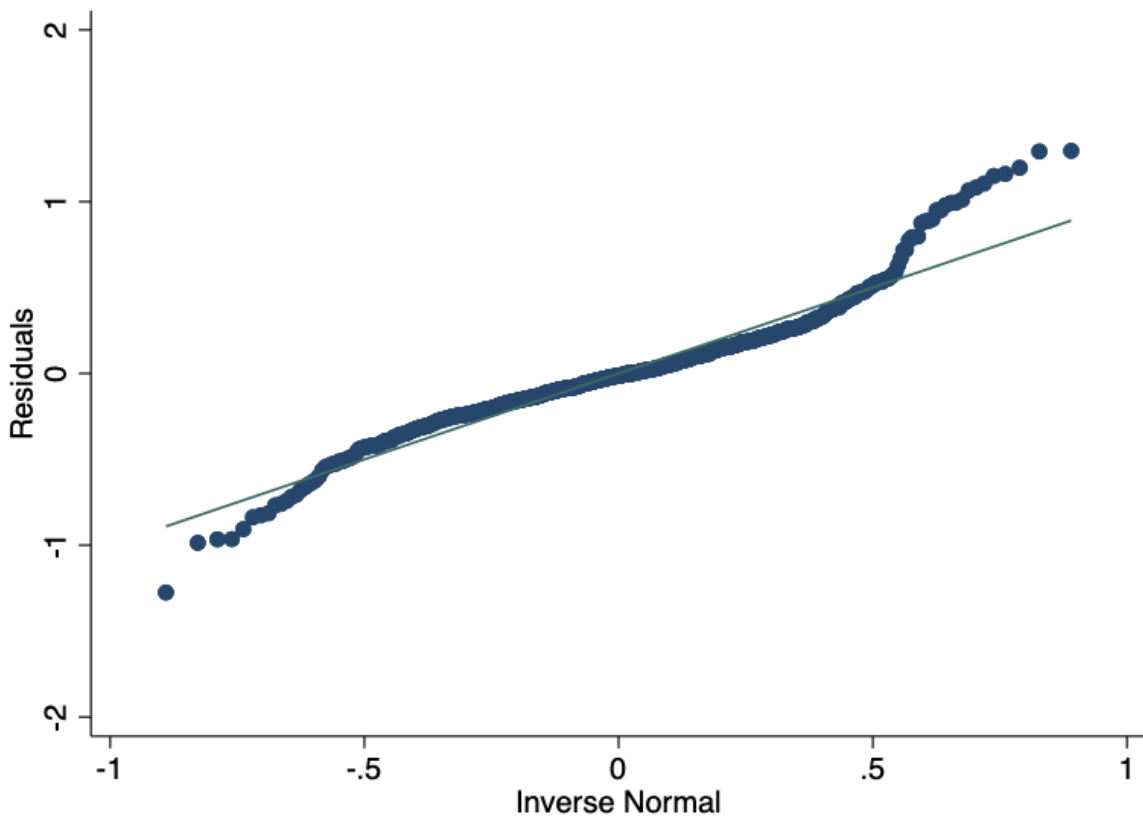
  

<b>Model 3</b>	<b>ESGgap</b>	<b>ESgap</b>	<b>Egap</b>	<b>Sgap</b>	<b>Ggap</b>
F statistic	1.680	1.500	1.660	1.650	2.430
Prob > F	0.172	0.214	0.176	0.178	0.066

**(2) Shapiro–Wilk W tests for normal data: Model 1 and Model 2**

Variable	Obs	Prob>z
Premium4w	869	0.0000
ESG	869	0.0000
ESG score x Acqpubl	869	0.0000
ESscore	869	0.0000
ESscore x Acqpubl	869	0.0000
Escore	869	0.0000
Escore x Acqpubl	869	0.0000
Sscore	869	0.0000
Sscore x Acqpubl	869	0.0000
Gscore	869	0.0000
Gscore x Acqpubl	869	0.0000
Size	869	0.0202
MTB	869	0.0000
Leverage	869	0.0000
Growth	869	0.0000
Liquidity	869	0.0000
R&D	869	0.0000
ROE	869	0.0000
Capex	869	0.0000

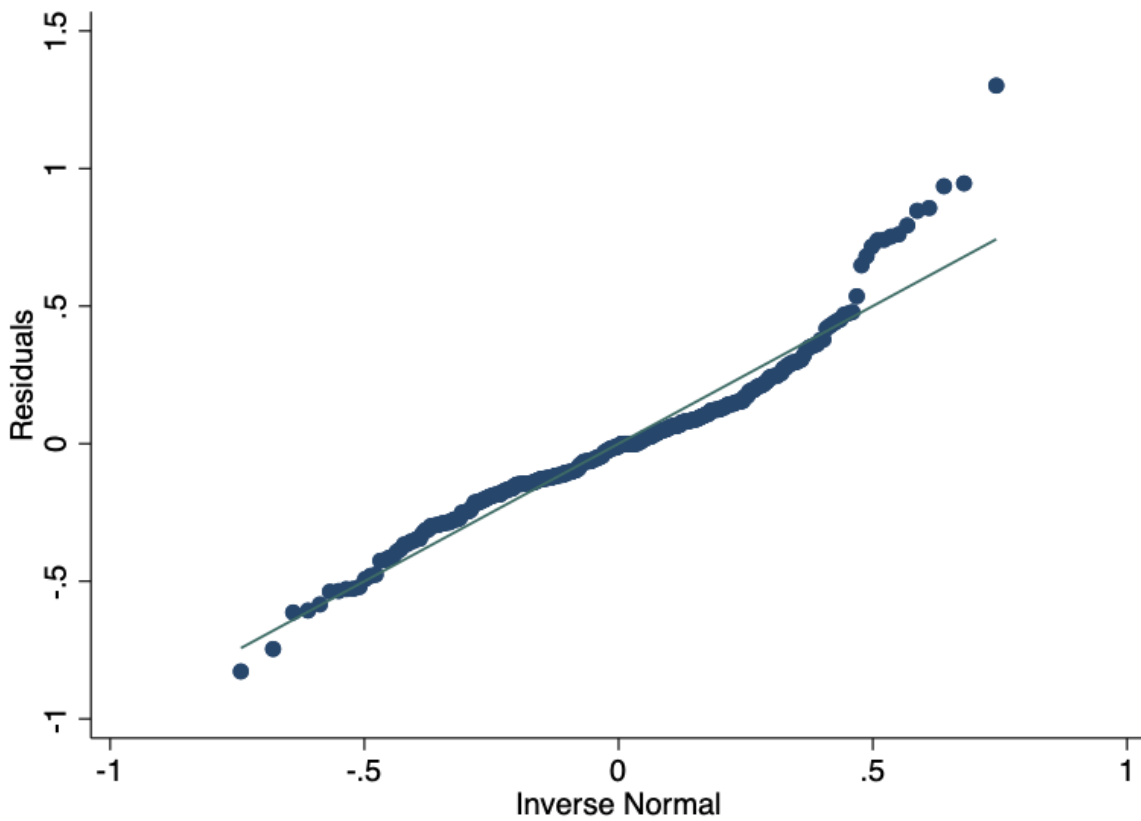
**Qnorm Model 1 and Model 2:**



*(2) Shapiro–Wilk W tests for normal data: Model 3*

Variable	Obs	Prob>z
Premium4w	339	0.000
ESGgap	339	0.039
ESgap	339	0.001
Egap	339	0.000
Sgap	339	0.037
Ggap	339	0.207
Size	339	0.462
MTB	339	0.000
Leverage	339	0.000
Growth	339	0.000
Liquidity	339	0.000
R&D	339	0.000
ROE	339	0.000
Capex	339	0.000

*Qnorm Model 3:*



**(5) Breusch-Pagan test**

<b>Model 1</b>	ESG	ESscore	Escore	Sscore	Gscore
Chi-squared	24.520	24.410	24.440	24.360	28.500
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000

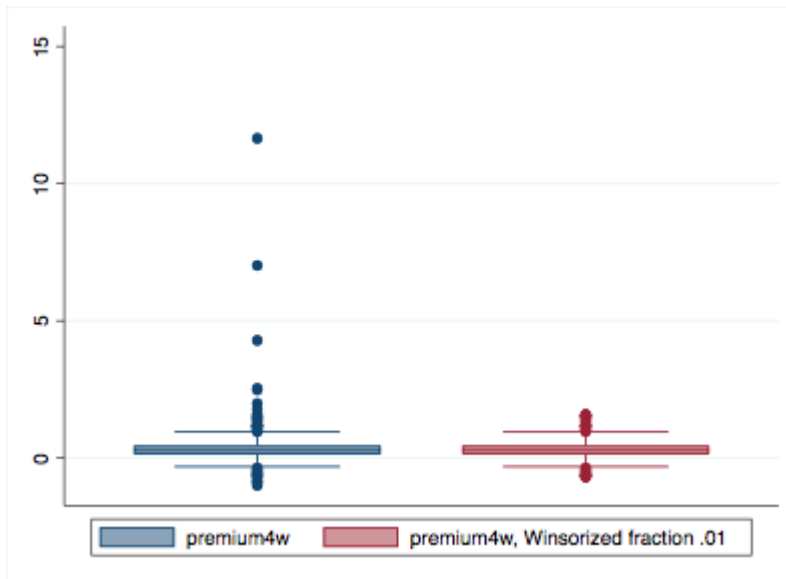
<b>Model 2</b>	ESG x Acqpubl	ESscore x Acqpubl	Escore x Acqpubl	Sscore x Acqpubl	Gscore x Acqpubl
Chi-squared	25.100	24.430	24.510	24.300	27.910
Prob > Chi-squared	0.000	0.000	0.000	0.000	0.000

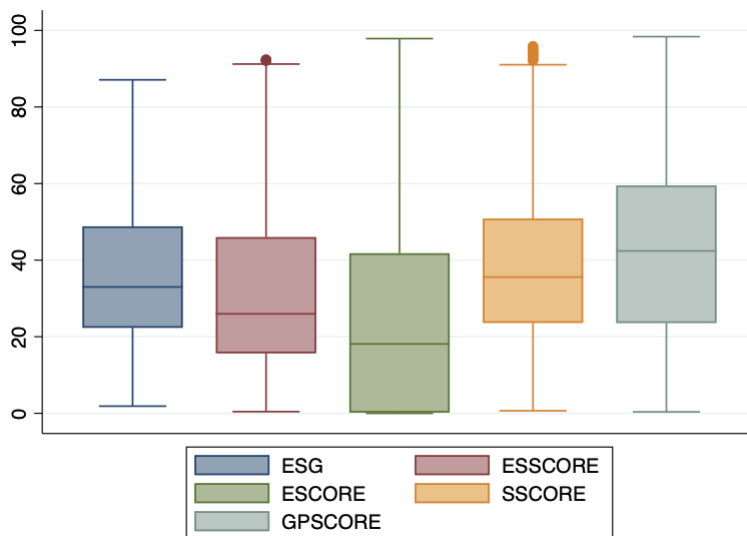
<b>Model 3</b>	ESGgap	ESgap	Egap	Sgap	Ggap
Chi-squared	7.850	9.440	8.740	8.390	9.070
Prob > Chi-squared	0.005	0.002	0.003	0.004	0.003

## Appendix 4: The variables before vs after cleaning

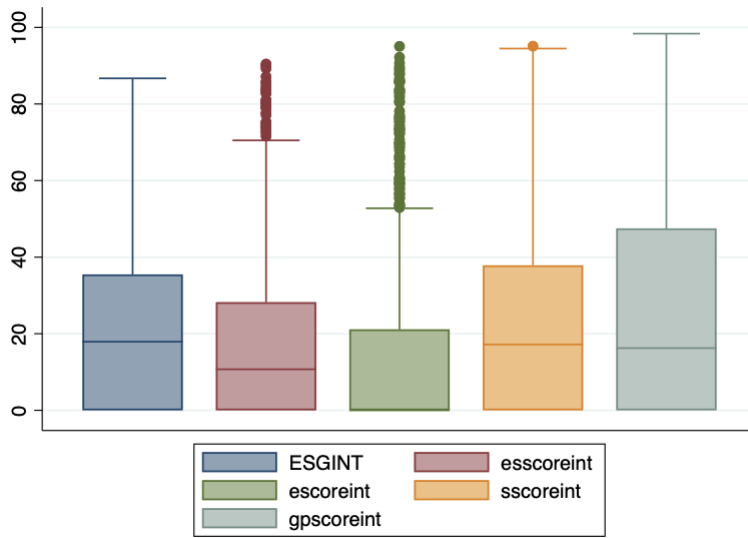
### *Premium4w*



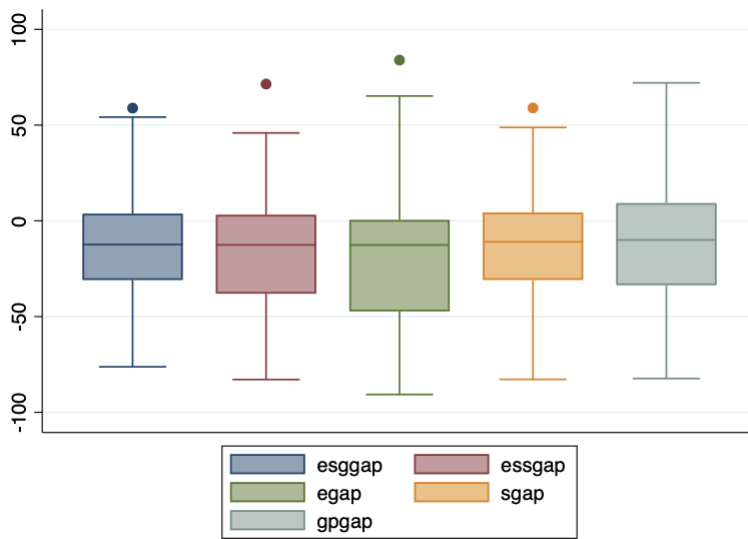
### *ESG, ESScore, EScore, Sscore, Gscore (no cleaning)*



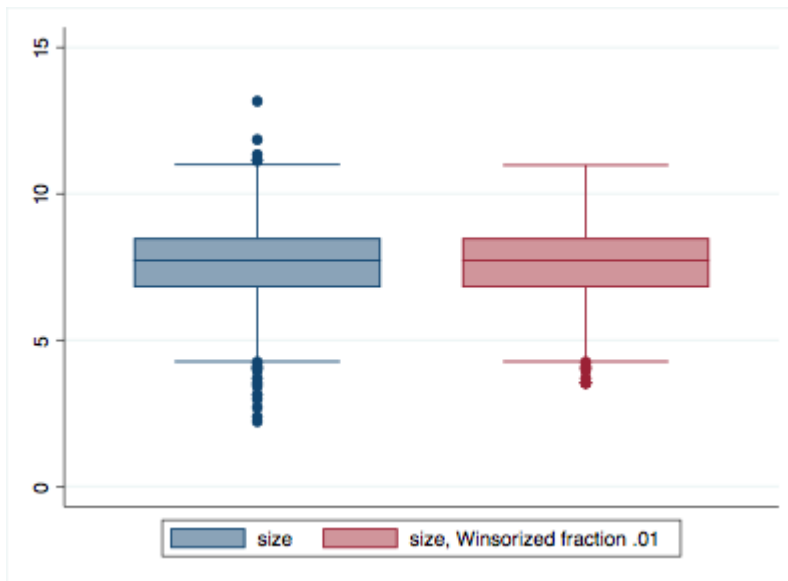
*ESGint, ESScoreint, Escoreint, Sscoreint, Gscoreint (no cleaning)*



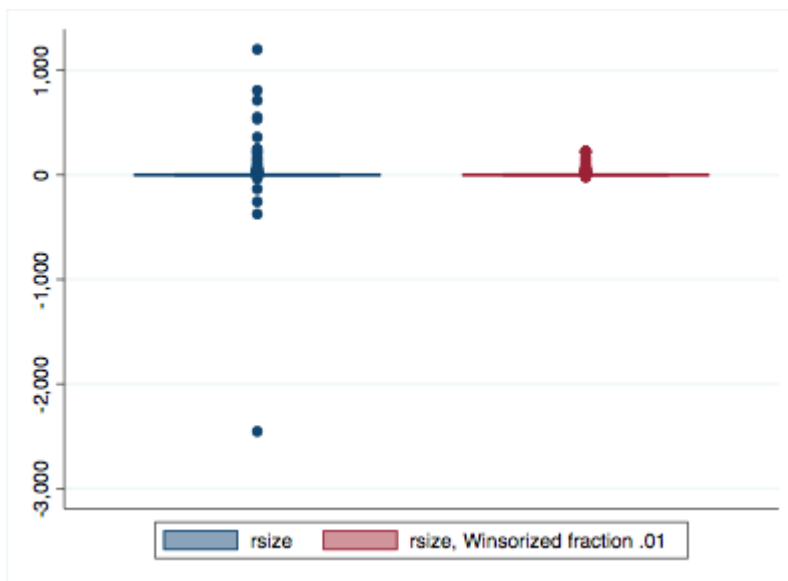
*ESGgap, ESGap, Egap, Sgap, Ggap (no cleaning)*



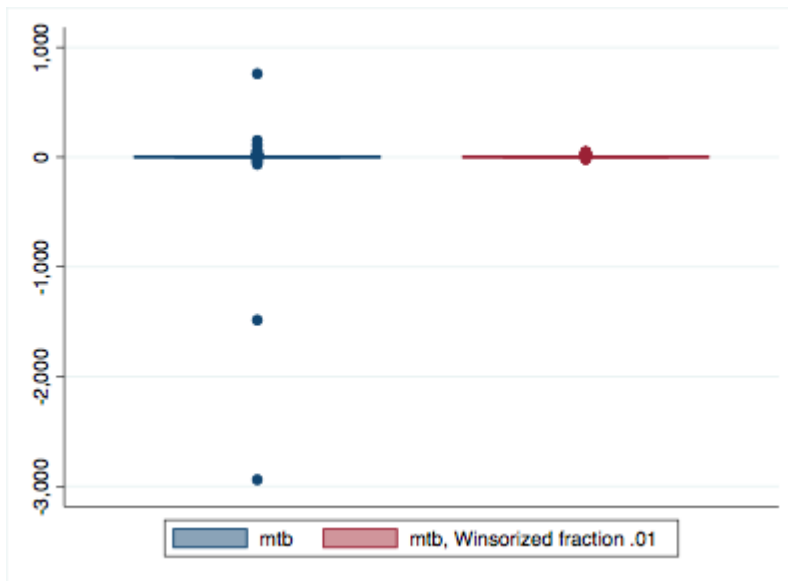
*Size*



*Rsize*



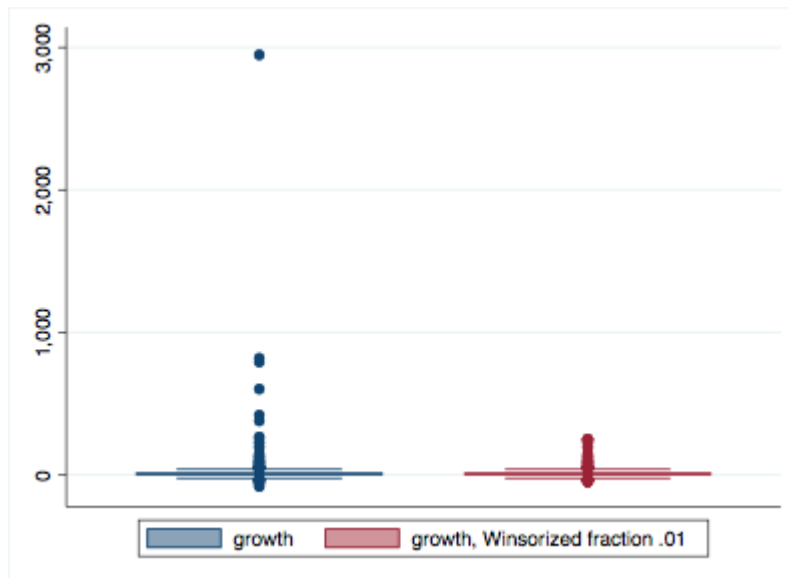
### *MTB*



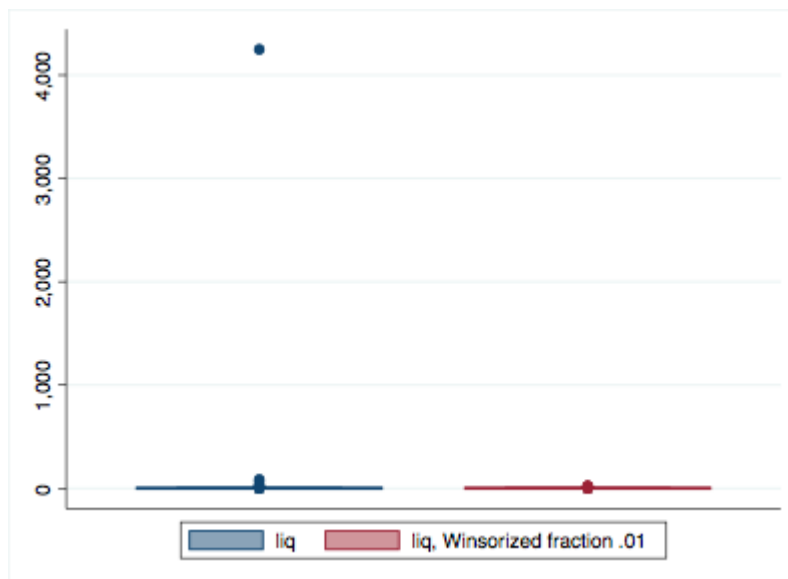
### *Leverage*



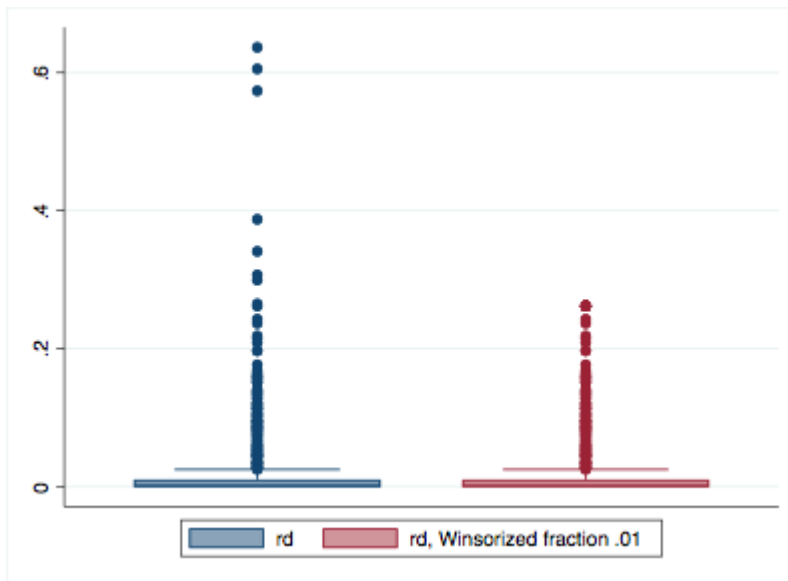
## Growth



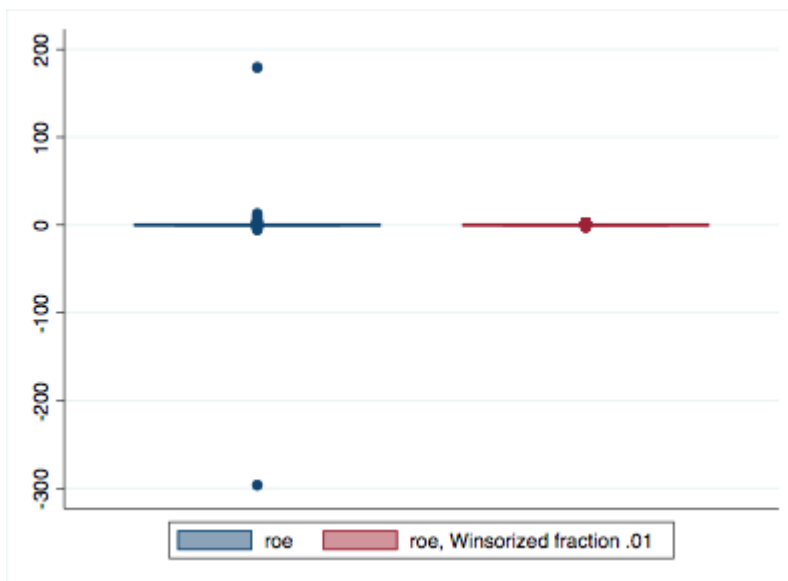
## Liquidity



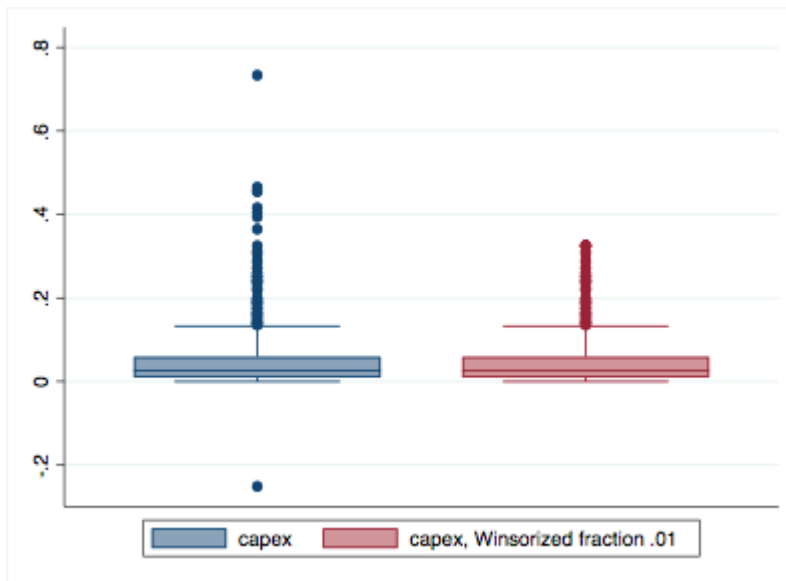
### *R&D*



### *ROE*



## Capex



## Appendix 5: Robustness test for Model 1

### 5.1 Dependent variable: 1 day premium

DV = Premium1d	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	0.0003 (0.465)				
ESscore		0.0000 (0.004)			
Escore			-0.0001 (-0.116)		
Sscore				0.0001 (0.153)	
Gscore					0.0011** (1.996)
Size	-0.0205* (-1.767)	-0.0188 (-1.546)	-0.0183 (-1.524)	-0.0193 (-1.644)	-0.0227** (-2.114)
MTB	-0.0038** (-2.028)	-0.0038** (-2.042)	-0.0038** (-2.038)	-0.0038** (-2.049)	-0.0036* (-1.935)
Leverage	0.0622 (0.998)	0.0599 (0.955)	0.0594 (0.946)	0.0605 (0.971)	0.0652 (1.055)
Growth	-0.0000 (-0.006)	-0.0000 (-0.061)	-0.0000 (-0.074)	-0.0000 (-0.053)	0.0001 (0.184)
Liquidity	0.0038 (0.554)	0.0036 (0.528)	0.0036 (0.525)	0.0037 (0.534)	0.0045 (0.641)
R&D	0.2420 (0.654)	0.2548 (0.688)	0.2600 (0.694)	0.2500 (0.681)	0.2492 (0.667)
ROE	-0.0244 (-0.841)	-0.0239 (-0.827)	-0.0237 (-0.818)	-0.0240 (-0.829)	-0.0249 (-0.858)
Capex	0.1451 (0.552)	0.1425 (0.541)	0.1427 (0.541)	0.1435 (0.545)	0.1474 (0.565)
Cash	0.0588** (2.161)	0.0590** (2.182)	0.0589** (2.181)	0.0590** (2.182)	0.0562** (2.073)
Competition	0.1476*** (3.905)	0.1486*** (3.914)	0.1488*** (3.918)	0.1482*** (3.916)	0.1442*** (3.837)
Hostile	-0.0142 (-0.157)	-0.0129 (-0.143)	-0.0125 (-0.140)	-0.0138 (-0.153)	-0.0077 (-0.083)
Blockholder	-0.0436 (-1.161)	-0.0441 (-1.178)	-0.0440 (-1.178)	-0.0439 (-1.169)	-0.0409 (-1.089)
Crossborder	0.0269 (0.958)	0.0276 (0.981)	0.0277 (0.985)	0.0274 (0.973)	0.0256 (0.913)
Horizontal	0.0010 (0.036)	0.0013 (0.046)	0.0013 (0.048)	0.0012 (0.044)	0.0001 (0.004)
Acqpubl	0.0345 (1.111)	0.0341 (1.104)	0.0340 (1.099)	0.0344 (1.109)	0.0324 (1.041)
Constant	-0.1852 (-1.239)	-0.1853 (-1.227)	-0.1882 (-1.217)	-0.1858 (-1.241)	-0.2210 (-1.454)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	869	869	869	869	869
R-squared	0.227	0.227	0.227	0.227	0.231
Maximum VIF	2.44	2.49	2.45	2.36	2.17

Robust t-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5.2 Dependent variable: 1 week premium

DV = Premium1w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	0.0004 (0.524)				
ESscore		0.0000 (0.052)			
Escore			-0.0000 (-0.041)		
Sscore				0.0001 (0.153)	
Gscore					0.0010* (1.903)
Size	-0.0198* (-1.652)	-0.0182 (-1.433)	-0.0178 (-1.408)	-0.0185 (-1.509)	-0.0216* (-1.899)
MTB	-0.0011 (-0.718)	-0.0011 (-0.740)	-0.0011 (-0.740)	-0.0011 (-0.744)	-0.0009 (-0.612)
Leverage	0.0661 (1.004)	0.0637 (0.961)	0.0632 (0.953)	0.0640 (0.974)	0.0690 (1.061)
Growth	-0.0001 (-0.177)	-0.0001 (-0.241)	-0.0001 (-0.252)	-0.0001 (-0.238)	-0.0000 (-0.009)
Liquidity	0.0048 (0.788)	0.0046 (0.760)	0.0046 (0.757)	0.0047 (0.763)	0.0054 (0.877)
R&D	-0.0834 (-0.224)	-0.0698 (-0.187)	-0.0655 (-0.174)	-0.0727 (-0.196)	-0.0852 (-0.227)
ROE	-0.0573** (-1.971)	-0.0569** (-1.968)	-0.0568* (-1.960)	-0.0570** (-1.966)	-0.0577** (-1.979)
Capex	0.3095 (1.610)	0.3067 (1.590)	0.3067 (1.587)	0.3075 (1.595)	0.3123 (1.625)
Cash	0.0637** (2.331)	0.0642** (2.359)	0.0642** (2.362)	0.0642** (2.358)	0.0609** (2.250)
Competition	0.1289*** (3.267)	0.1296*** (3.268)	0.1298*** (3.269)	0.1294*** (3.270)	0.1268*** (3.232)
Hostile	0.0932 (1.062)	0.0944 (1.091)	0.0948 (1.099)	0.0938 (1.081)	0.0994 (1.120)
Blockholder	-0.0955*** (-2.843)	-0.0962*** (-2.873)	-0.0963*** (-2.877)	-0.0960*** (-2.863)	-0.0921*** (-2.744)
Crossborder	0.0468* (1.704)	0.0477* (1.735)	0.0478* (1.741)	0.0475* (1.725)	0.0456* (1.660)
Horizontal	0.0057 (0.199)	0.0063 (0.220)	0.0064 (0.223)	0.0062 (0.215)	0.0045 (0.155)
Acqpubl	0.0431 (1.347)	0.0429 (1.348)	0.0428 (1.343)	0.0431 (1.349)	0.0406 (1.276)
Constant	-0.7184*** (-4.267)	-0.7179*** (-4.247)	-0.7188*** (-4.250)	-0.7167*** (-4.236)	-0.7502*** (-4.463)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	755	755	755	755	755
R-squared	0.250	0.249	0.249	0.249	0.253
Maximum VIF	2.54	2.59	2.53	2.46	2.25

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 5.3 Dependent variable: 4 week premium. Change of size measurement

DV = Premium4w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	-0.0002 (-0.219)				
ESscore		-0.0006 (-0.794)			
Escore			-0.0004 (-0.700)		
Sscore				-0.0005 (-0.738)	
Gscore					0.0008 (1.262)
Rsize	-0.0199 (-1.441)	-0.0199 (-1.435)	-0.0199 (-1.436)	-0.0198 (-1.439)	-0.0193 (-1.436)
MTB	-0.0057*** (-2.880)	-0.0058*** (-2.897)	-0.0057*** (-2.881)	-0.0057*** (-2.906)	-0.0055*** (-2.863)
Leverage	0.1201 (1.621)	0.1172 (1.580)	0.1185 (1.593)	0.1173 (1.582)	0.1260* (1.677)
Growth	0.0005 (1.080)	0.0005 (1.033)	0.0005 (1.049)	0.0005 (1.046)	0.0006 (1.304)
Liquidity	0.0118 (1.485)	0.0114 (1.440)	0.0116 (1.463)	0.0115 (1.455)	0.0135* (1.675)
R&D	1.0863*** (2.965)	1.1038*** (2.996)	1.0973*** (2.977)	1.1030*** (3.011)	1.0729*** (2.945)
ROE	-0.0232 (-1.198)	-0.0230 (-1.184)	-0.0231 (-1.182)	-0.0231 (-1.195)	-0.0238 (-1.258)
Capex	0.1232 (0.428)	0.1136 (0.394)	0.1205 (0.417)	0.1109 (0.386)	0.1467 (0.509)
Cash	0.0538* (1.679)	0.0531* (1.664)	0.0531* (1.668)	0.0533* (1.666)	0.0538* (1.674)
Competition	0.1639*** (3.037)	0.1663*** (3.071)	0.1650*** (3.051)	0.1666*** (3.079)	0.1583*** (2.947)
Hostile	0.1598** (2.066)	0.1680** (2.185)	0.1639** (2.146)	0.1687** (2.189)	0.1561** (1.966)
Blockholder	-0.0608 (-1.041)	-0.0608 (-1.041)	-0.0600 (-1.027)	-0.0619 (-1.060)	-0.0588 (-1.008)
Crossborder	0.0384 (1.200)	0.0383 (1.200)	0.0381 (1.193)	0.0386 (1.208)	0.0370 (1.148)
Horizontal	-0.0267 (-0.807)	-0.0260 (-0.788)	-0.0260 (-0.788)	-0.0264 (-0.796)	-0.0268 (-0.803)
Acqpubl	0.0242 (0.496)	0.0231 (0.480)	0.0233 (0.484)	0.0234 (0.482)	0.0217 (0.448)
Constant	-0.7149*** (-5.288)	-0.7007*** (-5.490)	-0.7126*** (-5.700)	-0.6969*** (-5.398)	-0.8321*** (-5.725)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	546	546	546	546	546
R-squared	0.317	0.318	0.318	0.318	0.320
Maximum VIF	1.97	1.98	1.97	1.98	1.97

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix 6: Robustness test for Model 2

### 6.1 Dependent variable: 1 day premium

DV = Premium1d	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	-0.0002 (-0.263)				
ESG x Acqpubl	0.0009 (1.339)				
ESscore		-0.0006 (-0.756)			
ESscore x Acqpubl		0.0010 (1.503)			
Escore			-0.0006 (-0.859)		
Escore x Acqpubl			0.0009 (1.354)		
Sscore				-0.0004 (-0.592)	
Sscore x Acqpubl				0.0009 (1.514)	
Gscore					0.0008 (1.230)
Gscore x Acqpubl					0.0004 (0.694)
Size	-0.0206* (-1.774)	-0.0190 (-1.564)	-0.0184 (-1.529)	-0.0195* (-1.666)	-0.0226** (-2.101)
MTB	-0.0038** (-2.025)	-0.0037** (-2.008)	-0.0038** (-2.039)	-0.0037** (-1.983)	-0.0036* (-1.950)
Leverage	0.0635 (1.018)	0.0611 (0.973)	0.0595 (0.947)	0.0620 (0.994)	0.0651 (1.053)
Growth	0.0000 (0.033)	-0.0000 (-0.029)	-0.0000 (-0.059)	-0.0000 (-0.009)	0.0001 (0.217)
Liquidity	0.0038 (0.551)	0.0035 (0.517)	0.0036 (0.521)	0.0035 (0.518)	0.0045 (0.650)
R&D	0.2335 (0.631)	0.2497 (0.674)	0.2615 (0.697)	0.2379 (0.648)	0.2405 (0.644)
ROE	-0.0242 (-0.839)	-0.0236 (-0.818)	-0.0228 (-0.788)	-0.0243 (-0.845)	-0.0251 (-0.866)
Capex	0.1461 (0.556)	0.1430 (0.544)	0.1407 (0.534)	0.1441 (0.548)	0.1439 (0.550)
Cash	0.0575** (2.246)	0.0576** (2.302)	0.0544** (2.240)	0.0586** (2.297)	0.0510** (1.994)
Competition	0.1476*** (3.897)	0.1481*** (3.897)	0.1487*** (3.910)	0.1472*** (3.882)	0.1438*** (3.823)
Hostile	-0.0187 (-0.209)	-0.0181 (-0.205)	-0.0184 (-0.210)	-0.0180 (-0.202)	-0.0105 (-0.114)
Blockholder	-0.0432 (-1.144)	-0.0434 (-1.149)	-0.0443 (-1.175)	-0.0432 (-1.144)	-0.0421 (-1.122)
Crossborder	0.0269 (0.953)	0.0277 (0.994)	0.0294 (1.056)	0.0269 (0.965)	0.0270 (0.949)
Horizontal	0.0015 (0.057)	0.0012 (0.049)	0.0041 (0.168)	0.0008 (0.031)	0.0054 (0.209)
Constant	-0.1592 (-1.083)	-0.1602 (-1.080)	-0.1635 (-1.079)	-0.1594 (-1.082)	-0.1937 (-1.296)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	869	869	869	869	869
R-squared	0.228	0.228	0.228	0.228	0.230
Maximum VIF	2.44	2.50	2.75	2.36	2.17

Robust t-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6.2 Dependent variable: 1 week premium

DV = Premium1w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	-0.0002 (-0.182)				
ESG x Acqpubl	0.0008 (1.162)				
ESscore		-0.0006 (-0.671)			
ESscore x Acqpubl		0.0010 (1.323)			
Escore			-0.0005 (-0.674)		
Escore x Acqpubl			0.0008 (1.084)		
Sscore				-0.0004 (-0.597)	
Sscore x Acqpubl				0.0009 (1.431)	
Gscore					0.0008 (1.156)
Gscore x Acqpubl					0.0004 (0.681)
Size	-0.0196 (-1.640)	-0.0181 (-1.436)	-0.0175 (-1.392)	-0.0185 (-1.522)	-0.0211* (-1.859)
MTB	-0.0010 (-0.701)	-0.0010 (-0.684)	-0.0011 (-0.722)	-0.0010 (-0.649)	-0.0009 (-0.616)
Leverage	0.0657 (0.997)	0.0630 (0.952)	0.0609 (0.919)	0.0645 (0.982)	0.0678 (1.041)
Growth	-0.0000 (-0.135)	-0.0001 (-0.205)	-0.0001 (-0.237)	-0.0001 (-0.181)	0.0000 (0.031)
Liquidity	0.0048 (0.780)	0.0045 (0.738)	0.0045 (0.742)	0.0045 (0.741)	0.0055 (0.889)
R&D	-0.0964 (-0.259)	-0.0854 (-0.230)	-0.0749 (-0.200)	-0.0919 (-0.249)	-0.0902 (-0.241)
ROE	-0.0573** (-1.983)	-0.0568** (-1.980)	-0.0565** (-1.964)	-0.0574** (-1.996)	-0.0580** (-1.998)
Capex	0.3052 (1.586)	0.3003 (1.557)	0.2964 (1.531)	0.3040 (1.579)	0.3074 (1.592)
Cash	0.0584** (2.230)	0.0592** (2.292)	0.0556** (2.216)	0.0608** (2.315)	0.0527** (2.053)
Competition	0.1283*** (3.247)	0.1291*** (3.249)	0.1293*** (3.248)	0.1282*** (3.237)	0.1257*** (3.204)
Hostile	0.0878 (1.014)	0.0882 (1.042)	0.0880 (1.044)	0.0887 (1.037)	0.0956 (1.079)
Blockholder	-0.0962*** (-2.855)	-0.0962*** (-2.842)	-0.0972*** (-2.869)	-0.0962*** (-2.851)	-0.0943*** (-2.824)
Crossborder	0.0484* (1.757)	0.0495* (1.818)	0.0513* (1.897)	0.0484* (1.771)	0.0482* (1.729)
Horizontal	0.0101 (0.383)	0.0099 (0.383)	0.0131 (0.515)	0.0087 (0.336)	0.0122 (0.460)
Constant	-0.6921*** (-4.095)	-0.6948*** (-4.116)	-0.6961*** (-4.128)	-0.6908*** (-4.070)	-0.7244*** (-4.281)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	755	755	755	755	755
R-squared	0.249	0.249	0.248	0.249	0.252
Maximum VIF	2.54	2.59	2.86	2.46	2.25

Robust t-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 6.3 Dependent variable: 4 week premium. Change of size measurement

DV = Premium4w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESG	-0.0010 (-0.574)				
ESG x Acqpubl	0.0008 (0.577)				
ESscore		-0.0017 (-0.909)			
ESscore x Acqpubl		0.0012 (0.693)			
Escore			-0.0021 (-1.100)		
Escore x Acqpubl			0.0018 (0.986)		
Sscore				-0.0011 (-0.710)	
Sscore x Acqpubl				0.0005 (0.401)	
Gscore					0.0007 (0.734)
Gscore x Acqpubl					0.0002 (0.198)
Rsize	0.0005 (1.576)	0.0005 (1.579)	0.0005 (1.590)	0.0005 (1.595)	0.0005* (1.657)
MTB	-0.0057*** (-3.071)	-0.0057*** (-3.064)	-0.0057*** (-3.027)	-0.0058*** (-3.103)	-0.0056*** (-3.078)
Leverage	0.1203 (1.613)	0.1173 (1.574)	0.1189 (1.593)	0.1179 (1.582)	0.1279* (1.698)
Growth	0.0006 (1.296)	0.0006 (1.252)	0.0006 (1.303)	0.0006 (1.252)	0.0007 (1.533)
Liquidity	0.0098 (1.220)	0.0093 (1.155)	0.0093 (1.165)	0.0094 (1.177)	0.0116 (1.421)
R&D	1.0581*** (2.890)	1.0725*** (2.916)	1.0608*** (2.876)	1.0785*** (2.949)	1.0493*** (2.884)
ROE	-0.0211 (-1.099)	-0.0209 (-1.079)	-0.0206 (-1.067)	-0.0214 (-1.111)	-0.0223 (-1.192)
Capex	0.0851 (0.303)	0.0773 (0.275)	0.0842 (0.299)	0.0703 (0.251)	0.1038 (0.369)
Cash	0.0511 (1.609)	0.0516 (1.636)	0.0527* (1.717)	0.0494 (1.551)	0.0478 (1.546)
Competition	0.1525*** (2.936)	0.1538*** (2.971)	0.1522*** (2.953)	0.1547*** (2.979)	0.1466*** (2.818)
Hostile	0.1509** (2.160)	0.1594** (2.280)	0.1497** (2.145)	0.1595** (2.267)	0.1434** (1.988)
Blockholder	-0.0596 (-1.019)	-0.0603 (-1.031)	-0.0604 (-1.036)	-0.0605 (-1.034)	-0.0566 (-0.969)
Crossborder	0.0338 (1.044)	0.0339 (1.054)	0.0343 (1.069)	0.0339 (1.053)	0.0323 (0.989)
Horizontal	-0.0236 (-0.734)	-0.0235 (-0.735)	-0.0240 (-0.753)	-0.0228 (-0.708)	-0.0224 (-0.692)
Constant	-0.6911*** (-3.641)	-0.6789*** (-5.249)	-0.6931*** (-5.667)	-0.6827*** (-5.176)	-0.7974*** (-4.206)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	546	546	546	546	546
R-squared	0.322	0.324	0.325	0.323	0.324
Maximum VIF	4.38	5.72	9.00	4.39	4.83

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix 7: Robustness test for Model 3

### 7.1 Dependent variable: 1 day premium

DV = Premium1d	ESGGAP (1)	ESGAP (2)	EGAP (3)	SGAP (4)	Ggap (5)
ESGgap	-0.0006 (-0.762)				
ESgap		-0.0012 (-1.547)			
Egap			-0.0013** (-2.088)		
Sgap				-0.0004 (-0.606)	
Ggap					0.0006 (0.907)
Size	-0.0118 (-0.650)	-0.0105 (-0.590)	-0.0094 (-0.534)	-0.0121 (-0.662)	-0.0125 (-0.671)
MTB	-0.0037** (-2.261)	-0.0037** (-2.274)	-0.0036** (-2.256)	-0.0037** (-2.268)	-0.0036** (-2.272)
Leverage	0.1552 (1.269)	0.1526 (1.284)	0.1537 (1.315)	0.1527 (1.251)	0.1490 (1.199)
Growth	0.0005 (0.795)	0.0005 (0.811)	0.0005 (0.764)	0.0005 (0.819)	0.0005 (0.832)
Liquidity	0.0104 (1.347)	0.0097 (1.264)	0.0094 (1.235)	0.0107 (1.386)	0.0117 (1.499)
R&D	0.2690 (0.531)	0.2711 (0.544)	0.2797 (0.572)	0.2547 (0.500)	0.2175 (0.418)
ROE	-0.0076 (-0.474)	-0.0075 (-0.476)	-0.0075 (-0.495)	-0.0077 (-0.476)	-0.0083 (-0.515)
Capex	0.0866 (0.274)	0.0729 (0.230)	0.0774 (0.246)	0.0945 (0.300)	0.1383 (0.439)
Cash	0.0624 (1.404)	0.0535 (1.187)	0.0509 (1.136)	0.0642 (1.447)	0.0730* (1.700)
Competition	0.1841*** (2.628)	0.1888*** (2.671)	0.1915*** (2.708)	0.1828*** (2.626)	0.1756** (2.542)
Hostile	-0.0375 (-0.252)	0.0014 (0.009)	-0.0090 (-0.056)	-0.0361 (-0.244)	-0.0677 (-0.495)
Blockholder	-0.0243 (-0.307)	-0.0247 (-0.312)	-0.0261 (-0.329)	-0.0241 (-0.305)	-0.0229 (-0.292)
Crossborder	0.0518 (1.198)	0.0442 (1.054)	0.0395 (0.954)	0.0523 (1.205)	0.0539 (1.209)
Horizontal	-0.0575 (-1.009)	-0.0596 (-1.042)	-0.0587 (-1.030)	-0.0561 (-0.977)	-0.0481 (-0.853)
Acqpubl	-0.1501 (-0.821)	-0.1647 (-0.876)	-0.1694 (-0.885)	-0.1449 (-0.797)	-0.1227 (-0.692)
Constant	0.3404 (1.256)	0.3396 (1.244)	0.3260 (1.179)	0.3408 (1.262)	0.3186 (1.198)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	339	339	339	339	339
R-squared	0.331	0.336	0.342	0.330	0.331
Maximum VIF	2.61	2.62	2.62	2.61	2.60

Robust t-statistics in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 7.2 Dependent variable: 1 week premium

DV = Premium1w	ESGGAP (1)	ESGAP (2)	EGAP (3)	SGAP (4)	Ggap (5)
ESGgap	-0.0007 (-0.793)				
ESgap		-0.0011 (-1.428)			
Egap			-0.0012* (-1.852)		
Sgap				-0.0005 (-0.671)	
Ggap					0.0004 (0.805)
Size	-0.0205 (-1.095)	-0.0193 (-1.057)	-0.0185 (-1.018)	-0.0206 (-1.100)	-0.0209 (-1.097)
MTB	-0.0014* (-1.830)	-0.0014* (-1.909)	-0.0014* (-1.851)	-0.0014* (-1.846)	-0.0013* (-1.723)
Leverage	0.2479* (1.921)	0.2471* (1.963)	0.2502** (2.009)	0.2446* (1.894)	0.2409* (1.832)
Growth	0.0001 (0.234)	0.0001 (0.244)	0.0001 (0.217)	0.0001 (0.236)	0.0001 (0.188)
Liquidity	0.0151** (2.050)	0.0145** (2.004)	0.0141** (1.977)	0.0154** (2.088)	0.0164** (2.158)
R&D	-0.0338 (-0.064)	-0.0364 (-0.069)	-0.0140 (-0.027)	-0.0529 (-0.099)	-0.0722 (-0.133)
ROE	-0.0319*** (-2.672)	-0.0311*** (-2.644)	-0.0306** (-2.545)	-0.0319*** (-2.685)	-0.0323*** (-2.602)
Capex	0.2867 (0.916)	0.2803 (0.894)	0.2825 (0.906)	0.2976 (0.954)	0.3426 (1.098)
Cash	0.0949** (2.028)	0.0879* (1.843)	0.0861* (1.813)	0.0962** (2.067)	0.1044** (2.366)
Competition	0.1910** (2.474)	0.1955** (2.474)	0.1971** (2.493)	0.1896** (2.463)	0.1811** (2.435)
Hostile	-0.0578 (-0.359)	-0.0153 (-0.095)	-0.0135 (-0.085)	-0.0594 (-0.377)	-0.0976 (-0.643)
Blockholder	-0.0882 (-1.603)	-0.0891 (-1.632)	-0.0907* (-1.680)	-0.0875 (-1.579)	-0.0853 (-1.546)
Crossborder	0.0489 (1.074)	0.0423 (0.947)	0.0387 (0.875)	0.0492 (1.076)	0.0520 (1.120)
Horizontal	-0.0752 (-1.302)	-0.0767 (-1.315)	-0.0760 (-1.300)	-0.0739 (-1.266)	-0.0667 (-1.168)
Acqpubl	-0.0843 (-0.864)	-0.0983 (-0.997)	-0.1035 (-1.034)	-0.0799 (-0.829)	-0.0601 (-0.619)
Constant	0.4186** (2.090)	0.4214** (2.109)	0.3166 (1.421)	0.4161** (2.072)	0.4453** (2.207)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	295	295	295	295	295
R-squared	0.418	0.423	0.428	0.417	0.418
Maximum VIF	2.82	2.83	2.84	2.82	2.82

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 7.3 Dependent variable: 4 week premium. Change of size measurement

DV = Premium4w	ESG (1)	Environmental & social (2)	Environmental (3)	Social (4)	Governance (5)
ESGgap	-0.0002 (-0.162)				
ESgap		-0.0010 (-1.220)			
Egap			-0.0012* (-1.752)		
Sgap				-0.0002 (-0.310)	
Ggap					0.0011 (1.459)
Rsize	-0.0671* (-1.913)	-0.0559 (-1.624)	-0.0501 (-1.475)	-0.0662* (-1.922)	-0.0718** (-2.077)
MTB	-0.0048** (-2.498)	-0.0049** (-2.465)	-0.0048** (-2.417)	-0.0048** (-2.502)	-0.0047** (-2.539)
Leverage	0.1764 (1.531)	0.1754 (1.571)	0.1767 (1.608)	0.1756 (1.536)	0.1680 (1.444)
Growth	0.0008 (1.065)	0.0008 (1.076)	0.0007 (1.043)	0.0008 (1.074)	0.0008 (1.120)
Liquidity	0.0114 (1.452)	0.0105 (1.335)	0.0102 (1.293)	0.0114 (1.455)	0.0125 (1.552)
R&D	0.5940 (1.132)	0.6111 (1.184)	0.6203 (1.219)	0.5927 (1.135)	0.5256 (0.983)
ROE	-0.0158 (-1.075)	-0.0154 (-1.044)	-0.0153 (-1.049)	-0.0158 (-1.071)	-0.0169 (-1.151)
Capex	-0.2453 (-0.712)	-0.2660 (-0.771)	-0.2618 (-0.758)	-0.2480 (-0.724)	-0.1934 (-0.560)
Cash	0.0486 (1.013)	0.0404 (0.839)	0.0389 (0.814)	0.0477 (0.988)	0.0546 (1.152)
Competition	0.2208** (2.411)	0.2288** (2.471)	0.2330** (2.523)	0.2213** (2.420)	0.2105** (2.295)
Hostile	-0.0795 (-0.556)	-0.0306 (-0.200)	-0.0373 (-0.239)	-0.0699 (-0.481)	-0.0869 (-0.671)
Blockholder	-0.0771 (-0.907)	-0.0752 (-0.883)	-0.0752 (-0.878)	-0.0768 (-0.904)	-0.0748 (-0.893)
Crossborder	-0.0004 (-0.008)	-0.0085 (-0.193)	-0.0135 (-0.308)	-0.0010 (-0.023)	-0.0018 (-0.040)
Horizontal	-0.0430 (-0.725)	-0.0468 (-0.795)	-0.0461 (-0.792)	-0.0435 (-0.731)	-0.0323 (-0.555)
Acqpubl	-0.0749 (-0.400)	-0.0879 (-0.456)	-0.0888 (-0.454)	-0.0762 (-0.406)	-0.0520 (-0.284)
Constant	0.0946 (0.305)	0.0951 (0.300)	0.0993 (0.308)	0.0913 (0.295)	0.0161 (0.052)
Year, industry & country effect	Yes	Yes	Yes	Yes	Yes
Observations	338	338	338	338	338
R-squared	0.332	0.336	0.341	0.332	0.339
Maximum VIF	2.30	2.29	2.29	2.29	2.30

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1