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ESG - Does it Pay in M&A?

Investigating the ESG premium in Mergers and Acquisitions

Thuan Alexander Ung & Mads Nymoen Urfe

Supervisor: José Albuquerque de Sousa

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Mads Nymoen Urfe

Thuan Alexander Ung

Abstract

Using a sample of 762 international M&As, we find a positive effect of ESG performance on deal premia. We find that resource use, human rights, and management are the most important categories of ESG. These aspects might be more quantifiable and relevant, making them easier to value in a transaction and more attractive to the acquirer. Targets receive higher premiums from raising their resource use score by one standard deviation, compared to raising the total ESG score by one standard deviation, suggesting that targets are better off focusing on this category for raising premiums.

Furthermore, we find that the effect of ESG performance on deal premiums diminishes when the target is in the upper tercile of analyst following and in deals with share payments. This finding supports extant research in that ESG reduces information asymmetries and facilitates risk mitigation. Since we find a positive relationship between premia and ESG scores, we argue that ESG initiatives are valuable. ESG affects synergies, information asymmetries, and risk mitigation, supporting the stakeholder view of ESG in that ESG is valuable. Our results are largely robust to correcting for potential endogeneity issues and other robustness tests.

We also find that targets and acquirers improve their score by about five and seven points, respectively, when merging with a higher-scored firm. Such a substantial score improvement suggests that the transfer of ESG-related capabilities such as knowledge, culture, reputation, and relationships with stakeholders is possible, as previous literature suggests. This finding leads us to argue that merging to attain better ESG performance might potentially be a contributing motive for M&A itself.

Keywords – Mergers & Acquisitions, Deal Premium, ESG, Environmental, Social, Governance, LaTeX

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1 Introduction

This thesis will investigate environmental, social, and governance ("ESG") scores of targets' and acquirers' effect on mergers & acquisitions ("M&A") deal premiums. We gather transactions from the last 15 years since data on ESG scores have become widely available recently. Matching ESG-score to the deal announcement year yields a sample of 766 transactions. We will first employ multiple regression to explore the effect of ESG score on deal premiums.

To better understand which specific aspects of ESG influence premia, we run the same regression models on category scores, which are ten categories that combined make up the total score. Additionally, we explore whether contexts where information asymmetry or risk mitigation is more or less prevalent enhance or diminish the effect of ESG on premiums, based on theoretical mechanisms identified in the literature review. These aspects are scarcely researched: Extant work focuses mainly on the overall score, finding a positive effect on premia. Then, we will investigate whether the ESG score of the transaction parties improves from before the merger to after it. To our knowledge, such research has not been done before.

Since entering into M&As and receiving an ESG score are non-random events, the risk of a selection bias and other biases induced by omitted variables is present. We address these endogeneity concerns by employing a two-stage Heckman correction model and instrumental variable regression.

We research M&A deal premiums specifically as this offers some key advantages: First, potential bidders perform due diligence, making them more informed about intrinsic value than the market. Secondly, they better understand intangible assets, specifically those related to ESG in our context. Thus, acquirers are more likely to value ESG performance and -synergies correctly than marginal investors. Additionally, scoring firms based on their ESG initiatives quantifies a largely qualitative aspect of a firm. Combining these points allows us to research whether acquirers value good ESG performance.

M&A bidders are more concerned about the target's specific risks because of investment concentration and costs of potential divestiture. Good ESG performance may alleviate this risk since good relationships with stakeholders build goodwill, reducing the negative

consequences of cash-flow shocks (Godfrey et al., 2009). Theoretically, this should increase the importance acquirers place on ESG in the context of M&A, at least when we factor in that ESG might also reduce information asymmetries. Extant research discuss these advantages of ESG, but our thesis seeks to investigate them empirically.

We also attempt to introduce more standardized measures of ESG performance since much of extant research employs proxies for such performance (Godfrey et al., 2009). Hence, our approach is more replicable and transferable to specific regions, different periods, and the like.

Our thesis is structured as follows: First, we review the literature on ESG and value, M&A and ESG performance, and factors affecting deal premiums and ESG. Drawing from this, we formulate our hypotheses in the following section. Then, we describe our data and sample collection process. After, we describe all the variables' implementation before outlining our methodology. We present our findings in the results section before exploring the robustness behind them and the limitations of our research. Lastly, we conclude based on our original hypotheses, findings, and discussion.

2 Literature Review

In this section, we first review the relationship between ESG and value. Next, we discuss ESG performance in light of M&As and the motives behind them, as these motives broadly cover the sources of deal premia. From this, we discuss benefits of increased ESG performance - reduced information asymmetries and risk mitigation - in greater detail. The third section builds upon the first two: It outlines which factors impact premiums and ESG performance. Most studies find a positive relationship between CSR[1] and deal premia (Choi et al., 2015; Gomes & Marsat, 2018; Malik, 2014).

2.1 ESG and Value

The shareholder expense view put forth by Friedman (2007) argues that firms' only social responsibility should be their shareholders. Thus, firms should maximize profits and shareholder value. According to this view, the costs of ESG initiatives, which benefit stakeholders and society, do not translate into better financial performance. The stakeholder view takes the opposite stance, arguing that good ESG performance and profit are not mutually exclusive (Freeman, 2010; Porter & Kramer, 2006). ESG initiatives may create a competitive advantage, which can raise profits. Such competitive advantages include reputation, culture, and knowledge, which we refer to as ESG capabilities. For example, a good reputation might increase a firm's customer base, providing the firm with increased sales. As such, the two views reach opposite conclusions regarding the valuation of ESG. Attempts to empirically investigate which one prevails have not reached a consensus[2]. The main reason is because of the intangible nature of ESG initiatives, making them hard to value[3] (Gomes & Marsat, 2018). Theoretically, such intangible assets are valuable if they are a source of competitive advantage, following the resource-based view of the firm (Wernerfelt, 1984).

[1]Extant work focuses mainly on CSR, as opposed to ESG. However, since CSR is often calculated using the environmental and social scores or similar, the findings should be relevant in our context as well.

[2]See e.g., Servaes and Tamayo (2013); Gregory et al. (2014); Aouadi and Marsat (2016).

[3]The context of M&As potentially makes these valuations more accurate, which is why we research them specifically.

2.2 M&A and ESG Performance

Two of the most prevalent motives for M&A in the literature are the synergy hypothesis and the market for corporate control hypothesis. In this section, we detail the motives before explaining how they relate to ESG. The theoretical effect of ESG on premia is ambiguous, although many of the papers reviewed find a positive link.

The synergy hypothesis states that managers capture value for shareholders through different synergies (Malik, 2014; Lubatkin, 1987; Capron & Pistre, 2002). The literature identifies synergies associated with efficiency-related gains such as economies of vertical integration, scope and scale, and financial gains, e.g., diversification and product market synergies (Motis, 2007). These expected synergies should be reflected in the acquisition premium (Díaz et al., 2013).

Synergies might be enhanced or created from good ESG performance. An example of this is if a company prioritizes innovation, creating new products, services, production methods, or exposure to new markets[4]. This capability should be valuable to acquirers, which would then pay a higher premium for such firms. Moreover, compatibility of views on cultural, ethical, and governance-related matters are material determinants of successful synergy realization and integration (Ficery et al., 2007; Appelbaum, 2009). Therefore, ESG may be an indicator of compatibility between the target and the acquirer (Deng et al., 2013), increasing the likelihood of realizing synergies.

Supporting the previous argument, Aktas et al. (2011) find that more synergistic deals occur with targets that exhibit better CSR performance. In addition, if acquirers can transfer CSR capabilities to the target or vice versa, synergies may be created from this transfer. Indeed, Aktas et al. also uncover that the CSR performance of an acquirer increases after acquiring an SRI (socially responsible investment) aware target. Malik (2014) also finds these learning effects, in which the effect of the target's CSR score on deal premiums was higher in deals involving high-CSR acquirers. She highlights the greater value-enhancing and synergistic capabilities of targets with superior CSR quality as reasons for the positive effect. Thus, good ESG performance might enhance or create synergies in M&As, positively impacting the deal premium.

[4]Innovation and product responsibility are categories within the total ESG score.

Next, the disciplinary effect of the equity market on underperforming managers is referred to as the market for corporate control hypothesis (Manne, 1965). The hypothesis states that inefficient management manifests in the stock price of the company. Potential acquirers can detect this, acquire the company and replace the management. Therefore, managers who either act outside the best interest of shareholders or are incompetent gets replaced, increasing the target's value (Jensen & Ruback, 1983). Relating this to premia, this is the value of control or control premium, i.e., the gain from managing the target more efficiently (Damodaran, 2005). Thus, following the market for corporate control hypothesis, we expect the deal premium to be higher when the target has poor management.

Since this hypothesis concerns management and governance mechanisms, it should be related to ESG since ESG explicitly measures governance performance. Indeed, one of the components of the governance score is management. The hypothesis then suggests that firms with low management scores should be more frequently acquired and receive higher premia. In addition, if social and environmental responsibility is unachievable without destroying shareholder value[5], high ESG performers should be more frequent takeover targets due to inefficient management, according to the hypothesis (Manne, 1965). The deal premium should then be higher for these firms because of the value of control. On the other hand, competent managers may be a valuable asset to acquirers according to the stakeholder view, so the relationship between ESG performance and the hypothesis is ambiguous.

2.2.1 Asymmetric Information

In MAs, there will exist some form of asymmetric information between the parties of a merger because it is hard for acquirers to observe all aspects of their potential targets. There is incomplete information since the seller has more comprehensive knowledge of his firm. Thus, asymmetric information is closely related to premiums because the intrinsic value is harder to observe when information is scarce. Roychowdhury et al. (2019) find that disclosure might resolve information asymmetries, mitigating adverse selection.

Regarding adverse selection, potential bidders may find that acquiring information about

[5]Consistent with the shareholder expense view.

targets is too costly, making it challenging to determine their quality. Likewise, targets have the incentive to misrepresent their quality to obtain higher premiums (Reuer & Ragozzino, 2008). These consequences can lead to the abandonment of potential deals, discounted offer prices, and the risk of adverse selection borne by the bidder. Thus, acquirers will have incentives to treat all potential targets as bad[6]. Therefore, the risk of adverse selection will most likely impact premia since the bidder is less informed on the actual quality of the target. Because of this, good targets have an incentive to disclose more to signal their overall quality.

ESG reporting might reduce some of this information asymmetry through transparency about ESG initiatives (Ioannou & Serafeim, 2012). As ESG scores incorporate both performance and disclosure related to ESG, a higher score may be related to higher premiums. A positive relationship between CSR and acquisition premiums may be attributed to the acquirer valuing CSR involvement in itself, as well as reduced information asymmetries (Gomes & Marsat, 2018). Specifically, CSR reduces asymmetries and adverse selection since CSR performance signals the overall quality of the target, along with cultural and ethical values (Choi et al., 2015). In an environment with adverse selection, it is intuitive that such signaling increases premia.

In addition, the effect of CSR on acquisition premiums may be even more prevalent in low-information environments (Choi et al., 2015), such as during cross-border M&As. In these deals, the information asymmetry is usually more significant due to, e.g., differing disclosure requirements, regulation, and culture (Gomes & Marsat, 2018). These findings emphasize that ESG may be an important determinant of deal premiums by reducing information asymmetry and adverse selection.

On the other hand, the degree of information asymmetry is related to the risk of overpayment (Datar et al., 2001). Then, due to the multifarious nature of ESG scores[7], and if both high- and low-quality targets are inclined to disclose ESG information, the effect is ambiguous. For example, acquirers can better uncover negative ESG-related behaviors of the firm, e.g., poor working conditions, which contradict the stakeholder view of ESG, in this case lowering the premium. Chen & Gavious (2015) argue that acquirers have a superior ability to gain information rather than marginal investors, for example,

[6]I.e., the *lemons problem*, proposed by Akerlof (1978).

[7]As in incorporating both ESG performance as well as disclosure into scores.

private individuals. Further, they assert that acquirers do not view ESG as having a real profit potential for the firm because it does not reveal additional information.

2.2.2 Risk Mitigation

ESG activities may act as insurance: Godfrey et al. (2009) find that CSR engagement benefits the firm in the case of a negative shock, where the loss of value on average was less severe for firms with good CSR performance. The insurance effect results from the goodwill created from CSR initiatives directed towards stakeholders, essentially allowing the firm to mitigate its risk through good relationships.

Consistent with the stakeholder view, CSR may function as a reputational asset that indirectly represents the target firm's relationship with its stakeholders (Choi et al., 2015). Thus, acquirers may associate CSR performance with lower specific risk. CSR engagement also lowers the probability of reputational and litigation risks resulting from social and environmental issues, such as human rights violations or emission scandals, which acquirers may value more than marginal investors because of investment concentration: As the cost of liquidation and risk reduction is higher for acquirers (Malik, 2014), acquirers should positively value these risk-mitigating effects of ESG, leading to higher premia.

To sum up, the factors discussed should, in theory, influence premiums. While the impact of ESG on premia is ambiguous[8], most of the papers reviewed find a positive effect. Any misvaluation of ESG activities may stem from a lack of understanding of the consequences of such initiatives (Malik, 2014). If market participants undervalue firms with high ESG scores, we may see a positive effect of ESG on premiums through its effect on risk management, information asymmetries, and synergies. However, whether this stems from good ESG performance directly or the increased level of disclosure good ESG scores imply is not certain.

2.3 Factors Affecting Premiums and ESG

This section will detail factors affecting premia that might theoretically be linked to ESG and deal premiums, warranting their inclusion as control variables. Table A1 in the appendix synthesizes the expected sign of each variable, along with the applicable motive

[8]Which is why empirical research is warranted.

for M&A or proxy. We discuss variables relating to synergies, information asymmetries, or risk mitigation separately, drawing on the discussion above to establish a relationship with ESG.

We first discuss synergies. Size proxies for the effect of increased complexity, potentially making synergies harder to realize (Alexandridis et al., 2013). Complexity is also related to information asymmetries, making size related to ESG. Further, industry-related deals are associated with lower information asymmetries because the market knowledge of the acquirer is relatively better (Gomes & Marsat, 2018). In these deals synergies may be easier to realize (Mercer, 1999; Shelton, 1988), making the effect on premia and ESG ambiguous. Regarding capital expenditures, Gomes & Marsat find that these influence synergies; for example, higher capex might increase the potential for cost-cutting by removing duplicate investments.

Targets with low growth might be desirable because of realizable gains if current management gets replaced (Dionne et al., 2015), consistent with the market for corporate control hypothesis. Thus, potential gains are larger when management performs poorly (Manne, 1965), and ESG might enhance the effect (Aktas et al., 2011), as discussed above.

Considering information asymmetries, cross-border deals are associated with increased asymmetries arising from cultural differences, accounting standards, and regulation (Gatignon & Anderson, 1988). However, shareholder gains from cultural input may increase to the benefit of both parties (Danbolt & Maciver, 2012). Thus, the link to ESG is evident, while the effect on premia is ambiguous. Furthermore, competition is more likely when information about the target is accessible (Jennings & Mazzeo, 1993). Thus, it is linked with ESG, and most research finds a positive relationship with premia (Varaiya, 1987; Fidrmuc, 2013). From Jennings & Mazzeo (1993), we infer that hostile deals have a higher availability of information[9], implying that information asymmetries are less prevalent or severe in hostile deals. Thus, ESG performance might matter less in hostile takeovers. Most scholars find a positive effect on premia (Burch, 2001; Bates & Lemmon, 2003).

Blockholds proxy for reduced information asymmetries (Dionne et al., 2015) since acquirers

[9]Since they find that hostile deals correlate with competition, and competition correlates with availability of information.

can observe and monitor the target. Monitoring also allows them to mitigate mispricing risk, which reduces premiums (Walkling & Edmister, 1985). Martin (1996) also mentions that blockholders can roll back antitakeover defenses, relating blockholds to governance. Thus, blockholds may diminish the effect of ESG on premia. Next, financial analysts perform due diligence on firms, potentially uncovering more information, reducing asymmetries. These analysts are more accurate when firms disclose more ESG-related information (Cormier & Magnan, 2014).

Lastly, we will discuss risk mitigation. Cash payments are associated with higher confidence in post-merger success relative to share payments (Linn & Switzer, 2001), which may positively affect premiums (de La Bruslerie, 2013). Taxes are deferred in stock-financed transactions[10], potentially creating an advantageous effect compared to cash financing (Ayers et al., 2003). Hansen (1987) introduced risk-sharing, reflecting the relationship between payment methods and the double informational asymmetries between the parties. Share payments are also associated with risk-sharing since the target receives shares instead of risk-free cash, raising premiums. When receiving shares in the merged firm, the seller's payoff is conditional on its performance and successful integration. Additionally, the choice of payment might signal whether acquirers perceive their shares as over- or undervalued (Faccio & Masulis, 2005). Since the choice of payment method reflects both risk mitigation and asymmetric information, its link with ESG is clear.

The market to book ratio reflects a firm's future growth potential (Martin, 1996) and proxies for misvaluation (Dong et al., 2006). Both these effects align the ratio with risk, but the effect on premia is ambiguous (Officer, 2003; Walkling & Edmister, 1985). Further, the ratio reflects managerial discipline and discretion since it measures managers' ability to create value from existing assets. Extant research promoting the stakeholder view has pointed out how a firm's ESG initiatives can be viewed as intangible assets because they can create value, creating a theoretical link between them. Next, a highly levered target is considered less attractive[11] and may receive lower premiums (Dionne et al., 2015). With highly levered targets, the acquirer is relatively more likely to pay using shares to limit the effect on its leverage. Because of the risk-sharing effects of share financing (Hansen, 1987) and because stricter monitoring by debtors might reveal more information (de La

[10]Depending on the country of domicile.

[11]E.g., because of higher interest rates and more constrained financing options.

Bruslerie, 2013), leverage is potentially related to ESG. This research also finds that leverage affects premia negatively.

Since these aforementioned characteristics vary over time and for different industries (Martynova & Renneboog, 2008; Mitchell & Mulherin, 1996), they might affect premia differently (Bennett & Dam, 2017). Thus, controlling for time- and industry fixed effects is also relevant in our study.

3 Hypotheses

3.1 Hypothesis 1: ESG-score Affects M&A premiums positively.

From the review in the previous section, we gather that relevant literature mainly focuses on CSR but still finds a significantly positive relationship with premiums. However, according to the literature discussed earlier, the relationship is ambiguous, clearly justifying further empirical research. Thus, our first hypothesis is that ESG-scores affect deal premiums positively because of its effect on information asymmetries, risk mitigation, and synergies (Gomes & Marsat, 2018; Malik, 2014; Aktas et al., 2011).

When inspecting the categories within each pillar that combined make up the ESG score, multiple aspects might affect premiums either positively or negatively. For example, a relatively low emission target might command higher premiums; and a target with a high workforce score might have more efficient and motivated workers, raising premiums.

We will investigate the main results further by disaggregating the combined score, looking at individual category scores. The latter is particularly interesting since extant research has made few efforts to investigate this, despite citing it as an exciting avenue for future research[12].

3.2 Hypothesis 2a: The effect of ESG on premia is stronger in context with higher asymmetric information and vice versa.

Through our discussion in the literature review, we have established theoretical connections between ESG and asymmetric information. To better investigate how and why ESG impacts deal premiums, we examine the effect in different informational contexts. We hypothesize that ESG is more important in contexts where information asymmetry is higher, and vice versa, as suggested by extant literature (e.g., Choi et al., 2015; Gomes & Marsat, 2018). The rationale is that when information asymmetry is low, marginal reductions in information asymmetry from ESG should be less valuable, and vice versa.

To investigate this hypothesis, we look at whether the effect of the target's ESG score is higher in cross-border deals (i.e., deals with higher levels of information asymmetry),

[12]See e.g. Gomes & Marsat (2018)

same-industry deals, and deals where the target is highly followed by analysts (deals with lower levels of asymmetry).

3.3 Hypothesis 2b: The effect of ESG on premia is lower in deals with share payments.

In this hypothesis, we investigate whether the ESG effect on premia is lower when the acquirer uses share payments, as the payment method may reveal details about the perceived risk and confidence in the deal (Linn & Switzer, 2001; Officer et al., 2009). The payment method also relates to risk-sharing – in share payments, acquirers transfer some of their risk to the target. Thus, share payments may mitigate adverse selection - if targets know that their assets are of high value, they can also anticipate that their holdings in the merged enterprise will increase, making them more likely to accept share payments (Hansen, 1987). Risk-sharing is relevant due to the risk-mitigating properties of CSR engagement (Godfrey et al., 2009) and CSR as a reputational asset (Choi et al., 2015). Therefore, we hypothesize that the effect of the target's score on premia is reduced when risk-mitigation efforts are made through share payments.

3.4 Hypothesis 3: Deal participants improve their ESG score post-acquisition if merging with a higher-scored firm.

Our third hypothesis is based on the synergy hypothesis and how it relates to ESG. We examine if synergies can be created by transferring ESG capabilities from target to acquirer, or vice versa. If so, we should notice an increase in score from the announcement year to post-acquisition. If the previous point holds, merging to attain better ESG capabilities can be viewed as a motive for M&A itself.

This point is supported by Berchicci et al. (2012), who find that acquirers with poor CSR performance acquiring targets with high CSR performance can distribute these capabilities and benefits to themselves. Aktas et al. (2011) attribute this to a "learning effect," i.e., the acquirer learning from its target. Given the opposite case, where the acquirer has a high score and the target has a low score, an acquirer might purposefully look for targets that can benefit the most from the transfer of ESG capabilities (Berchicci et al. 2012). As such, we can also investigate whether targets purchased by firms with

high ESG performance improve more than their peers.

We will investigate whether targets or acquirers improve their score relatively more when merging with an acquirer or target with a higher score than deals with a smaller score differential. We hypothesize that the deal participants improve their score more when the differential is larger.

4 Data and Sample Construction

We collect ESG scores and financial data from Refinitiv Eikon, while the M&A data is from the Thomson Reuters Securities Data Company Platinum database ("SDC") available within Refinitiv Eikon. We will first describe the SDC database, our choice of ESG data provider, and ESG scores in greater detail before describing the sample collection and creation process.

4.1 Thomson Reuters SDC Platinum

The SDC Platinum database contains 1.1 million M&As since the 1970s. It allows users to filter the M&A universe based on a range of criteria, such as year, country, size, industry, deal status, and deal type, to mention a few. These filters apply to targets, acquirers, or the deal.

In addition, it allows users to add more information to the individual deal by including additional variables. These might relate to the specific deal, such as whether the deal was hostile or how the acquirer financed it. Users may also include other types of variables such as financial metrics and ratios. Applying these filters and attaching additional information yields a custom sample of M&As, which can then be analyzed further.

4.2 Choice of ESG data provider

Scoring is ambiguous: Chatterji et al. (2009) find that scores inaccurately reflect the actual level of compliance and public information available. This misrepresentation implies that measuring the qualitative aspect of ESG initiatives leaves substantial room for error. An advantage of using scores from Refinitiv is that they address this issue by scoring firms based on their peers instead of using an absolute score.

Studying the three major ESG score providers[13], Dorfleitner et al. (2015) find no convergence in scoring. This finding further illustrates the point above since providers arrive at different results for the same firms. The providers have proprietary scoring methodologies, which might explain some differences. These also decrease transparency and make it hard to assess whether scores reflect reality or not. We use data from Refinitiv

[13]Refinitiv, Bloomberg, and MSCI.

as their current and historical coverage is more extensive than most other providers. Expanded coverage allows us to maximize our final sample size and minimize the influence of ambiguous scoring.

4.3 Refinitiv ESG scores

Refinitiv's ESG scores cover 70% of global market capitalization, with data dating back to 2002. Scores account for company size and transparency since firms are scored based on rank. Refinitiv retrieves its data from annual reports, company websites, NGO websites, stock exchange filings, CSR reports, and news sources (Refinitiv, 2021).

4.3.1 Scoring Methodology

Each of the three pillars is broken down further into categories. For the environmental and social pillars, scoring is based on industry peers, while scoring in the governance pillar is based on the country of incorporation. The latter is because governance practices are more consistent across countries than industries. We retrieve the total score, pillar scores, and category scores for each firm.

Each category within the three pillars and the pillars themselves receive weights according to their relative importance. Weights vary based on industry or country. The percentile rank score is calculated as follows:

$$Score = \frac{No.\ of\ companies\ with\ a\ worse\ value + \frac{No.\ of\ companies\ with\ the\ same\ value}{2}}{No.\ of\ companies\ with\ a\ value} \tag{4.1}$$

Relative scoring will impact how much different ESG initiatives are valued in scoring, compared to using, e.g., an equal-weighted or absolute score. Thus, firms might increase their score more by focusing on categories or pillars with poor peer performance. Scoring based on percentile ranks results in a score from 0-100, minimizing the influence of outliers. An additional advantage is that the score determines whether a company performs relatively "good" or "bad" instead of the methodology or Refinitiv labeling companies as one or the other. Thus, we regard the scoring methodology as relatively quantitatively focused, which is advantageous since it is more objective and less biased.

4.3.2 Disclosure and Transparency

Weighting increases the relative importance of data points. Furthermore, scoring is subject primarily to a company's disclosure, which is accounted for explicitly. Not reporting less important data points does not affect score a lot, while not disclosing more material data points is penalized more severely. Accounting for transparency implies that disclosure adjusts the score across all three pillars of ESG. All else equal, a firm disclosing relatively more than its peers should therefore receive a higher score. Thus, scores incorporate performance and disclosure.

4.4 Sample construction

Our initial M&A sample contains deals where the target or acquirer has received an ESG-score during the last 15 years. Further, we consider public targets, all countries in the database, and deals since 2006. We only include deals where the acquirer initially owns under 50% of the target, raising its stake to over 50% in the deal. This query yields a total of 8 568 deals. We include private acquirers to maximize the sample size.

Minority stake purchases might be affected by regional differences in disclosure requirements (Rossi & Volpin, 2004), potentially interacting with the disclosure component of ESG scores. Thus, selecting only majority purchases removes this cross-border disclosure bias.

We remove deals where the target identification code is missing (because adding financial variables would be impossible). We also remove deals without data on the premium; duplicate deals; financial acquirers[14] per standard practice; firms with "government and agencies" as their macro industry[15]; and deals where the target and acquirer is the same firm (e.g., self-tenders). This sample contains 6 167 deals.

We use the ESG score from the announcement year[16] since the score from subsequent years might be influenced by efforts to look more ESG friendly to attract more attention from prospective bidders, known as "Greenwashing" (Furlow, 2010). Additionally, acquiring firms might also implement measures in their targets that affect ESG during and after the

[14] As defined by the SDC database.

[15] As defined by the SDC database. This category contains government entities.

[16] In the robustness section, we test whether the results from hypothesis 1 are robust to using the score from the year before the announcement year.

integration process. Regardless, we are interested in the score which reflects the target's focus on ESG factors when a deal is considered.

Matching the score to the deal announcement year leaves us with 892 deals. After adding financial information, our sample consists of 762 deals. We will use the subsample where acquirers also have a score in some models since this relationship is not well researched[17]. The sample selection stages are summarized below, in Table 4.1.

Table 4.1: **Sample Selection and Creation**

Filter	**Number of Deals**
Public target, all countries, announcement date from 01.01.2006, from under 50% to over 50% ownership	8 568
Target identifier	(44)
Deal premium	(1287)
Remove duplicate deals	(0)
Remove financial acquirers	(1054)
Remove government and agencies	(4)
Remove self-tenders (same target and acquirer)	(11)
Remove deal without announcement date data	(1)
Number of deals before adding ESG score	**6167**
ESG score in the announcement year	(5275)
Remove deals without financial data	(130)
Final sample size	**762**
Sample size when acquirers has score as well	475

Source: SDC & Refinitiv

We have included a breakdown of the number of deals by announcement year (Table 4.2) and macro industry (Table 4.3). Most of the deals in our sample are recent: more than half are from 2018 until today. The distribution is relatively even between target industries, with financials, energy and power, industrials, and materials all having from 107 to 91 targets included in the sample. The financial industry is the most active for acquirers, with 243, with the other industries having similar numbers of targets and acquirers.

[17]Of the articles reviewed, only Malik (2014) controls for acquirer performance. Her approach uses CSR scores.

Table 4.2: **Deals by Announcement Year**

Deal Announcement Year	Number of Deals	Percentage of Total	Mean Premium
2006	11	1.44	20.08
2007	16	2.09	21.23
2008	10	1.31	22.98
2009	8	1.04	25.02
2010	8	1.04	34.01
2011	15	2.09	19.00
2012	24	3.13	28.69
2013	21	2.87	22.74
2014	47	6.14	28.59
2015	80	10.44	26.06
2016	76	9.92	27.23
2017	58	7.57	32.77
2018	95	12.40	26.28
2019	122	15.93	28.98
2020	171	22.58	30.92

Source: SDC. The mean premium for the entire sample of 766 deals is 28.12%.

Table 4.3: **Deals by Macro Industry**

Industry	Number of Targets	Number of Acquirers	Mean Premium
Financials	107	243	19.65
Energy and Power	105	88	25.80
Industrials	91	73	25.56
Materials	90	73	30.01
High Technology	80	55	38.96
Media and Entertainment	56	44	31.50
Healthcare	50	42	39.99
Retail	43	35	26.45
Real Estate	40	26	17.21
Consumer Products and Services	36	33	29.57
Consumer Staples	33	26	30.49
Telecommunications	31	24	25.65

Source: SDC

5 Variable Selection

This section will detail all variables used in our models. Furthermore, we will detail our motivation for including the variable in question in light of previous research and economic intuition. We start by examining our dependent variable, the deal premium, before discussing the main explanatory variables, and lastly, the controls. We have included tables with descriptive statistics and a correlation matrix (Table 5.1 and A2, respectively).

Table 5.1: **Summary Statistics**

	Unit	Mean	Median	Min	Max	Standard deviation
Premium	Percent	28.12	26.07	-41.00	129.29	31.18
ESG-scores:						
Target	Number	40.95	38.71	2.07	92.51	19.25
Acquirer	Number	53.14	55.79	7.28	94.18	20.68
Deal-specific variables:						
Cross-border	Dummy	0.39	0.00	0.00	1.00	0.49
Multiple bidders	Dummy	0.14	0.00	0.00	1.00	0.35
Blockhold	Dummy	0.25	0.00	0.00	1.00	0.43
Cash payment	Dummy	0.76	1.00	0.00	1.00	0.43
Share payment	Dummy	0.44	0.00	0.00	1.00	0.50
Industry Relatedness	Dummy	0.47	0.00	0.00	1.00	0.50
Deal value	Million USD	7543.34	2395.79	8.76	95882.84	14529.35
Relative Deal Size	Deal Value/Assets	1.21	0.68	0.00	40.74	2.22
Financial variables:						
Market Capitalization	Million USD	8390.36	2940.00	21.21	105472.23	15689.90
Market to Book	MCap/Equity	4.26	1.75	0.12	135.30	13.51
Leverage	Debt/Equity	1.72	0.61	0.00	119.36	7.94
Growth	Percent	0.09	0.02	-0.82	7.79	0.61
Investment Rate	CapEx/Assets	5.14	3.60	0.00	48.61	6.03
Analyst Following	Dummy	0.33	0.00	0.00	1.00	0.47

Note: Based on 762 transactions. Premium is Winsorized at the 5% level, Financial variables are Winsorized at the 1% level. Source: SDC and Refinitiv

5.1 Dependent Variable

The deal premium is gathered from the SDC database and measured four weeks before the announcement date to eliminate the effect of any takeover rumors or insider trading. Jarell & Poulsen (1989) show that takeover rumors impact price and lead to insider trading: The share price reflected one-third of the premium before the bid announcement. However, the time horizon must be limited to avoid accidentally including effects of fundamental factors which impact the share price in the longer term. Thus, we follow Jory et al. (2016) and Rossi & Volpin (2004) and use a premium calculated from the share price four weeks,

28 days, before the announcement:

$$Deal\ Premium = \frac{Acquisition\ Price\ Per\ Share}{Share\ Price_{t-28}} - 1 \tag{5.1}$$

The mean premium is 28.1%, with a standard deviation of 31.2%, comparable to many of the articles reviewed[18]. We winsorize at the 5% and 95% levels to minimize the influence of outliers. After winsorizing, the premium paid ranges from -41% to 129.3%.

5.2 Explanatory Variables

We use the score from the deal announcement year. A firm might achieve a high score if they are only slightly better than their peers because of relative scoring, as discussed in the previous section. Additionally, disclosure comprises a variable component of the score. The mean score for targets is 40.9, while it is 53.1 for acquirers. Both have significant variation, with values ranging from under 8 to over 92 points for both parties. The standard deviation is close to 20% for both.

We also include the components of the ESG score since the total score includes a lot of underlying data, which might affect premiums differently. Furthermore, using category scores will shed light on value-affecting ESG initiatives, which we will explore in hypothesis one.

5.3 Control Variables

Our control variables are financial, deal-specific, or market-specific (fixed effects). We winsorize continuous variables at 1%. The variable names, definitions, and sources are located in the appendix, in Table A3.

[18] E.g., Dionne et al. (2015); Gomes & Marsat (2018); Betton et al. (2008).

6 Methodology

6.1 Identification strategy

The optimal approach would be to examine a randomly assigned set of firms to estimate the premium. However, our data set only contains firms who have received an ESG score before the deal announcement. A non-random sample potentially introduces a selection bias, as receiving a bid or an ESG score is non-random[19]. If there is a correlation between the error terms of our regression and the selection equation (i.e., the likelihood equation for sample inclusion), OLS estimates might be biased (Heckman, 1979). Firms self-select into being acquirers, which is intuitive because the decision of bidding on another firm is non-random. This mechanism makes it hard to obtain a truly randomized sample when researching M&As, which has implications for causality.

Therefore, in addition to OLS, we employ a two-stage Heckman correction to test and account for potential selection bias (Heckman, 1979). The first stage estimates the likelihood of being included in the sample. The second stage incorporates the results from the first stage through the inverse Mills ratio[20], controlling for possible bias.

Furthermore, other sources of endogeneity may be present. ESG scores are related to the level of ESG disclosure (Refinitv, 2021), so ESG disclosure may be correlated with the level of voluntary financial disclosure, which we will discuss further in section 6.5.2. Therefore, we examine whether OLS estimates may be biased by the omitted variable, affecting informational asymmetry and thus the deal premium. We create consistent estimates by using instrumental variable regression.

Lastly, we will mimic randomization by using matching to investigate whether firms improve their score post-merger. Since this introduces two observations of the same firms (pre and post-merger), we can employ a difference-in-differences approach. Using the matched sample, we will then be better able to infer causality.

[19]Meaning that there is possible selection bias from receiving an ESG score, and self-selection bias from acquirers choosing whether or not to bid on potential targets.

[20]The inverse Mills ratio becomes a control variable, accounting for bias in this manner.

6.2 Hypothesis 1

To analyze the effect of ESG scores on premiums, we employ OLS regression. We first model ESG scores and deal-specific variables; one of the two models controls for the acquirer's ESG score in addition. We then add financial variables and fixed effects to these two specifications, yielding two more models. We do not include country-fixed effects as these exhibit variance inflation factors over 10. Thus, our models can be described by the equation below:

$$Deal\ Premium_i = a + \beta_1 ESG_i + \beta_2 DS_i + \beta_3 F_i + \alpha_i + \theta_t + \epsilon_i \tag{6.1}$$

ESG is the ESG score of the target; *DS* is a vector of deal-specific variables; F is a vector of target financial characteristics; α is the industry fixed effects[21], while θ is the time fixed effects. Model two and four also control for the ESG score of the acquirer, as mentioned.

We check for heteroskedasticity and multicollinearity by using a Breusch-Pagan test and VIF-test, respectively. We report the results in the appendix. We use robust standard errors where applicable. None of the models exhibit problematic values, i.e., factors nearing the broadly accepted cut-off level of 10 (Hair et al., 1995).

Since ESG score is a very aggregated measure of all applicable initiatives in a firm, category scores might offer a clearer picture of which activities affect premia. When inspecting the correlation between the combined ESG score and the three pillar scores (Table A6 in the appendix), we find very high correlations. The correlations imply that our results would be very comparable if we were to replace ESG with one of the pillar scores in the models. As such, we focus on category scores, which are also less aggregated than pillar scores, so the potential effect on premia is less ambiguous. We test this with the third model specification[22].

6.3 Hypothesis 2a and 2b

Interaction effects indicate that a third variable influences the relationship between an independent and dependent variable (Cox, 1984). For our purposes, this would imply

[21] Based on the 14 macro-level industry classifications by the SDC database and the target's industry.
[22] The third model specification controls for deal-specific variables, financial variables, and fixed effects.

that the ESG score interacts with some other variable to affect deal premiums. Thus, the coefficient of ESG score alone (i.e., in models without interactions) might capture some of the interaction effects. This point makes introducing interaction terms in our research beneficial, as it allows us to test our hypothesis.

To determine whether information asymmetry and share payments affect the ESG effect on premia, we include interaction terms between the score and cross-border deals, deals within the same industry, deals with highly followed targets, and deals involving share payments, individually. We build on specification three from hypothesis one.

6.4 Hypothesis 3

To determine whether targets or acquirers improve their score post-merger, we use propensity score matching to mimic randomization, which is advantageous for causal inference. With this matched sample, we perform a difference-in-differences estimation of the average treatment effect - the average increase in ESG score from before the merger to after it. We use the most recent ESG score to measure the treatment effect, so improvements made after the merger are reflected. We test whether acquirers improve their score by merging with a higher-scored target and vice versa.

To measure the transfer of ESG capabilities, we start by calculating the differential in ESG score between the target and acquirer. The rationale is that a higher differential implies that the potential for the transfer of capabilities is more significant than for smaller differentials. We must choose a differential large enough to capture the potential effect while retaining enough observations of the treatment group to get robust results. Thus, we choose a cut-off of 25 points. Summarized below are the means of variables when segmenting by the treatment and control groups before and after merging.

6.4.1 Propensity Score Matching

Propensity score matching estimates the treatment effect by accounting for covariates that predict receiving the treatment. Not using propensity score matching leaves possible biases in our existing sample since differences in treatment outcome (increase in ESG score) may be caused by factors predicting treatment rather than the treatment itself. Propensity score matching ensures that covariates used for matching are balanced (i.e.,

Table 6.1: **Descriptive Statistics - Premium and Scores**

	Acquirers		**Targets**	
Group:	Treatment	Control	Treatment	Control
Pre-merger:				
Premium	26.8	23.8	29.3	26.0
Score Differential	36.8	-15.0	40.0	2.08
Acquirer Score	22.4	51.2	68.7	43.3
Target Score	59.3	36.2	28.6	41.2
Post-merger:				
Score Differential	23.6	-15.6	36.3	5.90
Acquirer Score	33.7	55.3	73.4	50.5
Target Score	57.3	39.7	37.0	44.6

Note: Mean values of variables of interest for the treatment and control groups before and after merging.

the means are not statistically different post-matching) (Rosenbaum & Rubin, 1983).

We first estimate the propensity score for each observation to construct the control group. We include firm location, industry relatedness, relative deal size, target size, and target market to book ratio as covariates. These may explain the increase in score from before the merger to after it (the treatment effect). The primary purpose of the method is not to predict selection into treatment as well as possible but to balance all covariates (Caliendo & Kopeinig, 2008).

Next, we apply logit as our distance measure. Since our treatment is binary, the model choice is not crucial for distance measurement (Caliendo & Kopeinig, 2008). We use nearest neighbor matching, meaning that observations closest in propensity score to the treatment group are included in the control group. Following Rosenbaum & Rubin (1983), we conduct t-tests to assess the matching quality. These tests show no significant differences in means after matching. We have included the results in Table 6.2 below.

6.4.2 Difference-in-differences

Difference-in-differences allows us to mimic an experimental research design using the matched sample, potentially increasing the robustness of our findings (Angrist & Pischke, 2008). Difference-in-differences mitigate selection bias, systematic bias, and the impact of external factors (Rosenbaum & Rubin, 1983), which is particularly relevant in our study. In addition to the assumptions in OLS, difference-in-differences assume parallel trends

Table 6.2: **Descriptive Statistics - Covariates Before and After Matching**

	Acquirers			**Targets**		
Group:	Treatment mean	Control Mean	T-statistic	Treatment mean	Control Mean	T-statistic
Pre-matching: *(No. obs.)*	*18*	*349*		*102*	*265*	
Industry Relatedness	0.500	0.587	0.704	0.490	0.619	2.217**
Relative Deal Size	0.873	1.400	2.275**	2.06	1.11	-3.188***
Size	6.988	9.337	0.870	7.719	9.799	1.292
Market to Book	2.71	4.27	2.030**	5.63	3.64	-1.349
Post-matching: *(No. obs.)*	*18*	*43*		*102*	*102*	
Industry Relatedness	0.500	0.558	0.405	0.490	0.461	-0.419
Relative Deal Size	0.873	0.906	0.135	2.06	1.42	-1.899
Size	6.988	5.114	-0.673	7.719	6.450	-0.869
Market to Book	2.71	3.24	0.565	5.63	3.87	-1.038

Note: *p < 0.1; **p < 0.05; ***p < 0.01.

between the treatment and control groups (Angrist & Pischke, 2008). Using propensity score matching increases the likelihood of fulfilling this assumption since the covariates are balanced after matching.

In addition to the treatment variable, we include a time dummy, signifying whether the observation is pre or post-merger. Thus, we arrive at the following equation for our difference-in-differences model:

$$ESG\ Improvement = \beta_0 + \beta_1 T + \beta_2 S + \beta_3 (T \cdot S) + \alpha + \theta + \epsilon \tag{6.2}$$

T is the time dummy, S is the treatment dummy, and T^*S is the interaction between the two, capturing the difference-in-differences estimator. To isolate the effect, we employ entity (α) and time (θ) fixed effects. We cluster the standard errors by entity to account for possible issues with autocorrelation. Clustering leaves the difference-in-differences estimator ($\hat{\delta}$) - the average increase in ESG score from before the merger to after it.

6.5 Endogeneity Concerns

To address potential endogeneity concerns and test the robustness of our results, we use two approaches – a Heckman correction for selection bias and an instrumental variable approach for other types of endogeneity.

6.5.1 Selection Bias

To some extent, firms choose to disclose the necessary amount of information to receive an ESG score. Furthermore, it is reasonable to assume that when disclosure is voluntary, firms with good ESG performance will be more inclined to disclose their actions than those with worse performance (Hummel & Schlick, 2016). Firms can use disclosure to signal good performance financially and in terms of ESG.

If scored firms are not a random subset of the population, OLS might yield inconsistent estimates (Kai & Prabhala, 2007). Such bias results from non-random selection and is a special case of omitted variable bias (Heckman, 1979).

Methodologically, the correction entails first estimating a probit model on the likelihood of being scored at the deal announcement time before using these results in the second-stage regression to correct for possible bias. We model the likelihood of being scored as a function of location, industry related deals, and industry dummies. Including location is inspired by the scoring methodology (Refinitiv, 2021), while the latter variables are inspired by the implementation by Aktas et al. (2011). The probit equation is thus as follows:

$$Scored = Industry\ Relatedness_i + \alpha_i + \tau_i + \upsilon_i \tag{6.3}$$

The likelihood of receiving a score depends on *industry relatedness*, industry fixed effects (α), and region (τ). Variables in the probit model not included in the second stage OLS are referred to as exclusion restrictions, Z. At least one of these should be statistically significant for the correction to be valid (Puhani, 2000). Thus, region becomes our exclusion restriction since it is not included in the second stage.

We obtain the inverse Mills ratio from the first stage and use this as an additional control variable in the second stage regression. This yields coefficients that are corrected for the likelihood of selection because including the inverse Mills ratio corresponds to including the omitted variable (Kai & Prabhala, 2007). If the inverse Mills ratio is significant, there exists a bias since receiving a score and premia are related. Thus, our second-stage regression estimates the following:

$$Deal\ Premium = a + \beta_1 ESG_i + \beta_2 DS_i + \beta_3 F_i + \alpha_i + \theta_t + \mu\hat{\lambda}_i + \xi_i \tag{6.4}$$

ESG is the ESG score of the target; *DS* is a vector of deal-specific variables; F is a vector of the target's financial characteristics; α are industry-fixed effects; θ are time-fixed effects; λ is the inverse Mills ratio. We use specification three from hypothesis one, adding the inverse Mills ratio. We also perform the correction on the models from hypothesis two.

We implicitly assume that voluntary disclosure affects whether a firm receives a score and the deal premium[23] when correcting for possible bias. The first point seems intuitive - that the scoring methodology requires some level of disclosure to score firms. The second point holds if, e.g., more information from voluntary disclosure increases the accuracy of valuations, impacting premia.

6.5.2 Other Sources of Endogeneity

We control for other sources of endogeneity, such as reverse causality bias or bias resulting from other omitted variables. Using country-year and country-industry means of ESG scores as instruments[24], we estimate a two-stage instrumental variable regression on model three from hypothesis one and the models from hypothesis two.

Scoring is, in part, determined by the voluntary disclosure level of firms (Refinitiv, 2021). The level of ESG-relevant disclosure may be correlated with the level of voluntary financial disclosure on the firm level[25], affecting the degree to which potential bidders are informed. The intuition is that since ESG-related disclosure is voluntary to some extent, firms who disclose more are be more likely to exhibit similar behavior regarding financial disclosure. For example, Kim et al. (2012) theoirze that firms with good CSR performance are more transparent and reliable in financial reporting. Higher quality disclosure is related to a lower cost of capital (Diamond & Verecchia, 1991; Botosan, 2006), potentially making the target more attractive and raising premiums.

On the other hand, higher disclosure may reduce the risk of overvaluation. Thus, the direction of the potential bias is ambiguous. If ESG correlates with the error term in OLS, endogeneity may exist. Two criteria need to be met in order to create consistent

[23] Which means that there exists a bias if the error terms of the two stages are correlated (Heckman, 1979).

[24] Country-year and country-industry means are computed using the entire Refinitiv database.

[25] Voluntary disclosure refers to disclosure exceeding the minimum required by law.

estimates: instrument relevance[26] and exogeneity (Stock & Watson, 2012):

$$\begin{aligned} Relevance &: Cor(Z_i,\ ESG_t) \neq 0 \\ Exogeneity &: Cor(Z_i,\ \mu_i) = 0 \end{aligned} \tag{6.5}$$

The rationale behind using average scores as an instrument is that the ESG performance of a firm is influenced by the ESG performance of its industry peers in the same country and the ESG performance of other firms in the country over time (Cheng et al., 2013). Therefore, we follow Gomes & Marsat (2018) in our choice of instruments. The instruments are then detached from the potential firm-specific levels of unobserved effects. Thus, we expect the instruments to satisfy the exogeneity requirement. However, if the unobservables are country- or industry-specific, our instruments may prove to be endogenous as well. For example, suppose the level of voluntary financial disclosure or earnings quality varies by country-industry or by country-year. In that case, these may be reflected in the average ESG scores and endogenize our instruments. Therefore, we acknowledge that the instruments are conditionally valid.

We remove observations where the country-year and country-industry pairs have only one observation, as the average, in that case, would be the ESG score of the single firm. To test for the relevance and exogeneity conditions, we conduct an F- and J-test, respectively. The results of our first-stage F-tests are displayed in Table 6.3. All models have F-statistics well above the widely accepted cut-off of 10 (Staiger & Stock, 1997), indicating that our instruments are relevant and strong[27].

Table 6.3: **IV: F-Test**

Model	Hypothesis 1	Analyst Following	Share Payment
F-statistic	32.79	22.69	22.08

The F-statistic has a cut-off of 10.

As we have more instruments than endogenous variables, our model is overidentified, and we can conduct a J-test for exogeneity. The p-value reported from the overidentification test is 0.747[28], so we cannot reject the null hypothesis that our instruments are exogenous

[26] Instruments are denoted with $Z.\ \mu_i is the error term from the general OLS equation$

[27] The first stage results are reported with the second stage results, in the results section.

[28] Tests for the other specifications yield similar results.

under the assumption that at least one of the instruments is exogenous. Therefore, we proceed with using these two instruments to estimate our IV models.

7 Results

This section presents our findings and discuss them, drawing on the previous sections. We start with the hypothesis one specifications, looking first at the aggregated ESG score, before discussing the results when using category scores. Then, we discuss our findings from hypothesis two a and two b. Lastly, we present our findings from hypothesis three.

7.1 Hypothesis 1

7.1.1 ESG-Scores

We have included the regression output in Table 7.1. Initially, we run four regressions as described in the methodology section. Since model three shows a significant effect from target ESG score on deal premiums, we focus on this specification.

In the third specification, the target ESG score is statistically significant at a 5% level. An increase in ESG score of one standard deviation yields 2.9 percentage points more premium, ceteris paribus. In practice, this would imply that a target with a market capitalization of 5.9 billion dollars (the approximate mean market capitalization the premium is calculated from) would be paid an additional 169 million dollars if their score increased by one standard deviation. Furthermore, compared to the mean sample premium of 28.1%, this effect is substantial from the perspective of economic significance. Isolated, this result suggests that ESG initiatives are valuable, consistent with the stakeholder view. However, this assumes that an increase in score of one standard deviation costs less than the value added in the transaction. Whether this is plausible or not is outside the scope of this thesis. Regardless, the results support our original hypothesis.

We argue the point above because higher ESG scores might lead to better or more ESG-related capabilities. These are intangible and ambiguous by nature, making them challenging to value (Gomes & Marsat, 2018). An example of this is where a firm increases its ESG performance, which might lead to better relationships with stakeholders (Godfrey et al., 2009), potentially creating a competitive advantage. Further, high scores might reflect strong ethics and organizational culture (Choi et al., 2015), e.g., increasing the motivation of employees to the benefit of the firm in question. Evidently, the total effect might result from multiple ambiguous, smaller effects, as theorized in the literature review.

This vagueness motivates us to look closer at category scores.

We arrive at the same conclusion as most of the findings contained in our literature review. For example, Gomes & Marsat (2018) found an increase in premium of 5.5 percentage points, following an increase in target CSR score of one standard deviation. Since they ignore the governance pillar, the difference in effect might be that governance impacts premium negatively in our sample. However, this is not the case, as replacing the ESG score with governance score in specification three yields a significantly positive effect[29]. Thus, the difference might be attributable to the choice of control variables or the time period. Focusing on the latter of the two, the difference may suggest that acquirers were more willing to pay a premium for good ESG performance previously. This finding might be due to fewer firms committing resources to ESG initiatives previously, making good ESG performance more scarce than it is currently.

We also note that if good ESG performance reduces information asymmetries, it may mitigate adverse selection and its associated risks. In this instance, acquirers will be more certain about the actual quality of the target, consistent with the signalling argument by Choi et al. (2015) and the findings of Cormier & Magnan (2014). This further implies that high-quality targets could receive a higher premium, and vice versa for low-quality targets, consistent with the lemons problem (Akerlof, 1978). High-quality targets are therefore incentivized to increase disclosure and transparency, raising their potential payoff. Of course, this would mean that valuations would become more accurate, implying that the ESG effect on premia would be positive for higher-quality targets and negative for lower-quality targets (Datar et al., 2001). This point also illustrates how the effect of reduced information asymmetries may have an ambiguous effect on deal premia, warranting further investigation in hypothesis 2.

The point above is related to the risk-mitigating effects of ESG as well. If reduced asymmetric information lowers the risk of misvaluation (Malik, 2014), it lowers overall risk as well. This implies that these effects are intertwined, but acquirers might be willing to pay more for less risky targets, consistent with the findings discussed in the literature review (Datar et al., 2001).

The target score is only significant in the third specification. When not controlling for

[29]Regressions with pillar scores are reported in the appendix, in Table A7

financial variables, the effect vanishes. The same is true when controlling for acquirer score in model 4. The first point indicates that the introduction of financial characteristics increases the predictive validity of ESG scores. As such, when we control for financial and deal-specific characteristics, some unexplained variation in premiums is explained by the ESG score of the target. It should be reiterated that the sample is reduced to 475 deals when including the acquirer score as well, which also might explain the insignificance.

The signs of our controls are mostly consistent with our expectations from the literature review. Even though extant research has shown ambiguous effects on premiums from most variables, our results are mostly consistent with intuition, the majority of scholars, and the theory discussed earlier.

Unsurprisingly, multiple bidders yield a significantly positive effect on premia. Disregarding "no applicable" deal attitudes[30], this is the most considerable absolute effect on premia in our findings, accounting for nearly one third to two thirds of the mean premium. Our results more closely resemble those of Varaiya (1987), who finds an increase of 18.75%, than Fidrmuc (2013), who finds a negative effect. Having a blockhold lowers premia, consistent with extant research[31]. In hostile deals, the effect is positive - from 10.2 to 16.6 percentage points higher premiums - which we also expected. It seems that cash payments lead to higher premiums, while the opposite is true for share payments. In the context of the applicable theory and what the payment methods proxy for, this seems sensible.

Both of the size metrics impact premium significantly but with opposite effects. Given the vast array of effects size might proxy for, this is perhaps not so surprising. We find a significantly negative effect on premia from the investment rate, indicating that relatively more investment is seen negatively by acquirers.

[30]We do not offer this result much attention as only 9 deals in the sample are classified as "No applicable" deal attitude. There are only 5 "Neutral" deals, so the same is true for these.

[31]E.g. Dionne et. al (2015); Walkling & Edmister (1985).

Table 7.1: **Regression Analysis on Deal Premiums**

	Dependent variable:			
	Deal Premium			
	(1)	(2)	(3)	(4)
Target ESG	0.047	−0.002	0.149**	0.079
	(0.056)	(0.069)	(0.073)	(0.090)
Acquirer ESG		0.017		−0.020
		(0.063)		(0.072)
Cross-border	1.657	0.489	2.100	1.159
	(2.224)	(2.633)	(2.403)	(2.785)
Multiple Bidders	11.796***	12.910***	12.332***	15.529***
	(3.135)	(3.530)	(3.783)	(4.085)
Blockhold	−13.132***	−12.443***	−9.605***	−9.925***
	(2.572)	(3.342)	(2.728)	(3.505)
Hostile Deal	10.192*	13.263**	12.011*	16.600**
	(5.588)	(6.452)	(6.320)	(7.751)
Neutral Deal	−2.932	−8.589	−6.022	−17.997**
	(13.180)	(19.052)	(11.906)	(7.331)
No Applicable Attitude	−29.013***	−33.309*	−26.394***	−28.922**
	(9.916)	(18.914)	(6.682)	(11.757)
Unsolicited Deal	−4.571	−3.752	−2.675	−2.507
	(2.955)	(3.677)	(3.238)	(4.032)
Cash Payment	14.159***	13.010***	12.366***	11.790***
	(3.228)	(3.298)	(3.331)	(3.516)
Share Payment	−6.808**	−9.553***	−4.883	−6.419*
	(2.857)	(3.128)	(3.184)	(3.279)
Industry Relatedness	−0.312	2.990	−0.790	1.638
	(2.246)	(2.528)	(2.320)	(2.468)
Relative Deal Size			3.234***	2.291***
			(0.740)	(0.815)
Ln(Size)			−2.135*	−1.235
			(1.116)	(1.283)
Market to Book			−0.245	−0.104
			(0.151)	(0.211)
Leverage			0.292	0.365
			(0.240)	(0.469)
Growth			2.987	2.115
			(1.932)	(1.812)
Investment Rate			−0.529**	−0.480*
			(0.252)	(0.261)
Analyst Following			−3.540	−3.653
			(2.435)	(2.726)
Constant	20.404***	23.244***	61.831**	47.702
	(4.281)	(5.326)	(25.393)	(29.014)
Industry Fixed Effects	No	No	Yes	Yes
Year Fixed Effects	No	No	Yes	Yes
Observations	762	475	762	475
R^2	0.139	0.178	0.212	0.275
Adjusted R^2	0.126	0.157	0.165	0.201
Residual Std. Error	29.081 (df = 750)	26.470 (df = 462)	28.421 (df = 718)	25.776 (df = 430)
F Statistic	10.982*** (df = 11; 750)	8.362*** (df = 12; 462)	4.504*** (df = 43; 718)	3.706*** (df = 44; 430)

Note: *p<0.1; **p<0.05; ***p<0.01

7.1.2 Category Scores

Next, we re-run model three with the ten category scores instead of the aggregate ESG score. We include the results in Table 7.2 below. The Table contains three categories: resource use, human rights, and management, as these are the statistically significant categories. Interestingly, this means that exactly one category from each pillar is significant, which might allude to their relative importance compared to the insignificant ones. All pillars are important if a firm wants its ESG performance to be valued. For all three categories, the control variables remain largely similar.

Increasing the category score by one standard deviation would yield a premium of 3.1, 2.4, and 2.0 percentage points higher for resource use, human rights, and management, respectively. A firm with a market capitalization of, e.g., 3 billion dollars, would receive an additional 60 to 93 million dollars in a deal. Still, whether the gains exceed the costs of raising the score is hard to determine because the relationship between score improvements and costs is hard to observe.

The relationship between costs and management or governance structures[32] is perhaps even more complex than for the other categories. The reason is that the costs associated with adhering to best-practice governance principles are not readily observable, making the relationship between management score improvements and costs unobservable as well.

Our findings imply that acquirers value resource-efficient targets relatively more. Targets with a strong performance in this category might have specific capabilities or advantages which allow them to operate more efficiently. Such competitive advantages can, for example, reduce costs, leading to realizable synergies consistent with the synergy hypothesis discussed in section two. Thus, our findings support extant research in that good ESG performance can enhance or create synergies (Deng et al., 2013; Aktas et al., 2011; Malik, 2014).

A firm increasing its category score by one standard deviation is equivalent to raising it by 32-28 points. Since scoring is relative, this implies that, e.g., a firm with a score in the second to lowest quartile (25-50) would increase their score up to the second-highest or highest quartile (50-100). Intuitively, this seems very hard to accomplish in practice

[32]The management category score explicitly accounts for how well the firm adheres to best-practice governance principles, which is why it is relevant in our discussion.

but could perhaps be possible in an industry where the score of peers is poor. Another interesting finding is that targets can receive higher premiums by increasing their resource use score by one standard deviation than increasing their overall ESG score by one standard deviation. We argue that these differences might be due to the relatively more tangible characteristics of resource use which may act as a clearer signal to the acquirer, consistent with Choi et al. (2015). Since increasing the overall score based on ten categories is much more complicated than increasing one category, our findings suggest that targets are much better off focusing on their resource use.

Further, drawing on the results from Chatterji et al. (2009), we find it likely that this concern is applicable for category scores as well. Taking the human rights category as an example, it seems to be the most qualitative of the three categories since it judges adherence to human rights conventions. Intuitively, this seems very hard to measure, given the complexity of, e.g., multinational corporations operating in many different regions and that undesirable behavior is often hidden from the public's view. For example, many firms use factories in developing countries to save costs, where working conditions are harsh. Such intricate relationships might be hard to detect for score providers, especially through publicly available documentation. The previous point reinforces that the intangible nature of ESG initiatives are hard to value (Gomes & Marsat, 2018).

To summarize, we find a significantly positive effect of ESG on premia. We argue that the observed effect is economically significant since ESG capabilities potentially provide value to the firm. We also note that whether these capabilities are truly valuable depends on the costs of increasing ESG performance, a relationship that is hard to observe. The same is true for the category scores discussed in the second part of the hypothesis. We find that firms might be better off focusing on individual categories if they want their efforts to be valued in an M&A. Our findings show that resource use, human rights, and management are the most significant individual categories in terms of premia.

Table 7.2: **Regression Analysis Using ESG Category Scores**

	Dependent variable:		
	Deal Premium		
	Resource Use	Human Rights	Management
Category Score	0.099**	0.078*	0.072*
	(0.046)	(0.043)	(0.040)
Cross-border	1.600	1.658	2.338
	(2.370)	(2.361)	(2.382)
Multiple Bidders	11.317***	12.125***	12.310***
	(3.735)	(3.779)	(3.797)
Blockhold	−9.896***	−9.755***	−9.205***
	(2.754)	(2.748)	(2.739)
Hostile Deal	12.620**	12.461**	12.232*
	(6.252)	(6.176)	(6.365)
Neutral Deal	−6.811	−5.680	−5.144
	(12.299)	(11.163)	(12.154)
No Applicable Attitude	−26.089***	−27.816***	−25.285***
	(6.987)	(7.021)	(7.048)
Unsolicited Deal	−1.939	−2.169	−2.076
	(3.222)	(3.306)	(3.234)
Cash Payment	12.066***	11.879***	12.372***
	(3.296)	(3.303)	(3.314)
Share Payment	−5.537*	−5.501*	−4.676
	(3.120)	(3.118)	(3.163)
Industry Relatedness	−0.328	−0.565	−0.680
	(2.295)	(2.307)	(2.323)
Relative Deal Size	3.167***	3.066***	3.099***
	(0.711)	(0.699)	(0.736)
Ln(Size)	−2.151*	−1.879*	−1.613
	(1.134)	(1.085)	(1.048)
Market to Book	−0.237	−0.233	−0.222
	(0.150)	(0.146)	(0.155)
Leverage	0.293	0.266	0.261
	(0.239)	(0.236)	(0.244)
Growth	2.730	2.603	2.651
	(1.913)	(1.947)	(1.944)
Investment Rate	−0.545**	−0.546**	−0.560**
	(0.250)	(0.251)	(0.253)
Analyst Following	−3.205	−3.047	−2.848
	(2.407)	(2.414)	(2.406)
Constant	65.231**	62.306**	51.169**
	(26.051)	(25.583)	(24.472)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	760	760	762
R^2	0.213	0.210	0.211
Adjusted R^2	0.165	0.162	0.163
Residual Std. Error	28.258 (df = 716)	28.306 (df = 716)	28.455 (df = 718)
F Statistic	4.496*** (df = 43; 716)	4.424*** (df = 43; 716)	4.453*** (df = 43; 718)
Note:			*p<0.1; **p<0.05; ***p<0.01

7.2 Hypothesis 2

Our contextual proxies for asymmetric information yield mixed results, as shown in Table 7.3. The Table includes interaction terms for cross-border and industry-relatedness with the ESG score of the target, respectively. Interestingly, in both, the ESG score on its own is still statistically significant at the 5%-level, while the interaction terms are both statistically insignificant. These results indicate that the effect of ESG on premia in cross-border deals and deals within the same industry do not differ from other deals. These findings contradicts hypothesis two a. One possible explanation may be that acquirers conduct extensive due diligence and do not receive any marginal information from ESG-related activities (Chen & Gavious, 2015). Moreover, if acquirers increase their due diligence to offset the increased uncertainty, this might explain the lack of differential effect in cross-border deals. The ambiguity in effect of cross-border deals[33] may also further explain the insignificant interaction with the ESG score.

On the other hand, the interaction between the ESG score of the target and the indicator for being in the upper tertile of most analyst-followed companies is significant at a 5% level. When the target has a high degree of analyst following, the effect of the target's ESG score on premia is on average 0.250 lower than for targets that do not have a high analyst following. The effect of ESG on premia is 0.229, meaning that the effect of ESG score on premia in deals with highly followed targets is substantially reduced. This result means that, on average, ESG is less important in deals where there is relatively little asymmetric information, which supports our hypothesis. One explanation may be that as ESG engagements may act as signals (Choi et al., 2015). The effect of these signals may be less critical when information asymmetries are already low. This result supports extant literature claiming that the effect of ESG on premia is partly due to reductions in information asymmetry.

Overall, we do not find evidence that the effect of ESG on premia is different in cross-border and same-industry deals. We find, however, that the effect of the targets' ESG score seems to diminish in deals when the target has a high analyst following. Thus, while we cannot ascertain a definite relationship between asymmetric information and the ESG effect on premia through deal-specifics, we find some support for our hypothesis.

[33] As discussed in section 2.3.

Therefore, we argue that part of the positive effect of ESG on premiums is due to reductions in information asymmetries, at least insofar as using analyst following as a proxy for asymmetric information.

Regarding hypothesis two b, Table 7.3 shows the specification when including an interaction term between share payments and the target's ESG score. The main effect of the target's ESG score, i.e., the effect when share payments are not used, is 0.255, significant at a 1% level. Including an interaction term between share payments and the target's ESG score, we find that the interaction effect is -0.217, significant at the 10% level. This means that the effect of the ESG score on premiums is diminished when the deal includes payment with shares. This may be due to the diminutive effects of share payments on adverse selection and risk (Hansen, 1987). It is intuitive that if some risk is already alleviated through share payments, the marginal risk-reducing capabilities received through ESG-related capabilities- and information as proposed by, e.g., Choi et al. (2015) and Godfrey et al. (2009) may be of reduced importance. This finding supports the idea that ESG may be a tool for risk-mitigation and that it as such partly drives the effect of ESG on premia.

On the other hand, the choice of share payments may signal the acquirer's perceived risk of the deal. This may also affect the due diligence process, where the acquirer performs a higher degree of due diligence if the perceived risk is greater. Then, the importance placed on ESG may be lower.

Ultimately, we find evidence in support of hypothesis two b. We therefore argue that acquirers may value ESG as a tool for reducing risk and adverse selection, and that the effect of ESG on premia may in part be driven by the risk-reducing elements of ESG.

Table 7.3: **Interactions with Target ESG Score**

	Dependent variable:			
	Deal Premium			
	Industry Relatedness	Cross-border	Analyst Following	Share Payment
Target ESG	0.189**	0.215**	0.229***	0.255***
	(0.090)	(0.085)	(0.086)	(0.094)
Interaction	-0.084	-0.111	-0.250**	-0.217*
	(0.113)	(0.121)	(0.115)	(0.117)
Cross-Border	2.173	7.010	2.562	2.428
	(2.335)	(5.567)	(2.320)	(2.402)
Multiple Bidders	12.256***	12.456***	12.140***	11.874***
	(3.687)	(3.684)	(3.676)	(3.757)
Blockhold	−9.641***	−9.897***	−9.765***	−9.797***
	(2.645)	(2.604)	(2.640)	(2.738)
Hostile Deal	12.120**	11.911**	11.388*	12.594**
	(5.900)	(5.834)	(5.817)	(6.294)
Neutral Deal	−6.178	−3.262	−5.902	−5.997
	(9.446)	(9.815)	(9.507)	(11.796)
No Applicable Attitude	−26.344***	−25.786***	−25.732***	−27.054***
	(5.680)	(5.809)	(5.972)	(6.925)
Unsolicited Deal	−2.488	−3.173	−2.047	−2.366
	(3.128)	(3.052)	(3.123)	(3.233)
Cash Payment	12.400***	12.465***	12.398***	12.747***
	(3.203)	(3.252)	(3.228)	(3.325)
Share Payment	−4.779	−5.262*	−4.880	4.347
	(3.065)	(3.106)	(3.096)	(5.859)
Industry Relatedness	2.512	−0.358	−0.518	−0.626
	(5.153)	(2.228)	(2.251)	(2.306)
Relative Deal Size	3.217***	3.492***	3.187***	3.271***
	(0.658)	(0.666)	(0.645)	(0.744)
Ln(Size)	−2.083*	−2.047*	−2.137**	−2.054*
	(1.083)	(1.056)	(1.073)	(1.122)
Market-to-Book	−0.242**	−0.247**	−0.233**	−0.258
	(0.120)	(0.122)	(0.117)	(0.157)
Leverage	0.289	0.285	0.273	0.308
	(0.198)	(0.201)	(0.195)	(0.244)
Growth	3.007*	2.518	3.101*	2.562
	(1.624)	(1.694)	(1.649)	(1.929)
Investment Rate	−0.539**	−0.377*	−0.523**	−0.540**
	(0.237)	(0.213)	(0.234)	(0.251)
Analyst Following	−3.585	−3.306	7.997	−3.978
	(2.373)	(2.397)	(5.603)	(2.451)
Constant	59.472**	56.267**	59.048**	56.213**
	(24.708)	(23.704)	(24.255)	(25.779)
Industry Fixed Effects	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	762	762	762	762
R^2	0.213	0.204	0.217	0.216
Adjusted R^2	0.165	0.168	0.169	0.168
Residual Std. Error	28.431 (df = 717)	28.379 (df = 728)	28.362 (df = 717)	28.369 (df = 717)
F Statistic	4.411*** (df = 44; 717)	5.648*** (df = 33; 728)	4.511*** (df = 44; 717)	4.501*** (df = 44; 717)

Note: *p<0.1; **p<0.05; ***p<0.01

7.3 Hypothesis 3

Table 7.4 shows the results from our matched sample difference-in-differences approach to score increase. Both difference-in-differences estimators are statistically significant - at 10% and 1% for acquirer and target scores, respectively.

Our findings show that acquirers, on average, increase their score by 7.1 points by merging with a target with a score 25 points higher or more. This finding supports our hypothesis and indicates that the transfer of ESG capabilities between transaction parties is indeed possible. Our findings are consistent with Berchicci et al. (2012), further implying that a learning effect exists, as outlined by Aktas et al. (2011).

When looking at the targets' improvement, this effect is slightly smaller, at approximately 5 points. Still, this indicates that the reverse of the case above is also true; that targets can also learn from acquirers (Berchicci et al., 2012). Our findings indicate that deal participants can increase their score significantly by transferring ESG capabilities, suggesting that these are valuable.

Another point worth discussing is the difference in improvement between acquirers and targets. Acquirers might pay specific attention to the ESG performance of their potential targets because they are looking to enhance their performance when they consider which targets to bid on (Berchicci et al., 2012). This argument holds if acquirers view improvements as a way to create synergies, consistent with the synergy hypothesis. For targets, the improvement might come as a side-effect of combining with the acquirer.

A score differential of one quartile implies that the firm with the lower score in the deal has a greater probability of having a score below the average. If this is the case, one might argue that improving a bad score by an arbitrary amount is more straightforward than improving a good score by the same amount. This argument would weaken our conclusion above regarding the significant transfer of ESG capabilities. However, since scoring is based on peer performance, we do not consider this an issue in our study.

A point worth discussing is whether the observed score increase is economically significant. The effect of a score increase is potentially insignificant in practice, but this is hard to determine without knowing what costs these transfers entail. If these capabilities are easy to transfer, an increase is potentially valuable. Additionally, higher ESG performance

might create additional synergies relating to ESG capabilities, which are not captured in the score[34], potentially leading us to underestimate the true effect.

To summarize, we argue that our findings suggest that merging to transfer ESG capabilities between the transaction parties might be seen as a different motive for M&A. At the very least, we have shown that increasing the ESG performance is easier when learning from a higher-scored counterparty, suggesting that the transfer of ESG capabilities is possible in practice.

Table 7.4: **Difference-in-differences Effect of Score Increase**

Ratio equals the number of control firms per treatment firm. Matching with replacement indicates whether control firms can be sampled by multiple treatment firms. NN means Nearest Neighbor matching.

	Dependent variable:	
	Acquirer ESG	Target ESG
Increase in Score	7.114*	4.963***
	(4.087)	(1.716)
Entity Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
Ratio	3	1
Matching With Replacement	Yes	No
Matching Algorithm	NN	NN
Observations	122	408
R^2	0.069	0.040
Adjusted R^2	−0.909	−0.935
F Statistic	4.396** (df = 1; 59)	8.320*** (df = 1; 202)
Note:		*p<0.1; **p<0.05; ***p<0.01

[34]Consistent with Chatterji et al. (2009).

8 Robustness

This section will investigate the robustness of our results. First, we will discuss endogeneity and address possible issues related to omitted variable bias by using a Heckman correction and instrumental variable regression. Then, we will use scores from the year before the deal announcement and split the sample into two periods to test whether the main results, from hypothesis one, are consistent.

8.1 Endogeneity

8.1.1 Heckman Correction

We employ the Heckman correction on the models from hypotheses one and two to account for possible selection bias induced by the connection between premia, scores, and disclosure. The results are in Table 8.1.

Our sample does not exhibit selection bias from scoring, determined by the insignificant inverse Mills ratio. The target score from model three in hypothesis one is still significant at 5%. The coefficient is slightly smaller, decreasing by 0.013. This difference suggests that when adjusting for firms without scores, the effect of having a better score is smaller. Again, given the insignificance of the inverse Mills ratio, we cannot determine if the coefficients of score between hypothesis one and three are different. Because of this, we will not discuss the control variables in great detail, but we do note that their coefficients are broadly comparable to those of hypothesis one. In regards to the second hypothesis, these coefficients are also broadly comparable, including the interactions themselves, expect for analyst following. For this reason, along with the discussion above, we infer that selection bias is not of concern in our study.

Table 8.1: **Heckman Correction**

The first-stage probit model is computed using the entire sample, which is why the number of observations is significantly higher.

	Dependent variable:		
	Deal Premium		
	Hypothesis 1	Analyst Following	Share Payments
Target ESG	0.136**	0.170**	0.240***
	(0.066)	(0.075)	(0.086)
Interaction		−0.117	−0.218*
		(0.124)	(0.117)
Cross-border	2.038	1.969	2.348
	(2.323)	(2.322)	(2.324)
Multiple Bidders	12.662***	12.579***	12.208***
	(3.254)	(3.253)	(3.256)
Blockhold	−10.322***	−10.423***	−10.455***
	(2.764)	(2.764)	(2.759)
Hostile Deal	10.685*	10.560*	11.103*
	(5.862)	(5.859)	(5.853)
Neutral Deal	−5.301	−4.549	−5.218
	(13.822)	(13.836)	(13.792)
No Applicable Attitude	−27.432***	−27.011**	−28.173***
	(10.554)	(10.557)	(10.539)
Unsolicited Deal	−3.760	−3.649	−3.544
	(3.101)	(3.101)	(3.096)
Cash Payment	12.318***	12.597***	12.706***
	(3.402)	(3.413)	(3.401)
Share Payment	−5.073*	−4.973	4.142
	(3.030)	(3.030)	(5.803)
Industry Relatedness	−0.662	−0.621	−0.463
	(2.412)	(2.409)	(2.413)
Relative Deal Size	2.973***	2.980***	3.020***
	(0.558)	(0.558)	(0.557)
Ln(Size)	−2.620***	−2.627***	−2.591***
	(0.834)	(0.834)	(0.833)
Market to Book	−0.224**	−0.228**	−0.237**
	(0.109)	(0.109)	(0.109)
Leverage	0.384*	0.386*	0.404*
	(0.215)	(0.215)	(0.215)
Growth	1.901	1.928*	1.610
	(1.164)	(1.164)	(1.172)
Investment Rate	−0.584***	−0.591***	−0.590***
	(0.206)	(0.206)	(0.205)
Analyst Following	−2.236	2.613	−2.371
	(2.500)	(5.725)	(2.495)
Constant	80.831***	78.572***	78.154***
	(28.225)	(28.303)	(28.218)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	6,163	6,163	6,163
ρ	−0.183	−0.165	−0.224
Inverse Mills Ratio	−5.422 (11.021)	−4.887 (11.024)	−6.698 (11.034)

Note: *p<0.1; **p<0.05; ***p<0.01

8.1.2 Instrumental Variable Regression

Table 8.2 shows the results from the IV regression. The models are estimated with the same procedure and specification as the models in the first and second hypotheses, except for country-year and country-industry averages as instruments for the targets' ESG scores. The estimates for hypothesis one are roughly similar to our OLS estimates - the ESG score is, significantly positive at a 10% level. The same applies to hypotheses two a and b - the ESG main effects are still significantly positive. The interaction between share payments and the predicted values of ESG is also significant. These findings suggest that our estimates do not suffer from endogeneity issues resulting from omitted variable bias or simultaneous causality. However, for hypothesis two a, the interaction between the predicted values of the ESG score and analyst following is not statistically significant. Thus, our IV results are somewhat ambiguous as to whether endogeneity poses a problem. For example, there may be a correlation with the level of voluntary financial disclosure that may cause endogeneity. As discussed in the methodology section, the effect of the potential bias is ambiguous.

In conclusion, we can not strictly rule out the possibility of endogeneity in the model from hypothesis two a. Still, we reiterate that most of our models yield similar results as our OLS models, which suggests that our model does not suffer greatly from endogeneity. Of course, any inference from our IV regression results rests on the assumption that our instruments are exogenous, as discussed in the methodology section. If this does not hold, IV regression estimates may also be inconsistent.

Table 8.2: **Instrumental Variable Regression**

	Dependent variable:					
	Stage 1: Target ESG			Stage 2: Deal Premium		
	Hypothesis 1	Analyst Following	Share Payment	Hypothesis 1	Analyst Following	Share Payment
Country-industry	0.427***	0.386***	0.307**			
	(0.104))	(0.119)	(0.145)			
Country-year	0.340***	0.398***	0.555***			
	(0.115)	(0.133)	(0.139)			
$\widehat{Target\ ESG}$				0.543**	0.757**	0.966***
				(0.273)	(0.296)	(0.319)
Interaction					−0.554	−1.075***
					(0.463)	(0.351)
Cross-border	0.025	−0.017	0.058	1.426	2.500	3.362
	(1.397)	(1.399)	(1.378)	(2.928)	(3.145)	(3.027)
Multiple Bidders	0.243	0.135	−0.491	12.294***	11.379***	10.687***
	(1.809)	(1.815)	(1.905)	(3.964)	(3.998)	(4.048)
Blockhold	−2.280	−2.280	−2.240	−8.286**	−8.193**	−9.817**
	(1.756)	(1.758)	(1.630)	(3.686)	(3.712)	(3.854)
Hostile Deal	−0.797	−0.641	−0.654	7.643	6.371	8.989
	(3.352)	(3.359)	(3.045)	(7.562)	(7.262)	(7.323)
Neutral Deal	6.733	6.551	6.248*	−7.968	−7.924	−6.750
	(7.175)	(7.186)	(3.606)	(10.397)	(10.355)	(10.686)
No Applicable Attitude	−3.124	−2.964	−3.351	−28.561***	−28.614***	−36.828***
	(6.102)	(6.117)	(7.358)	(6.699)	(6.789)	(8.591)
Unsolicited Deal	7.044***	7.219***	7.455***	−5.086	−4.213	−3.752
	(1.843)	(1.856)	(1.878)	(4.317)	(4.378)	(4.296)
Cash Payment	0.998	0.962	0.838	11.220***	11.160***	13.960***
	(1.915)	(1.918)	(2.014)	(3.983)	(3.994)	(3.906)
Share Payment	0.887	0.773	8.211	−5.221	−5.322	40.188***
	(1.711)	(1.718)	(8.009)	(3.882)	(3.908)	(15.047)
Industry Relatedness	−0.411	−0.415	−0.480	0.938	2.090	1.842
	(1.378)	(1.385)	(1.352)	(2.819)	(3.013)	(2.887)
Relative Deal Size	−1.169***	−1.182***	−1.181***	2.974***	2.964***	2.854***
	(0.362)	(0.363)	(0.403)	(0.910)	(0.905)	(0.903)
Ln(Size)	3.341***	3.332***	3.390***	−3.906**	−4.079***	−2.928*
	(0.483)	(0.484)	(0.505)	(1.528)	(1.542)	(1.518)
Market to Book	0.088	0.091	0.088	−0.091	−0.100	−0.098
	(0.104)	(0.104)	(0.087)	(0.183)	(0.183)	(0.191)
Leverage	−0.079	−0.087	−0.066	0.277	0.271	0.326
	(0.179)	(0.179)	(0.160)	(0.389)	(0.392)	(0.424)
Growth	−3.204***	−3.149***	−3.308***	4.254**	4.568**	1.855
	(0.989)	(0.991)	(0.868)	(1.943)	(1.952)	(2.132)
Investment Rate	−0.185	−0.179	−0.177*	−0.605**	−0.588**	−0.671**
	(0.113)	(0.114)	(0.097)	(0.271)	(0.271)	(0.274)
Analyst Following	8.088***	10.310	7.679***	−9.458**	15.574	−10.395***
	(1.662)	(7.685)	(1.600)	(3.865)	(21.670)	(3.914)
Interaction with Country-Year		−0.213	−0.482*			
		(0.238)	(0.248)			
Interaction with Country-Industry		0.154	0.292			
		(0.195)	(0.196)			
Constant	−66.529***	−68.673***	−70.161***	105.983***	105.444***	68.692**
	(13.581)	(13.821)	(12.424)	(34.513)	(34.925)	(34.906)
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	571	571	571	571	571	571
R^2	0.439	0.440	0.445	0.187	0.183	0.162
Adjusted R^2	0.393	0.391	0.396	0.120	0.115	0.092
Residual Std. Error	14.655 (df = 526)	14.671 (df = 524)	14.614 (df = 524)	30.149 (df = 527)	30.239 (df = 526)	30.629 (df = 526)
F Statistic	9.373*** (df = 44; 526)	8.966*** (df = 46; 524)	9.124*** (df = 46; 524)			

Note: *p<0.1; **p<0.05; ***p<0.01

8.1.3 Other Robustness Tests

We also perform OLS regression using scores from the year before the deal announcement and split our sample into two periods - deals up to and including 2017 and from 2018 until 2020. We perform these robustness tests on model three from the first hypothesis. The results are shown in Table 8.3 below.

Our findings are robust to splitting the sample into two approximately equal sizes based on when the deal was announced. The coefficients of the ESG score and the controls are comparable to those of hypothesis one, indicating that our findings have a satisfactory level of robustness. The coefficient of the target's score is slightly higher in recent deals, but both coefficients are still reasonably close to our original estimate using the entire sample.

However, our results are not robust to using the score from the year before the deal announcement. The coefficient is notably smaller and insignificant, indicating that scores from the year before are not drivers of the deal premium. The sample has around 100 fewer deals than the original, which is attributable to lower coverage previously. We note that this robustness test does not capture score improvements made just before the deal, which is unfavorable.

Our impression is not that this finding alludes to "greenwashing"[35] by target firms since a firm would need to improve their ESG performance and have the improvement be reflected in their score before the deal announcement. In this case, the performance improvement and subsequent score increase would have to be carried out from the initial bid and reflected by the time the deal is announced if greenwashing occurs. Because of this, greenwashing seems unrealistic in practice.

Thus, we conclude that our findings are mostly robust, increasing our confidence in our results. Apart from analyst following, the endogeneity robustness tests yield largely the same results as our OLS models. Therefore, we acknowledge the possibility that there may be endogeneity in that specific model but emphasize that the other IV regression robustness tests yielded similar results as our OLS models. We also find the robustness test using the prior year's score to be relatively less relevant, leading to this conclusion.

[35] As discussed in section 4.4.

Table 8.3: **Robustness Test on Results from Hypothesis 1**

	Dependent variable:		
	Deal Premium		
	Deals after 2017	Deals before 2018	Previous Year's Score
Target ESG	0.192*	0.152*	0.101
	(0.098)	(0.086)	(0.083)
Cross-border	−3.180	5.138*	2.098
	(3.413)	(2.930)	(2.539)
Multiple Bidders	14.426***	9.761**	11.937***
	(4.883)	(3.984)	(4.013)
Blockhold	−10.285***	−9.573***	−9.658***
	(3.824)	(3.558)	(2.909)
Hostile Deal	−2.971	19.822***	8.474
	(10.410)	(6.514)	(6.326)
Neutral Deal	−3.569	−5.843	−2.233
	(17.658)	(19.316)	(13.240)
No Applicable Attitude	−31.100*	−23.259**	−16.210***
	(17.747)	(11.476)	(5.494)
Unsolicited Deal	−0.302	−5.139	−0.959
	(4.503)	(4.051)	(3.469)
Cash Payment	9.897**	14.769***	13.304***
	(4.903)	(4.314)	(3.708)
Share Payment	−10.194**	−1.091	−4.958
	(4.399)	(3.797)	(3.481)
Industry Relatedness	−1.206	0.324	−2.199
	(3.430)	(3.014)	(2.411)
Relative Deal Size	1.694	3.012***	3.228***
	(1.129)	(0.915)	(0.781)
Ln(Size)	−2.249*	−1.906*	−1.190
	(1.202)	(1.133)	(1.057)
Market to Book	0.342	−0.334***	−0.280**
	(0.373)	(0.128)	(0.136)
Leverage	−0.121	0.312	0.150
	(0.544)	(0.208)	(0.191)
Growth	3.173	3.553	5.277*
	(2.120)	(4.033)	(2.997)
Investment Rate	−1.026***	0.337	−0.619**
	(0.266)	(0.268)	(0.285)
Analyst Following	−4.856	−2.546	−4.094
	(4.268)	(3.335)	(2.538)
Constant	75.461***	47.368**	47.239**
	(26.411)	(23.252)	(23.770)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	386	376	666
R^2	0.261	0.216	0.216
Adjusted R^2	0.196	0.176	0.162
Residual Std. Error	29.076 (df = 354)	26.946 (df = 357)	27.736 (df = 622)
F Statistic	4.032*** (df = 31; 354)	5.449*** (df = 18; 357)	3.989*** (df = 43; 622)

Note: *p<0.1; **p<0.05; ***p<0.01

9 Limitations of Research

To better nuance our contribution, we will address some of the main limitations of our research and approach. Based on these limitations, we outline avenues for future research, which can provide increased context, support, or rejection of our results.

Relative scoring implies that firms who are only slightly better than average (especially if the distribution of firms has a low variance) might receive a higher score than comparable firms. This point might skew our results since a component of the score is industry or country-dependent. We also reiterate that scoring a firm based on ESG initiatives might not necessarily capture the actual ESG performance of the firm in question. Thus, if we were able to observe the actual performance, our results may have been different. However, we view these ESG scores as the most applicable measure of such performance currently available.

We find the lack of convergence and consistency across the major providers to be unfortunate. Thus, we acknowledge the possibility that our results are mainly relevant to the Refinitv ESG scores. Testing our models on data from other providers is difficult as the coverage differs significantly between providers. Differences in coverage would imply that the sample would be different, so we could not provide a definitive conclusion.

Researching M&As is complex due to the inherent self-selection mechanisms present in every transaction. For targets, the probability of receiving a bid and a score is also non-random. We have tried to correct for the latter using the Heckman correction. If specific characteristics increase the likelihood of receiving a bid as well as the deal premium, this might also create selection bias. Ultimately, this makes random sampling unrealistic in practice, especially in our context, because of the limited coverage of ESG scores. Further, we do not fully reject endogeneity through our IV regression models. These factors make it harder to establish causal relationships.

9.1 Avenues for Future Research

Given the relatively small sample of deals in our approach, confined by the ESG-score coverage, repeating this analysis when coverage is even better would be interesting. It can hopefully provide additional robustness to our findings. The *Corporate Sustainability*

Reporting Directive (CSRD) introduced by the EU in April 2021 might facilitate such analysis. It increases the scale of mandatory ESG reporting for large and listed firms operating in the EU[36]. Furthermore, if scoring becomes more standardized in the future, leading to greater convergence between score providers, analyses such as this one would carry more weight if scores from multiple providers were used. The CSRD initiative may potentially alleviate this issue as well. It would also be interesting to see how absolute scores (i.e., not adjusted for industry, country, or peer performance) would impact the results.

Since a potential proxy of ESG is firm culture and ethics, an interesting avenue to explore would be the integration success rate and post-acquisition performance in the context of ESG. Our study focuses on the deal itself, so the proposed approach would be an excellent complement to our findings. We have also mentioned that the costs of improving ESG performance are hard to observe, making research into this area particularly interesting.

An area that has not been the focus in our work is whether the deal would have happened if the target did not have an ESG score. Consistent with the risk of adverse selection, deals may be abandoned if information asymmetries are too high. Transparency regarding ESG initiatives might alleviate some of these asymmetries - increasing the chance of a deal taking place and reducing the risk of mispricing.

[36]The CSRD would increase the number of firms disclosing ESG information in the EU from 11 000 to 50 000, which is why we cite this as an exciting development in the context of our research.

10 Conclusion

Through our study, we have explored the effects of ESG score on M&A deal premia. We have identified a positive relationship between ESG performance and premiums, consistent with extant literature. To broaden our discussion and provide new insights on the topic, we looked closer at the specific aspects of ESG and the mechanisms which enhance or diminish the ESG effect on premiums.

We find that resource use, human rights, and management are the material contributors to the positive relationship and suggest that targets are better off focusing on these if they want to maximize the ESG-premium. We argue that these are relatively more important since resource use is more quantitative and transferable to synergy gains such as cost-reduction. Human rights help mitigate social scandal risks, and management is a valuable resource and can impose better governance mechanisms.

In our second hypothesis, we focus our discussion on why ESG might impact premiums. We find some evidence that the impact of the ESG score on premiums diminishes in deals where the information asymmetry is relatively low and deals where share payments have been used as a risk-sharing measure. We therefore argue that the positive effect of ESG on premia is partly due to these factors.

Our third hypothesis investigates whether synergies are created from the transfer of ESG capabilities. We find that when a firm merges with another with at least one quartile higher score, they increase their score by a substantial amount. Our difference-in-differences approach shows that acquirers increase their score by over seven points, while targets increase theirs by almost five points, suggesting that the transfer of ESG capabilities is possible. We also argue that this might therefore be a separate, contributing motive for M&A.

Overall, we establish a positive relationship between the ESG score of the target and the acquisition premium. Our findings also indicate that information asymmetries and risk mitigation are important drivers for this effect. Furthermore, we establish a relationship between entering into an M&A and score improvements, which we attribute to the transfer of ESG capabilities, relating to synergies. Our findings implicate that ESG capabilities are valuable and that firms may increase their sales value by improving their ESG performance.

We hope this work can shed light on why ESG impacts premiums and the specific aspects of ESG that are more relevant in determining the ESG premium - something which has not been offered much attention in extant work.

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Appendix

Table A1: **Variable Proxies and Expected Sign**

Variable	Related Theory/Proxy	Expected Sign
ESG-scores:		
Target	Disclosure	+
Acquirer	NA	?
Deal-specific Variables:		
Cross-border	Information asymmetries, cultural gains, governance	+/-
Multiple Bidders	Information cost	+
Blockhold	Information asymmetries, signal effect	-
Hostile Attitude	Use of antitakeover defenses	+
Neutral, No Applicable, Unsolicited Deal	NA	?
Cash Payment	Chance of successful integration	+
Share Payment	Risk-sharing	+/-
Industry Relatedness	Information asymmetries, antitrust risk, economies of scope and scale	+/-
Financial Variables:		
Size & Relative Deal Size	Synergy hypothesis, increased complexity	+/-
Market to Book	Growth potential, misvaluation	
Leverage	Signalling by debtors, managerial entrenchment	-
Growth	Market for corporate control, poor performance	-
Investment Rate	Synergy hypothesis	?
Analyst Following	Information Asymmetries	+/-

ESG-scores and financial variables are retrieved from Refintiv. Deal-specific variables are from SDC.

Table A2: **Correlation Matrix: All Variables**

	Deal Premium	Target ESG	Acquirer ESG	Cross-border	Multiple Bidders	Blockhold	Industry Relatedness	Cash Payment	Share Payment	Relative Deal Size	Size	MtB	Leverage	Growth	Investment Rate	Analyst Following
Deal Premium	1.00															
Target ESG	0.03	1.00														
Acquirer ESG	0.05	0.30***	1.00													
Cross-border	0.07**	0.11***	0.20***	1.00												
Multiple Bidders	0.18***	0.04	-0.04	0.01	1.00											
Blockhold	-0.13***	0.04	0.05	0.03	-0.13***	1.00										
Industry Relatedness	-0.04	0.04	0.01	0.04	-0.03	-0.16***	1.00									
Cash Payment	0.26***	0.03	0.13***	0.13***	0.12***	0.13***	-0.24***	1.00								
Share Payment	-0.18***	0.05	-0.14***	-0.16***	0.02	-0.25***	0.28***	-0.62***	1.00							
Relative Deal Size	0.25***	-0.07**	0.15***	0.01	0.02	-0.21***	0.03	0.12***	-0.03	1.00						
Size	0.03	0.35***	0.24***	0.02	0.04	-0.06	0.12***	-0.03	0.18***	0.12***	1.00					
MtB	0.05	0.03	0.10**	0.02	-0.05	-0.04	0.00	0.04	-0.04	0.34***	0.02	1.00				
Leverage	0.02	-0.01	0.01	0.01	-0.04	-0.05	-0.04	0.02	-0.02	0.06*	-0.02	0.72***	1.00			
Growth	0.00	-0.19***	-0.07	-0.01	-0.06	0.03	0.01	-0.11***	0.09**	0.06*	-0.02	-0.01	-0.03	1.00		
Investment Rate	-0.04	-0.14***	-0.09*	0.06	0.06	-0.06*	-0.02	-0.05	0.02	-0.02	-0.10***	0.00	-0.02	0.14***	1.00	
Analyst Following	-0.06*	0.36***	0.10**	0.11***	0.00	0.04	0.06	-0.04	0.08**	0.00	0.32***	0.01	-0.01	-0.06	-0.10***	1.00

Note: *p $<$ 0.1; **p $<$ 0.05; ***p $<$ 0.01.

Table A3: **Variables Names and Definitions**

Variables based on industries use the SDC industry classifications, which are based on SIC codes.

Variable Name	**Definition**	**Source**
Deal-specific Variables:		
Cross-border	1 if the deal is international	SDC
Multiple Bidders	1 if there are multiple bidders	SDC
Blockhold	1 if acquirer has a stake of 5% or more in the target, prior to announcement	SDC
Deal Attitude	Factor variable capturing the recommendation of the board or management	SDC
Cash Payment	1 if cash is used to finance the deal	SDC
Share Payment	1 if shares are used to finance the deal	SDC
Industry Relatedness	1 if the transaction parties are in related industries	SDC
Relative Deal Size	Deal value divided by total assets	SDC and Refinitiv
Financial Variables:		
Size	Natural logarithm of target's market capitalization	Refinitiv
Market to Book	Market capitalization divided by book value of equity	Refinitiv
Leverage	Book value of debt divided by book value of equity	Refinitiv
Growth	Growth in revenue the year prior to the announcement	Refinitiv
Investment Rate	Capital expenditures divided by total assets	Refinitiv
Analyst Following	1 if target is highly-followed (10 or more analysts)	Refinitiv
Fixed Effects:		
Industry Fixed Effects	Macro-industry dummies	SDC
Time Fixed Effects	Year dummies	SDC

Table A4: **Breusch-Pagan Test for Heteroskedasticity**

Model	**1**	**2**	**3**	**4**
Statistic	9.9767	7.5225	86.2665	74.6212
Parameter	11	12	43	44
P-value	0.5325	0.8212	0.0001	0.0027

Note: A p-value of $< 5\%$ indicates heteroskedasticity

Table A5: **VIF Test for Multicollinearity**

Model	**1**	**2**	**3**	**4**
Target ESG	1.0445	1.1828	1.5112	1.6706
Acquirer ESG		1.1645		1.4406
Cross-border	1.0637	1.1372	1.1323	1.2787
Multiple Bidders	1.0776	1.0987	1.1430	1.2098
Blockhold	1.1159	1.0708	1.2513	1.2154
Deal Attitude	1.1336	1.1865	1.6639	2.0701
Cash Payment	1.7327	1.5871	1.8947	1.7951
Share Payment	1.8168	1.6119	1.9851	1.8273
Industry Relatedness	1.1322	1.0629	1.2303	1.2408
Relative Deal Size			1.7179	2.3423
Ln(Target Size)			1.7280	1.9537
Market to Book			2.8174	4.0303
Leverage			2.4870	3.0771
Growth			1.1623	1.2796
Investment Rate			1.3995	1.4674
Analyst Following			1.5564	1.6424
Industry Dummies			3.3493	5.2408
Year Dummies			2.8125	4.0004

Note: Values > 10 indicate multicollinearity

Table A6: **Correlation Matrix for Total ESG and Pillar Scores**

	Target ESG	Target E	Target S	Target G	Acquirer ESG	Acquirer E	Acquirer S	Acquirer G
Target ESG	1.00							
Target E	0.84***	1.00						
Target S	0.88***	0.71***	1.00					
Target G	0.68***	0.38***	0.37***	1.00				
Acquirer ESG	0.30***	0.35***	0.27***	0.16***	1.00			
Acquirer E	0.30***	0.42***	0.27***	0.14***	0.87***	1.00		
Acquirer S	0.29***	0.33***	0.30***	0.11**	0.91***	0.77***	1.00	
Acquirer G	0.13***	0.14***	0.09*	0.15***	0.68***	0.39***	0.40***	1.00

Note: *p < 0.1; **p < 0.05; ***p < 0.01.

Table A7: **Regression Analysis Using ESG Pillar Scores**

	Dependent variable:		
	Deal Premium		
	Environmental	Social	Governance
Pillar Score	0.096*	0.112*	0.101**
	(0.053)	(0.061)	(0.051)
Cross-border	1.644	1.733	2.341
	(2.388)	(2.366)	(2.377)
Multiple Bidders	11.681***	11.436***	12.205***
	(3.773)	(3.756)	(3.789)
Blockhold	−10.024***	−9.621***	−9.200***
	(2.771)	(2.726)	(2.733)
Hostile Deal	12.281*	12.370**	12.001*
	(6.327)	(6.258)	(6.338)
Neutral Deal	−6.425	−5.186	−4.959
	(11.971)	(11.384)	(12.224)
No Applicable Attitude	−26.997***	−27.712***	−24.919***
	(7.003)	(6.802)	(6.993)
Unsolicited Deal	−2.136	−2.208	−2.298
	(3.217)	(3.287)	(3.223)
Cash Payment	11.910***	11.777***	12.439***
	(3.305)	(3.306)	(3.311)
Share Payment	−5.584*	−5.557*	−4.698
	(3.128)	(3.128)	(3.161)
Industry Relatedness	−0.537	−0.344	−0.743
	(2.299)	(2.301)	(2.322)
Relative Deal Size	3.115***	3.021***	3.138***
	(0.709)	(0.686)	(0.741)
Ln(Size)	−2.082*	−2.009*	−1.684
	(1.136)	(1.101)	(1.055)
Market to Book	−0.234	−0.237	−0.227
	(0.152)	(0.149)	(0.154)
Leverage	0.293	0.281	0.268
	(0.242)	(0.239)	(0.243)
Growth	2.729	2.788	2.742
	(1.927)	(1.933)	(1.956)
Investment Rate	−0.549**	−0.561**	−0.558**
	(0.252)	(0.251)	(0.253)
Analyst Following	−3.016	−3.116	−3.075
	(2.410)	(2.392)	(2.410)
Constant	65.171**	61.922**	51.553**
	(26.326)	(25.356)	(24.423)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	760	760	762
R^2	0.210	0.210	0.211
Adjusted R^2	0.163	0.163	0.164
Residual Std. Error	28.301 (df = 716)	28.304 (df = 716)	28.446 (df = 718)
F Statistic	4.432*** (df = 43; 716)	4.427*** (df = 43; 716)	4.468*** (df = 43; 718)

Note: *p<0.1; **p<0.05; ***p<0.01

These models are equivalent to model 3 in Hypothesis 1, but use the pillar scores instead of the total ESG score.