ESG Performance –

Effect on Acquisition Premium

A quantitative study of how ESG performance and ratio of women on the acquiror's board affects acquisition premium

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Abstract

From a target perspective we investigate how environmental, social and governance (ESG) performance affects the premium paid in acquisitions. ESG has been growing in importance during the last decade, and reporting of non-financial data is increasing. Followingly, our goal is to determine whether ESG aspects are being valued by acquirors within mergers and acquisitions. In addition, we examine how the interaction between ESG performance and gender distribution of the acquiror's board may affect the premium.

Using a sample size of 509 deals from United States and Europe, during the years 2002-2021, we find a positive effect of ESG performance on the acquisition premium. Notably, only the overall ESG score, and governance performance of the target company had a significant positive impact on the acquisition premium. The results align with the stakeholder theory, indicating that investments in ESG friendly activities are beneficial for both shareholders and stakeholders. Further on, a negative impact on the acquisition premium is found while investigating the interaction between female board directors of the acquiring company and target companies' environmental performance, indicating that when both variables coexist, it results in a lower premium paid ceteris paribus.

Keywords

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1. Background and Description

Mergers and acquisitions (M&A) play a fundamental role in financial markets for enabling business to grow, raise capital and ultimately evolve their business further (Tampakoudis & Anagnostopoulou, 2020). Underlying motive for a transaction can differ, synergy aspects could be considered, or the motive could simply be of pure financial reasons. Likewise, a potential transaction could also be a lucrative opportunity for owners of the target company. After completion a deal can be evaluated either from an acquiring or target company perspective.

In the process of a merger or acquisition, emphasis is put on making a correct valuation of the target company. All current, future, and historical aspects of the target company and the transaction in whole must be considered. More recently, non-financial aspects of businesses have been growing in importance – especially environmental and social aspects. It is today more relevant for businesses to focus on sustainability, and more firms also publish corporate social and environmental responsibility reports (King & Bartels, 2015). In connection to social and environmental responsibility, a term has been introduced that relates to Environmental, Social and Governance aspects (ESG). ESG reported data can further on be compiled and transferred into ESG scores that aims to capture all of the above aspects for a given company.

Prior research finds that Corporate Social Responsibility (CSR) is valued by acquirers within transactions and that it affects bid premiums positively (Gomes & Marsat, 2018). Moreover, Cho (2021) finds that investing in CSR activities generates value for both stakeholders and shareholders. Other than these two reports, there is not much research conducted regarding the connection between CSR/ESG and M&A. [1]

In our report an effort is made to establish how ESG scores of the target company affect valuations within transactions. Arriving at such conclusions and receiving knowledge about what causes transaction premiums can be of great value to shareholders and managers both from an acquirer and target perspective, to indicate whether having a positive environmental and social impact is worthwhile or not.

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[1] CSR and ESG are two similar measurements of sustainability. Prior literatures using CSR therefore become relevant for research papers using ESG scores (Gillan, Koch, & Starks, 2021)

2. Problem Description and Problem Analysis

Sustainability is gaining importance from economic, social, and environmental aspects. Importance of sustainability and ESG is constantly increasing and has been during the last decade. It pressures firms to invest more resources to maintain and develop a sustainable business. It can be questioned whether sustainability creates value for shareholders or not (Friedman, 1970). If no value is added for shareholders through sustainability, it could be questioned whether sustainability priorities are justified or not.

Prior studies such as Cho et al (2021) and Deng et al (2013) have to a large extent focused on analyzing deal valuations from an acquirer's point of view, which makes prior research one sided. Followingly, it makes sense for this paper to investigate transactions from a target company perspective instead. Further aspects that might impact transaction premiums can be investigated and evolved upon when a perspective of the target company is applied instead.

Moreover, studies done by Desrochers, Albert, Milfont, Kelly and Arnocky (2019) indicate that women are more prone towards caring about sustainability. To append the discussion of ESG scores and sustainability, question arises whether relationship between women and increased focus on ESG factors will hold true within deal valuations as well. More directly, acquisition premium will be regressed onto the interaction between ratio of female directors on the acquirer's board and ESG score of the target company.

To evolve upon target company perspective and establish new connections between ESG scores and acquisition premiums, this paper will examine the relationship between acquisition premiums and ESG scores of the target company. In addition, we will investigate whether board gender distribution of the acquiring company affects the acquisition premium. With our research, one will hopefully arrive to conclusions regarding how non-financial aspects such as ESG performance affects premium within deals.

2.1 Research Questions

2.1.1 How does ESG score of the target company affect the acquisition premium?

Previous literature concludes that target firm's performance within corporate social responsibility yields higher premiums for their shareholders (Cho, Han, Kim, & Kim, 2021).

Therefore, our hypothesis is that a higher ESG score similarly will affect the acquisition premium positively.

Investigation will include four different ESG scores: environmental, social, governance and total ESG score. When examining the effect of each individual sub score, they might affect the premium either positively or negatively. A target company might not have equal scores within each category and therefore the sub scores can give different effects. Although, our hypothesis is still that total ESG score has a positive effect on acquisition premium within a deal.

2.1.2 Does the interaction effect between target's ESG performance and ratio of women on the acquiror's board affect the acquisition premium?

Levi, Li and Zhang (2014) found that acquirors with more females on board, are less likely to make acquisitions and pay a smaller premium. They concluded that the reason behind smaller bid premiums is the fact that females are being less overconfident than men, and therefore does not overestimate the merger profits. In addition, Desrochers et al. (2019) argues that females possess a more pro-environmental perception and concludes that there is a robust gender difference in their attitude and behavior towards the environment.

Since women seem to care more about environmental and sustainability factors than men, one could argue that more female board directors in the acquiring firm would imply a higher premium paid for target firms with higher ESG scores. Although Levi et al. (2014) argues that female directors pay smaller premiums, this paper aims to examine the interaction effect of ESG score and female directors. The interaction term is used to investigate the effect when both high ESG scores and higher ratio of female directors coexist, and how it affects the premium paid in acquisition. The hypothesis is therefore that the interaction term will have a positive effect on the acquisition premium.

3. Aim of the Study

This study aims to investigate whether ESG score of the target company affects premium in a transaction and if any statement can be made regarding to what extent ESG performance affects acquisition premium. Using an interaction variable of ESG performance and ratio of female directors of the acquiror, we want to look into how the combination of women on the

acquirer's board and ESG performance affects premium. Furthermore, a goal and intention of this paper is to add further empirical research concerning correlation and relationship between transaction market and pricing of sustainability within M&A. Insight is added regarding how non-financial aspects of companies affects deals. Lastly, by exploring how ESG factors are affecting transaction valuations, light can hopefully be shed on how investors in general value ESG factors.

4. Theoretical Framework and Literature Review

4.1 Shareholder expense view

To investigate whether ESG score affect premium paid in transactions, one needs to distinguish who benefits from the sustainable image the firm possesses. There are two conflicting arguments, the shareholder expense view, and the stakeholder value maximization view. The shareholder expense view stresses the importance of the long-run value of the firm, while stakeholder theory emphasizes the interests of all stakeholders in a firm (Jensen, 2002).

With regards to sustainability and social responsibility, Friedman (1970) argues that sustainability costs come at the expense of the shareholders. In line with the shareholder expense view, Friedman believes that firm managers primary responsible is to please its shareholders. The directors of a firm should act in the best possible way for the shareholders, and in no one else's interests. For example, the executives might have social incentives to continue cooperating with a supplier even though it is not the best possible supplier for the business. Friedman argues that this kind of spending for general social interests is a waste of resources because it might cause a decrease in the return to the shareholders.

Following this approach, costs that benefit the social responsibility and in turn, ESG score of a firm, are seen as waste of resources that alternatively could be used to maximize firm value (Friedman, 1970). The social responsibility costs are taken to benefit the stakeholders at the expense of the shareholders. This would imply that firms who engage in activities associated with social responsibility reduce shareholder wealth. Cho et al. (2021) examines the effect of social responsibility activities on transaction premiums and can conclude that target firm's performance within corporate social responsibility (CSR) yields higher premiums, adding value for shareholders. Cho et al. also concluded that acquirers with higher CSR, achieve higher merger returns and larger increase in long-term operating performance. These results

contradict the shareholder expense view since value indeed is added for shareholders if CSR performance is higher.

4.2 Stakeholder value maximization view

In contrast to the shareholder expense view, the stakeholder theory argues that interest of all stakeholders must be considered. For example, employees want higher wages, consumers want low prices and high quality (Jensen, 2002). According to Freeman (1984), stakeholder management refers to balancing and cooperate multiple objectives and relationships at the same time. A task that is always relevant for a business.

While the shareholder expense view deem that executives are spending shareholders money when investing in social responsibilities, the stakeholder value maximization view looks at it in the opposite way. Stakeholder value maximization view claims that aligning shareholders' interest with stakeholders' interests will contribute to firm's sustainable growth (Freeman, 1984). By investing in stakeholders' interest in sustainability and social responsibility, a firm can increase their willingness to support the business.

According to the stakeholder theory and stakeholder value maximization view, firms that are engaging in social activities will increase shareholder wealth (Freeman, 1984). Aguilera-Caracuel and Guerrero-Villegas (2018) showed that not only shareholders benefit from CSR activities, but it also has a positive effect on firms' reputation. In turn, a better firm reputation will contribute to create value which benefit the shareholders as well as the stakeholders.

4.3 CSR and M&A

Previous studies have examined the effect of corporate social responsibility and sustainability on financial performance within mergers and acquisitions. Deng et al. (2013) investigate whether CSR creates value for the acquiring firm's shareholders. The authors find that stakeholder value maximization aligns well with historic data of transactions recorded in the US. It is presented how acquirers with high CSR scores receive more positive returns afterwards in comparison to acquirers which have lower scores. Furthermore, it is explained that positive long-term effects of having a high CSR score may be undervalued as long-term returns for acquirers with better CSR scores are higher in comparison to returns of those companies with a lower score. In conclusion, it is ultimately presented that CSR aspects of the

acquiring company can be an important determinator for measuring success of the merger or acquisition and their findings strengthen the stakeholder value maximization.

Gomes and Marsat (2018) examine if target's CSR performance is valued by the acquiror in a merger. One interesting finding from their studies is that the social aspects of sustainability was only valued in cross-border deals, when the target and acquiring firm are located in different countries. Further they find that higher CSR scores leads to a higher bid premium. Gomes and Marsat (2018) examines if target's CSR performance is valued by the acquiror in a merger. One interesting finding from their studies is that the social aspects of sustainability was only valued in cross-border deals, when the target and acquiring firm are located in different countries. Further they find that higher CSR scores leads to a higher bid premium. Moreover, it is stated that CSR involvement of the target company can be measured as an insurance or risk-hedge for the acquirer which adds another perspective to premiums that are being paid. Premiums could then be paid for insurance and risk reasons, instead of only paying premium for the reason of obtaining higher expected returns.

In addition, Krishnamurti et al. (2019) used Australian deals to investigate whether an acquiror's corporate social responsibility activities affect the choice of target companies, and whether these choices are assignable to its CSR score. They conclude that CSR-oriented acquirers tend to make acquisition-decisions that aligns both the interests of stakeholders and shareholders. When an acquisition decision is made public and the acquirer is CSR focused, abnormal returns are positive. Further, Krishnamurti et al. (2019) show that acquirors with CSR-focus pay lower bid premiums in acquisitions.

Previous research is in line with the stakeholder theory and shows that investments in corporate social responsibility are beneficial for both stakeholders as well as shareholders in a firm. It was shown that CSR increases shareholder wealth, along with increasing the bid premium paid in acquisitions. On this basis, further investigation will now be done to see whether ESG affects acquisition premiums and if gender distribution of the acquiror's board affect the premium.

5. Method and Data

5.1 Premium

To investigate whether ESG factors are contributing to the premium paid in a transaction, premium of a transaction must firstly be extracted. This can be measured by observing target company stock price before the acquisition is announced and then observing target stock price that has been paid by the acquirer. The percentage change in target stock price between four weeks prior to announcement and stock price paid is referred to as premium in the transaction.

Different time spans can be used to calculate transaction premium. Changing time span can change premiums significantly, which in turn would yield other results. Stock price four weeks prior to announcement is used to decrease the possibility of rumors or speculations circulating that could have an effect on the stock price. Simultaneously while using a time span of four weeks, long term trends and effects that could impact stock price are not captured. Followingly, by using this time span, we can capture the wanted effect – change in stock price that is due to the transaction at hand. When investigating transaction premiums, it is usually this time span of four weeks that is being used (Betton, 2008). Abnormalities such as wars, epidemics and other exogenous factors may also influence stock prices and thus premiums. Neither must stock price of a given security always be justified and fair. However, calculating premium according to the above procedure is deemed to best capture and reflect our sought-after effect.

$$Premium = \frac{Stock\ price\ paid\ by\ acquirer - \ Target\ stock\ price\ 4\ weeks\ prior\ to\ announcment}{Target\ stock\ price\ 4\ weeks\ prior\ to\ announcment} * 100$$

Equation 1. Premium formula

5.2 ESG Score

A crucial component for this report is ESG scores and the availability plus validity of these. For this report, ESG scores reported by Refinitiv are used. Refinitiv scores date back to 2002 (Refinitiv, 2021). Complete ESG score consists of three pillars: Environmental score, Social score, and Governance score. Pillars are individually scored and over 500 metrics are used to calculate each individual pillar score. Scores are based on company reported data - which in

turn poses a potential risk. Even if Refinitiv has a suitable method for calculating ESG scores, these would become worthless if underlying data is unreliable and uncontrolled for.

Pillar scores and the overall complete ESG score is a relative measurement of ESG performance. Thus, if a company performs relatively better than its peers from an ESG perspective, this will yield a higher ESG score. Realizing that ESG scores reported by Refinitiv are relative is a crucial takeaway to understand this report. In conclusion, scores from Refinitiv are to be viewed as percentiles, based on the following formula:

$$score = \frac{\left(no.\,of\,companies\,with\,a\,worse\,value + \frac{no.\,of\,companies\,with\,the\,same\,score\,including\,this\,one}{2}\right)}{no.\,of\,companies\,with\,a\,value}$$

Equation 2. ESG percentile calculation

5.3 Sample selection

Transaction data is firstly retrieved from Refinitiv Eikon. Only closed and completed transactions where the acquirer goes from less than 50% ownership to more than 50% in ownership are included. This ensures that there is a change of control in the target company and that the most relevant transactions are included (Gomes & Marsat, 2018). Transactions smaller than 1 million USD are excluded. Target company must be a public company, given our way of calculating deal premium using stock prices. Acquirors can be both a private and public company to maximize the sample size. As mentioned in the section where ESG scores are evolved upon, these are reported from 2002 and onwards. Followingly, transactions from 2002 up till the end of 2021 are included. Transactions from both Europe and United States are included to receive a reasonable sample size.

Result of transaction screening is afterwards compared to Refinitiv DataStream where ESG scores for each target company is retrieved. ESG score from one year prior to announcement is used since the acquisition process may begin long before announcement date, and therefore it makes sense to use an historical ESG score that the target firm already has achieved that also is observable by a potential acquirer. Lastly, the list of transactions with ESG scores included are merged with Bloomberg data to receive percentage of women on the acquiror's board. The following table gives a summary of screening criteria used:

Criteria #	Criteria
1	Only closed and completed transactions are included
2	Target company must be in Europe or the US
3	Total transaction value must be larger than 1 million USD
4	Acquirer obtains majority stake in the target company
5	Target company must be a public company
6	Transactions recorded from 2002-01-01 up to 2021-12-31 are included

Table 1. Screening Criteria

5.4 Summary Statistics of Sample

Initial screening returned a sample size of 7656 transactions. Deals without Target DataStream Identifiers were removed because adding further variables to the analysis would be impossible. After matching deals with target firm's ESG score, the sample size was reduced to 798 transactions. Then, board data of the acquiring company and data for control variables were added, and transactions that lacked required data had to be removed. In total, a sample size of 509 transactions is received. A majority of the target firms are located in the United States and operates within high technology and energy and power industries. The target firm data is summarized below in table 2 and 3.

Region	Target Frequency	Target-%
United States	362	71.12
Europe	147	28.88
Total	**509**	**100.00**

Table 2. Region of target company

Industry	Target Frequency	Target-%
High Technology	101	19.84
Energy and Power	77	15.13
Healthcare	69	13.56
Industrials	66	12.97
Materials	47	9.23
Media and Entertainment	45	8.84
Consumer Products and Services	25	4.91
Retail	25	4.91
Consumer Staples	19	3.73
Telecommunications	19	3.73
Financials	13	2.55
Real Estate	3	0.59
Total	**509**	**100.00**

Table 3. Distribution and proportion of industries within target companies

5.5 Variables Included in Regression Models

Simultaneously while fetching transaction data, data for control variables are also retrieved. Control variables included in this report are inspired by previous research done in this field, mainly by Gomes and Marsat (2018). Outliers are managed by winsorizing top and bottom 1% of variables that have significant outliers. An advantage of using the winsorized mean is that no data points are removed, it is only modified to manage the problem outliers can create (Hargrave, 2021). Winsorized variables in our regression are premium, women on board ratio, return on equity and price-to-book ratio. Leverage ratio and equity value of target company at announcement are logged since these variables had a skew distribution. In all mutations of our regression, we include year, country, and industry fixed effects to adjust for variation within each category.

Response Variable	Description
Premium	Transaction premium. Percentage change between stock price four weeks prior to announcement and stock price paid by the acquirer (see 5.1 for details)
Variables of Investigation	
Complete ESG score	ESG score of target company (see 5.2)
Environmental	Environmental score of target company (see 5.2)
Social	Social score of target company (see 5.2)
Governance	Governance score of target company (see 5.2)
Control Variables	
Cash Payment dummy	1 if acquirer paid with 100% cash, 0 otherwise
Cross Border dummy	1 if target and acquirer are located in different countries, 0 otherwise
Logged Current Liquidity ratio	Natural log of target company's current ratio
Logged Equity Value	Natural log of target company equity value at announcement
Logged Leverage Ratio	Natural log of total debt last 12 months / total assets last 12 months of target company
Price-to-Book	Target market value to target book value
Return on Equity	Target company return of equity one fiscal year prior to announcement
Runup	Target share price 1 day before announcement divided by target share price 4 weeks before announcement
Same Industry dummy	1 if target and acquirer operate in the same industry, 0 otherwise

Table 4. Description of variables included in our regression models

Variable	Mean	Median	SD	Min	Q25	Q75	Max
Premium	32.351	28.280	28.545	-31.350	14.130	46.700	129.010
ESG Score	37.525	34.190	19.030	0.690	22.490	51.000	92.590
Environmental	25.854	18.110	26.918	0.000	0.000	42.630	98.760
Social	40.291	37.340	21.066	1.140	24.290	54.280	96.270
Governance	42.738	43.870	22.304	0.580	24.350	59.650	98.370
Cash Payment	0.458	0.000	0.499	0.000	0.000	1.000	1.000
Cross border	0.340	0.000	0.474	0.000	0.000	1.000	1.000
Current Liquidity Ratio	0.446	0.428	0.676	-1.482	0.027	0.805	2.976
Log (Equity Value)	8.335	8.355	1.355	3.289	7.469	9.191	11.692
Log (Leverage Ratio)	-1.474	-1.192	1.108	-7.551	-1.704	-0.852	0.048
Price to Book	506.442	228.840	1065.778	-74.621	92.528	463.645	8159.259
Return on Equity	4.955	6.976	35.369	-156.911	0.000	15.807	159.349
Runup	1.045	1.030	0.120	0.636	0.978	1.103	1.595
Same Industry	0.644	1.000	0.479	0.000	0.000	1.000	1.000

Table 5. Summary Statistics of Variables

5.6 Model 1

Combining all variables gives the following regression model including industry fixed effect, country fixed effect, year fixed effect and an error term. This is our main regression model, called model 1. In model 1, ESG score will be substituted with each individual pillar score to investigate whether differences in individual components exist. To clarify, there will be four different versions of model one, each including only one measurement of either the total score or one of the pillar scores. Heteroscedastic robust standard errors are assumed in this model, given the distribution of residuals (see Appendix 10.2). Furthermore, model 1 includes no measurement regarding number of women on the acquirer's board. This will be covered in model 2.

$$
\begin{aligned}
Premium = {}& \beta_0 + \beta_1 ESG\ Score + \beta_2 RoE + \beta_3 \log(Leverage) + \beta_4 Price\ to\ Book + \beta_5 \log(EquityValue) \\
& + \beta_6 Runup + \beta_7 \log(CurrentRatio) + \beta_8 CashPayment + \beta_9 Crossborder \\
& + \beta_{10} SameIndustry + Industry\ fixed\ effect\ +\ Country\ fixed\ effect \\
& + Year\ fixed\ effect + \varepsilon
\end{aligned}
$$

Equation 3. Model 1

5.7 Model 2

For the second model, the sample is divided into two groups: those transactions where a private firm is the acquirer into one group, and public acquirers in the other. The reason behind the split is to collect data of the acquirers' board and examine whether gender distribution of the board affects premium in the transaction. Board data is only available for public acquirors, which is the reason behind the split. When our sample is divided, total number of deals where acquirors are public is 410, which in turn will be the sample size for part two and model 2 of our analysis. Data of board gender distribution is retrieved from Bloomberg and calculated as a ratio of the number of female directors to the total number of directors. Thus, a new variable is created named Women on board ratio (WOBR). Even if the sample for model 2 is reduced in number of transactions, this sample follows roughly the same distribution of location and industry as the full sample – dividing the sample will not cause a problem within our analysis.

	Mean	Median	SD	Min	Q25	Q75	Max
Women on board ratio (WOBR)	0.305	0.31	0.126	0	0.25	0.38	1

Table 6. Summary Statistics of women on acquirers' board-ratio

In model 2 we create interaction terms between ESG measurements and ratio of women on the acquirer's board (WOBR = Women On Board Ratio). Interaction terms are the variables of interest in this model. Similarly to model 1 where regressions are run firstly with complete ESG score and then each individual pillar scores, regressions are tried with each interaction term in model 2. Again, there will be four different versions of model two, each controlling for one interaction term. Industry, country, and year fixed effects are controlled for, and an error term is included in the regression. Heteroscedastic robust standard errors are assumed in this model as well, given the distribution of residuals (see Appendix 10.2).

$$
\begin{aligned}
Premium = \ & \beta_0 + \beta_1 Interaction\ Term + \beta_2 ESG\ Score + \ \beta_3 Women\ on\ board\ ratio + \beta_4 RoE \\
& + \beta_5 \log(Leverage) + \beta_6 Price\ to\ Book + \beta_7 \log(EquityValue) + \beta_8 Runup \\
& + \beta_9 \log(CurrentRatio) + \beta_{10} CashPayment + \beta_{11} Crossborder + \beta_{12} SameIndustry \\
& + Industry\ fixed\ effect + Country\ fixed\ effect + Year\ fixed\ effect + \varepsilon
\end{aligned}
$$

Equation 4. Model 2

6. Results

Table 5 presents summary statistics of data used in regression. Average premium paid is about 32% with a standard deviation of 28.5%. Average ESG score is about 37.5 with a median of about 34. Given that ESG scores used in this report are to be viewed as relative to its peers, it can thus be said that target companies that are collected in our sample perform under average from an ESG standpoint (Refinitiv, 2021). Additionally, some companies have a reported Environmental score of 0, while Social, Governance and complete ESG score simultaneously are non-zero.

To examine the risk of multicollinearity problem in our model, a correlation matrix is produced (see Appendix 10.1). As showcased by the provided correlation matrix, no variables have a correlation high enough to cause a multicollinearity problem within our model. Yearly, industrial and country fixed effect are included in regression models, which strengthens our results. Furthermore, a discussion concerning possible endogeneity issues is conducted later in this report (see discussion).

Moreover, a residual versus fitted plot is included in Appendix 10.2 to see the distribution of residuals. There is no clear pattern of heteroskedasticity in the residuals, however we cannot conclude the residuals to be constant. To deal with potential heteroskedasticity, robust standard errors are being used in all regressions, and is therefore no problem for our models.

6.1 Model 1

Model 1	Dependent Variable; Premium			
Main explanatory variable used	*ESG Score*	*Environmental*	*Social*	*Governance*
ESG score	0.137 (0.080)*	-	-	-
Environmental	-	0.014 (0.800)	-	-
Social	-	-	0.089 (0.185)	-
Governance	-	-	-	0.160 (0.004)***
Return on Equity	-0.051 (0.293)	-0.051 (0.294)	-0.053 (0.277)	-0.045 (0.355)
Log (Leverage Ratio)	2.092 (0.039)**	2.077 (0.038)**	2.146 (0.033)**	1.882 (0.067)*
Price to Book	-0.000 (0.759)	-0.000 (0.656)	-0.000 (0.665)	-0.000 (0.822)
Log (Equity Value)	0.764 (0.468)	1.441 (0.179)	0.961 (0.368)	1.009 (0.303)
Runup	78.105 (0.000)***	77.475 (0.000)***	77.452 (0.000)***	79.092 (0.000)***
Log (Current Liquidity Ratio)	5.743 (0.004)***	5.611 (0.006)***	5.588 (0.006)***	5.835 (0.003)***
Cash Payment	12.139 (0.000)***	11.894 (0.000)***	12.036 (0.000)***	12.174 (0.000)***
Cross Border	4.152 (0.137)	4.284 (0.126)**	4.200 (0.132)	3.950 (0.156)
Same Industry	-2.320 (0.400)	-1.995 (0.474)	-2.158 (0.438)	-2.319 (0.399)
Year Fixed Effect	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.258	0.252	0.255	0.266
No. of observations	509	509	509	509

Table 7. Regression outputs while including ESG Score, Environmental Score, Social Score and Governance Score.
*=significant at a 10% level, **=significant at a 5% level, *** =significant at a 1% level

Results from the first model are presented in table 7. The results present that a positive relationship between complete ESG score and premium can be established, but the relationship is weaker than expected. Relationship is significant at a level of 10%, whereas Gomes and Marsat (2018) find a positive relation between CSR scores and premium that is significant at a level of 1%. Our finding still aligns well with the stakeholder theory and strengthens the idea that investing in actions that increases sustainability creates value for both shareholders and stakeholders. In this scenario, it can be conducted that the economic cost for increasing ESG scores is beneficial as long as the economic value added to the premium paid exceeds investment costs. Making investments that aim to increase ESG scores are thus worthwhile for shareholders via this interpretation, if premium is expected to increase relatively more than investments would cost.

No significant relationship between environmental score, social score and premium is found. Although, a positive and highly significant relationship between governance performance and acquisition premium is found. It implies that if a target company has a higher governance score, it will result in a higher premium paid ceteris paribus. In more detail, a one percentage point increase in governance, will lead to an expected 0.16 percentage point increase in the premium. Followingly, it can be said that acquirers value governance factors such as business ethics and compliance, and indeed pay a larger premium if the company is well managed from a governance perspective. Even though positive relationships can be established between premium and both ESG score and governance, found relationships can be discussed further.

6.2 Model 2

Model 2	Dependent Variable: Premium		
Main explanatory variable used	*ESG Score x WOBR*	*Env x WOBR*	*Soc x WOBR*	*Gov x WOBR*
ESG * WOBR	-1.311 (0.064)*	-	-	-
Environmental * WOBR	-	-0.989 (0.040)**	-	-
Social * WOBR	-	-	-0.628 (0.340)	-
Governance * WOBR	-	-	-	-0.767 (0.141)
ESG Score	0.477 (0.039)**	-	-	-
Environmental	-	0.298 (0.082)*	-	-
Social	-	-	0.229 (0.270)	-
Governance	-	-	-	0.349 (0.030)**
Women on board	56.297 (0.041)**	35.171 (0.052)*	33.730 (0.248)	41.061 (0.063)*
Return on Equity	-0.072 (0.169)	-0.070 (0.174)*	-0.075 (0.147)*	-0.069 (0.192)
Log (Leverage Ratio)	2.395 (0.032)**	2.405 (0.034)	2.526 (0.023)**	2.259 (0.048)**
Price to Book	-0.000 (0.830)	-0.000 (0.780)	-0.000 (0.863)	-0.000 (0.788)
Log (Equity Value)	0.922 (0.422)	1.501 (0.196)	1.019 (0.385)	0.834 (0.429)
Runup	77.200 (0.000)***	78.807 (0.000)***	77.066 (0.000)***	78.685 (0.000)***
Log (Current Liquidity Ratio)	6.552 (0.003)***	6.531 (0.004)***	6.524 (0.004)***	6.564 (0.003)***
Cash Payment	13.736 (0.000)***	13.461 (0.000)***	13.780 (0.000)***	13.671 (0.000)***
Cross Border	1.283 (0.690)	1.112 (0.728)	1.275 (0.691)	1.490 (0.644)
Same Industry	-6.515 (0.061)	-6.625 (0.058)	-6.478 (0.066)*	-6.015 (0.087)*
Year Fixed Effect	Yes	Yes	Yes	Yes
Industry Fixed Effect	Yes	Yes	Yes	Yes
Country Fixed Effect	Yes	Yes	Yes	Yes
Adjusted R^2	0.284	0.284	0.277	0.286
No. of observations	410	410	410	410

*Table 8. Regression outputs while using interaction terms. *=significant at a 10% level, **=significant at a 5% level, *** =significant at a 1% level*

In table 8, results from our second model are presented. It is shown that the positive effect of women on board ratio is significant at a 5% level when investigating the total ESG score, and significant at a 10% level using environmental and governance performance. This implies that

a higher ratio of female directors in the acquiring company affects the acquisition premium positively ceteris paribus, in contrast of what Levi et al. (2014) concluded. Levi et al. (2014) investigates the US market while our research includes international markets. One can see that there are differences between the markets and perhaps differences in approaches between different countries exist. For example, some countries might have a view of sustainability that aligns better with the stakeholder theory, and others that aligns with the shareholder expense view. Those differences might cause different results on how female directors affect the premium in acquisitions.

The interaction variables aim to capture the incremental effect of ESG performance and women on board ratio combined. One interesting finding is that the interaction term of environmental score and women on board (see the second column in table 8) is both negative and statistically significant at 5% level. This indicates that when both variables coexist, it results in a lower premium paid ceteris paribus. In other words, when both the acquiring company has a higher ratio of women on board, and the target company perform a high environmental score, the premium paid in acquisition is lower. Similar results are found while regressing the total ESG score, however, with lower statistical significance.

7. Discussion

7.1 Model 1

Expected findings in model 1 differ from actual results. A stronger relationship between complete ESG score and premium was expected in comparison to actual output. However, an unexpected positive relationship between governance and premium was found. It could be argued that this finding aligns well with shareholder expense view if governance could be said to have a more direct effect towards shareholders. Environmental and social factors could be seen to affect the surroundings of a company to a larger degree, instead of shareholders directly. In other words, environmental and social factors could be viewed to be more connected towards stakeholders.

Moreover, it could be that social and environmental risks indirectly are reduced if a company is well governed, which could help explain the relationship found between governance and premium. With this reasoning, governance affects several aspects of a company – environmental and social aspects included. In turn, governance would then also connect to

stakeholder theory since both environmental and social aspects indirectly would be affected by how the company is governed. In conclusion, governance factors could be connected to environmental and social aspects as well as both shareholder expense view and stakeholder theory. Governing a company successfully seems key for target companies to receive a higher a valuation and therefore increasing acquisition premium both from a stakeholder and shareholder perspective.

7.2 Model 2

With regards to our second research question, the hypothesis stated that the interaction term would have a positive effect on acquisition premium. Results found show that the interaction term has a negative effect on the premium - the opposite of our hypothesis. The results were only significant for the interaction term between environmental score and women on board ratio, which indicates that a lower premium is paid for companies with higher scores of environmental performance and higher ratio of female board directors. Furthermore, the results contrasted with previous studies concerning relationship between female directors and acquisition premiums. Levi et al. (2014) showed that a higher ratio of female on board resulted in a lower bid premium, while our results indicate that a higher women on board ratio affects the premium positively. Given that we are using different markets and time spans in comparison to referenced studies, one could argue that differences in results are effects of this. Naturally, a question arises whether these differences could be due to regional attitude differences towards risk, or respectively if risk attitudes of women have changed over time. As a suggestion, it could be investigated further where differences in premium come from.

One could not see any statistically significant relationship while using social and governance scores combined with the women on board ratio, in its interactions. The interaction term coefficients were negative while we expected them to be positive. Although previous studies (Desrochers, Albert, Milfont, Kelly, & Arnocky, 2019) concluded that there are gender differences in attitude concerning the environment and that females possess a more friendly attitude against the environment, our results indicate that this is not reflected in acquisition premiums. However, results can be affected both by what market is being examined, time span, sample selection, and which ESG scores that are being used. Further discussions regarding mentioned risks are included in the following sections.

7.3 Premium

Changing the given time span used in our premium calculations might yield significantly other results. Selection and method of calculating premium is briefly discussed in our method section. However, given the importance of this variable to our report, we would like to revisit this topic.

As briefly touched upon previously, the used method of calculating transaction premiums in this report uses stock prices as foundation. A discussion can be conducted whether stock price is a valid measurement of capturing transaction premiums or not. Traders that act on deal announcements and thus influence stock prices could have made wrongful projections and assumptions. Global events could occur that influences and shocks asset prices. If this is the case, a stock price could be achieved that does not reflect true performance and outlook of a given company, and our calculated premiums would followingly be misleading. Speculation regarding stock prices is therefore a main concern for our method of calculating premium and thus our report as a whole. Speculation regarding stock prices is a discussion that stretches further beyond transaction premiums – this a fundamental concern within stock markets.

Other methods could be used for calculating transaction premium instead, where balance sheet of the target company could be the point of departure for calculating premium instead. However, due to information availability and agreed consensus in this topic of research, stock prices were used to calculate premiums.

7.4 ESG Scores

Given that the used ESG scores in this article are relative, interpretations are different compared to if measurement would be absolute. Calculating an absolute measurement seems difficult, and several problematics arise if such a measurement was to be introduced. Furthermore, several problematics seem to exist when trying to measure ESG performance.

No general requirement of publishing ESG data seem to exist. Whether reporting ESG data is mandatory or not may also differ across nations which further complicates ESG reporting and its availability - especially for multi-national companies. A unified mandatory international ESG reporting system would increase comparability and hopefully quality of measurements. Naturally, arriving at such international systems can be hard.

Firstly, demand of ESG reporting may differ across borders. If investors do not seek ESG performance data, reporting it would be useless. Secondly, prerequisites and resources for nations to introduce and apply such a reporting system may differ. Nations more focused towards exporting services compared to nations who are more focused towards exporting commodities and goods might prioritize differently. Thirdly, unifying a system and standardizing measurements across sectors and nations would require an extensive framework. Creating such a framework would most likely be a costly process. Nations and policy makers might choose to invest in other areas that have more direct impact. To conduct more comprehensive investigations and arrive at further conclusions, data availability of ESG performance must increase. As time passes, ESG data available to researchers and investors will increase, which in turn means that further analysis concerning ESG performance can be conducted in a near future.

In conclusion, procedure of reporting ESG data must be improved, and a unified system must be applied to enable the academic world to investigate further relationships between ESG and economic factors. Continuing the initial discussion of shareholder and stakeholder maximization theory, it seems to us that more and more firms realize that increased ESG performance may be positive for development of the firm and to its shareholders as well.

7.5 Data sampled in this paper

Given that we first arrived at a sample size of about 7 500 companies and later arrive at a final sample size of 509 companies, a discussion of data availability is justified. Initially, many transactions were removed as ESG scores were added since only roughly 600 target companies out of the 7 500 deals had ESG scores available at the requested time. Availability of ESG score is discussed in a separate paragraph. Moreover, some deals were removed where companies lacked basic financial information such as total debt. Lack of such basic financial information may raise red flags and concern. If basic financial data is missing and unretrievable, validity of other data points could be questioned as well.

Moreover, selection bias can potentially be a problem if the sample is not randomly selected. One could possibly argue that the process of a company receiving an ESG score is non-random, and therefore this could potentially cause a selection bias. Given that we only have

included deals where the target company had received an ESG score at the requested time, there is a risk of selection bias within the results. Also, a possibility of error within our sample is created when we use multiple databases to link data together. However, even if the risk of selection bias is noticeable, we decided to go through with our chosen method since this still was the most viable method at hand.

Worth noticing is the choice of control variables, which were inspired by previous research. It is possible that other more viable control variables exist that control for other aspects within businesses, and that these should have been included in our analysis. Anyhow, the used control variables deem to be deal characteristics that are essential when investigating acquisition premium.

Furthermore, some companies had a reported Environmental score of zero, while other pillar scores for the same company were reported non-zero. These companies were still included in our analysis since these were official reported scores. Given that other pillar scores were non-zero and official, it made to sense to include these. Excluding such Environmental scores and companies could have caused a bias problem. Simultaneously, another problem might exist currently when Environmental scores of zero are included. Our regressions that use Environmental scores might be negatively skewed, and true effect of Environmental score might not be captured. In further analysis, an additional model could have been tried where companies of a reported Environmental score of zero are excluded.

7.6 Endogeneity problem

There is a risk of endogeneity problems within our results, which is not handled in the report due to time constraints. A common way to handle endogeneity problems is to use an instrumental variable as a proxy for ESG score. Cheng et al. (2014), Arouri & Pijourlet (2017), and Gomes and Marsat (2018) are using the country-year and country-industry mean of CSR scores as proxies for corporate social responsibility scores. Then instrumental variable regression is used to show that the results do not suffer from endogeneity issues. If more time were to be available, we would have liked to perform an instrumental variable regression to test our results further and receive further robustness to the results.

7.7 Further research

To reach a more comprehensive view concerning ESG reporting, it would be interesting to investigate status and progress of sustainability reporting more thoroughly. It would moreover be interesting to track development and progress of non-financial metrics within target companies over time. In our paper, ESG scores at one timepoint is included (one year before announcement) but one could also examine development of these scores after acquisition to track if scores tend to change after transactions. Further on, it could be investigated whether ESG factors are being more valued during recent years or not. Since we are investigating deals made from 2002 up to 2021, this would be a relevant analysis for our research as well. For academics to investigate further relationships between non-financial metrics and economic factors, ESG data availability and validity must firstly increase.

Continuing our discussion from section 7.2, an additional suggestion for further research is to investigate if there are differences between regions in how ESG performance is valued and prioritized. Non-financial data might differ in importance between regions and general perception of ESG might differ between cultures.

8. Conclusion

Via our results, it is showcased that ESG performance is valued by acquirers and that better ESG performance results in a higher premium paid in acquisition which is in line with both prior research and our expectations. Moreover, we show that the governance factor independently is valued by acquirors. A potential explanation for the strong relationship between governance and premium could be that governance influences multiple aspects of a business – including social and environmental factors. Further, while investigating the interaction between number of female directors and ESG performance we find a negative relationship which indicates that the premium is lower for target companies with higher ESG scores and acquirors with a higher ratio of women on board. The negative relationship holds true for the interaction between the environmental performance and female board director as well.

Our findings bring further discussion and knowledge concerning premiums within M&A and its relationship to sustainability. From an industry perspective, receiving more knowledge regarding what increases premium in a transaction is of great value. Lastly, it could be explored further how reporting of the ESG data is progressing. For researchers to reach additional insight concerning economic factors and its relationship to non-financial performance, data of sustainability must firstly increase.

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10. Appendix

10.1 Correlation matrix

	Premium	ESG Score	Environmental	Social	Governance	Women on Board	Return on Equity	Log(Leverage Ratio)	Price to Book	Log(Equity Value)	Runup	Log(Current Liquidity Ratio)	Cash Payment	Cross border	Same Industry
Premium	1.000														
ESG Score	0.005	1.000													
Environmental	-0.059	0.856	1.000												
Social	0.030	0.885	0.727	1.000											
Governance	0.033	0.692	0.430	0.378	1.000										
Women on Board	0.002	0.125	0.129	0.134	0.045	1.000									
Return on Equity	-0.091	0.018	0.049	0.044	-0.053	0.074	1.000								
Log(Leverage Ratio)	0.003	-0.053	-0.042	-0.097	0.015	-0.085	-0.029	1.000							
Price to Book	0.074	-0.078	-0.136	-0.034	-0.066	0.012	-0.030	0.115	1.000						
Log(Equity Value)	-0.027	0.398	0.373	0.391	0.214	0.103	0.012	0.037	0.024	1.000					
Runup	0.335	-0.065	-0.106	-0.026	-0.084	-0.056	0.059	-0.013	0.108	-0.086	1.000				
Log(Current Liquidity Ratio)	0.209	-0.147	-0.195	-0.063	-0.120	0.016	-0.004	-0.270	-0.034	-0.109	0.099	1.000			
Cash Payment	0.256	-0.119	-0.114	-0.093	-0.076	0.039	0.041	-0.042	0.056	-0.131	0.025	0.120	1.000		
Cross border	0.117	0.122	0.107	0.108	0.099	0.112	-0.089	0.017	0.065	0.118	-0.025	-0.053	0.202	1.000	
Same Industry	-0.040	0.083	0.101	0.093	0.027	0.018	0.071	0.044	-0.055	0.153	0.039	-0.008	-0.029	0.005	1.000

10.2 Residual vs fitted plot