Impact of Targets' ESG Scores on M&A Takeover Premiums

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Abstract

Environmental, Social, and Governance considerations are becoming more prominent for both society and the corporate world, as sustainability, ethical, and climate concerns increase. With this increase in relevance, in the context of Mergers & Acquisitions (M&A), are acquiror firms committed to incorporating targets' ESG practices to the point where takeover premiums are affected? This is the proposed research for this dissertation. As regulatory conditions and risk perceptions aren't universal, for secondary research topics we also analyze if the impact targets' ESG scores have on premiums varies with industries and regions. The approach for the analysis was regression models, through which we concluded that targets' ESG scores significantly and positively impact premiums paid by acquirors overall. As exceptions, we found that in some industries and regions, increases in targets' ESG scores are not associated with an increase in the takeover premium.

Title: Impact of Targets' ESG Scores on M&A Takeover Premiums

Keywords: ESG scores, M&A, Takeover Premium

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Resumo

Considerações nos âmbitos Ambiental, Social e de Governação (ESG) têm crescido em proeminência tanto para a sociedade como para o mundo corporativo, à medida que a preocupação com questões de sustentabilidade, ética e clima aumentam. Com este crescimento em relevância, no contexto de Fusões & Aquisições (M&A), estarão as empresas adquirentes empenhadas em incorporar as práticas de ESG das empresas-alvo, ao ponto de influenciar o premium de aquisição pago? Este é o tema de estudo proposto nesta tese. Uma vez que as condições regulamentais e as perceções de risco não são universais, como temas de pesquisa secundários também é analisado se o impacto que as pontuações de ESG das empresas-alvo têm no premium pago varia entre indústrias e regiões. A abordagem para esta análise teve na base modelos de regressão, através dos quais foi possível concluir que as pontuações de ESG das empresas-alvo têm, no geral, um impacto significante e positivo no premium pago pelas empresas adquirentes. Como exceções, concluiu-se ainda que em algumas indústrias e regiões, aumentos nas pontuações de ESG não estão associadas ao aumento do premium negociado.

Título: Impacto das Pontuações de ESG de Empresas-Alvo no Premium Pago em M&As

Palavras-chave: Pontuações ESG, M&A, Premium de Aquisição

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1. Introduction

Environmental, Social, and Governance (ESG) concerns have become increasingly relevant in society and the corporate world. As these considerations grow in prominence, they have become a part of investors' processes, influencing their decision-making (Duuren et al., 2015). Not only that, but investors have also started to demand firms to engage in and disclose this information (Ilhan et al., 2023). Alongside ESG's growth in relevance, regulations regarding this topic (such as better in-work practices and carbon emissions limits) have generally increased and become stricter. As with any regulation, ESG regulations affect nations and industries differently, given that the legal environment is nation-specific and can affect different industries differently, as the integration of external shocks varies between them (Mitchell & Mulherin, 1996).

As these regulations and ESG concerns increase, so does ESG disclosure and ESG investing, which can be beneficial for the overall markets (Krueger et al., 2021) and can lead to lower firm risk (Giese et al., 2019) and high abnormal returns (Kempf & Osthoff, 2007). With this environment set, this study intends to answer mainly three research questions, stated in Section 1.1., to understand if ESG is enough looked for so that it affects the premium acquirors pay. The results confirm that ESG considerations positively impact the takeover premium overall, reflecting investors' willingness to increase the premium paid because of ESG matters, and showing their commitment to absorb better environmental, social, and governance practices and the potential benefits from ESG investing.

The remainder of the dissertation is structured as follows: Section 2 presents the literature review, Section 3 proceeds with the data retrieval and lays out the chosen methodology to approach the research questions, Section 4 shows the results, Section 5 presents the robustness checks performed, and Section 6 states the main conclusions.

1.1. Research Questions

For the 1st research question, the goal is to see if, with all the studied benefits ESG brings, the overall targets' ESG score impacts the premium paid by acquirors. For that, we'll answer the following question – "Does the targets' ESG performance impact the takeover premium?". For the 2nd and 3rd research questions, we explore the idea that regulations and external shocks may impact different nations and industries differently. To analyze if targets' ESG scores have different impacts on premiums across industries and acquirors' regions, we'll answer the questions - "Does the impact that targets' ESG performance has on premiums vary between

industries?", and "Does the impact that targets' ESG performance has on premiums vary between acquirors' regions?".

2. Literature Review

The analyzed literature is divided into three subsections: Section 2.1. discusses M&As and the motives behind them, Section 2.2. explores ESG considerations, and Section 2.3. focuses on the M&A takeover premium.

2.1. M&As and Motives Behind These Transactions

Mergers & Acquisitions refer to transactions in which the acquiror purchases or merges with a given target hoping to gain control over it, gain new resources, and/or expand into new markets or businesses. Taking various formats, from horizontal and vertical mergers to hostile and friendly takeovers, and tender offers, M&As are driven by a range of motives.

Concepts such as the monopoly theory, the valuation theory, the empire-building theory, and the efficiency theory have been explored as potential motivations behind M&As (Trautwein, 1990). Specifically, the efficiency theory refers to mergers and acquisitions projected to reach financial, operational, and/or managerial synergies, which happen when the combined value of the acquiror and target is greater than the sum of their separate parts. Those synergies can be achieved through lower cost of capital, lower general costs through joint forces and knowledge sharing, and better planning. Theories regarding deals targeting to achieve synergies have received criticism for not always holding up. However, in later literature, Berkovitch & Narayanan (1993) state that synergies are the main reason for mergers, and Damodaran (2005) states that while synergies rarely materialize due to overpaying or lack of planning, there is, in fact, potential and evidence of them.

While this increased value creation is the main aspect that firms aim to achieve in an M&A deal, there are other factors driving these transactions. External forces like regulatory changes, technological developments, and economic shocks also influence M&A activity. These shocks often influence firms within the same industry in very similar ways, making them engage in takeovers relatively within the same period (Mitchell & Mulherin, 1996). What the authors found was that, during the 80s, half of the takeovers happened in a fourth of the period. Not only that, but they also stated that the rate of takeovers varies depending on how the shock was

felt and embedded from industry to industry, this is, there is an interindustry variation. For instance, if technological developments (that may impact different industries differently) are equally looked for by firms within an industry, that shock may lead them to acquire other firms almost simultaneously, so they absorb those new technological capabilities. The notion that firms respond to external shocks to adapt to the changing market has later been reinforced by Harford (2005) where it is also stated that unusually high M&A activity, also known as merger waves, is caused by economic, technological, or regulatory shocks.

2.2. Sustainability and Environmental, Social, and Governance Considerations

Examples of regulatory shocks that follow the ever-growing topics of sustainability include sustainability reports and mandatory disclosure of the Environmental, Social, and Governance pillars, which are meant to evaluate a company's practices on topics of sustainability and ethics. The Environmental pillar includes aspects to do with carbon emissions, land use, deforestation, and pollution, among others. The Social pillar touches upon subjects related to labor practices, how companies manage their employees, and product quality, and the Governance pillar has to do with shareholder rights, manager compensation, and board diversity.

While ESG considerations have become increasingly relevant for investment decision-making, this information isn't always available. By requiring mandatory ESG activity disclosure, both through global and country-level efforts, the corporate information environment improves, and capital markets benefit through increased liquidity (Krueger et al., 2021). This can ultimately push other countries to adopt ESG-related regulations, which contribute to more informed investing decisions.

Following the increased prominence of sustainability considerations, it has been found that investors not only value but also demand climate-related disclosures (Ilhan et al., 2023). This finding strengthens what had been studied before by Duuren et al. (2015), where it is shown that Socially Responsible Investment (SRI) is already part of managers' investment practices. The perceived benefits of SRI and ESG investing, however, vary across geographies, mainly across the US and Europe. Whereas the US tends to be less optimistic about the impact of ESG investing on the financial outcome, Europe places SRI and ESG investments closer to fundamental investment.

Similarly to the motivations behind engaging in an M&A deal, motivations behind ESG investing can also vary. Starks (2023) established an important distinction between value and values. ESG-related investments can either be driven by the financial value intended to be acquired through the risk/return relationship (value), or by non-monetary values, through investing in firms that mirror the acquiror's values, be they related to child labor, religious beliefs, carbon footprints, or animal harm (values). Whether motivated by financial value, whether motivated by nonpecuniary values, literature has shown that investing in firms with ESG-related concerns can be beneficial for the investor in different ways. These benefits, which are mentioned below, can encourage bidders to increase their investment in firms with sustainability and ESG concerns and practices.

Regarding the impacts that ESG investing has on equity valuation, risk, and performance, Giese et al. (2019) show that it contributes to lowering both systematic and idiosyncratic risk, by providing lower cost of capital and higher valuation, and higher profitability and lower exposure to tail risk, respectively. This ESG risk reduction effect has been proven to be a good investment signal as it is long-lasting, continuing for 3 years after an ESG scoring upgrade. In another study, Aktas et al. (2011) also showed how SRI benefits shareholders. Not only do the acquiror gains improve when the target within the M&A transaction has a better capacity to deal with ESG risks (through ESG-implemented practices), but there are also more synergistic gains when the target has a better environmental performance. This idea is linked with a previous study by Kempf & Osthoff (2007), where, by applying a strategy of buying stocks with high socially responsible ratings and selling stocks with low socially responsible ratings, they reach high abnormal returns of up to 8.7% per year. Within the SRI field, Corporate Social Responsibility (CSR) also has its impact (Hill et al., 2007). The authors established that CSR contributes to long-term financially successful performance. However, only firms willing to meet the rigid CSR standards will be able to achieve that successful performance. Like Duuren et al. (2015) came to conclude, Hill et al. (2007) also stated that cultural differences influence the value investors from different regions place on CSR factors – European firms are the only ones in the study valuing CSR both in the short and long term.

If not through decreasing a firm's risk or through improving acquiror and synergistic gains, adopting sustainable or ESG standards can help a firm build and increase its reputation by implementing responsible practices. These practices will contribute to avoiding controversies and the negative financial consequences that come with them (Nirino et al., 2021).

2.3. M&A Takeover Premium

As mentioned previously, several benefits can come when engaging in an M&A deal, namely synergies, and a good strategic fit between two firms, that arises from external shocks like technological advancements. Because of these potential benefits, many acquirors are willing to pay an extra, the so-called takeover premium, for a target with specific and appealing characteristics. Previous literature has studied what impacts and determines these premiums.

Cultural differences are known to affect relationships between people, society, and firms. Lim et al. (2016) studied them in a corporate environment and found that cultural distance (CD) impacts the M&A premium paid, although in an asymmetric manner. This is, the way that CD impacts the takeover premium depends on how the CD is perceived by the acquiror. In their study, the authors state that while CD has a negative relationship with premiums when US firms are the acquirors, when the opposite happens and foreign firms acquire US firms, that negative impact is not observed. Whereas US firms perceive a harder integration and a higher risk, therefore paying a lower premium, foreign firms are more familiar with the American culture, less affected by those cultural differences, and do not significantly lower the premium.

Also proven to affect the M&A takeover premium are latent competition and anticipated auction costs, studied by Aktas et al. (2010). The authors find that premium increases with the latent competition – as under the threat of other bidders joining, they are willing to offer a higher premium – and decreases with targets facing higher auction costs like high debt ratios. Besides, the study also looks at the form of payment and concludes that premiums tend to be higher with cash payments and lower with stock. Looking at what drives larger premiums Dimopoulos & Sacchetto (2014) mainly identify two factors. Firstly, they look at pre-emptive bidding, where acquirors offer a higher initial bid, and, therefore, a higher premium, to discourage and put off other potential bidders. Secondly, they mention target resistance – for a bidder to secure the acquisition, and so that it combats the target's resistance, a higher premium may have to be placed. Furthermore, factors like deal size and target size have also been identified as determinants of premium – the larger the target, the larger the perceived complexity and the lower the premium acquirors are willing to offer (Alexandridis et al., 2013).

As sustainability and ESG concerns become more prominent and mainstream, and with the proven benefits and advantages that ESG performance brings, I propose to analyze whether these considerations are or aren't enough searched so that acquirors are willing to pay a takeover premium because of them.

3. Data and Methodology

3.1. Data

The M&A deals data was retrieved from the Deal Screener on Refinitiv Workspace. After the 2006 United Nations' Principles for Responsible Investment, there was a general push for ESG practices and disclosure to be more incorporated into investors' decision-making. The period analyzed starts after these principles were introduced, going from deals announced between the 1st of January 2010 and the 31st of December 2023. Only completed deals were considered and no impositions were made on the target or acquiror's nation, making the initial sample of 600,268 deals. This sample was then reduced to 7,134 by requiring that both the target and the acquiror be public and that the percentage of shares owned after the transaction was greater than 50% so there is the notion of gaining control over the company after the deal took place.

Finally, following Faias (2017), a series of filters were applied to exclude deals that did not fit the intended M&A deal characteristics. Those filters excluded liquidations, restructurings, bankruptcies, leveraged buyouts, reverse takeovers, privatizations, and deals whose acquisition was going private, making the final sample comprised of 6,004 deals. Many of these deals have goals such as buying assets at a discount and gaining access to public markets, which differ significantly from ESG-related strategies and the strategic fit looked out for in typical M&A transactions. As we want to analyze whether ESG considerations are valued by the acquirors and whether they see a strategic fit worth paying a premium for, we excluded those deals.

Having the 6,004 deals, some variables were added to have all the information necessary for the analysis, starting with the dependent variable, the premium negotiated, which is expressed as the premium of the offer price to target closing stock price 4 weeks prior to the announcement date. The remaining variables needed for the study include the acquiror and target nations, The Refinitiv Business Classification (TRBC) industry groups for the targets, the target's CUSIP, the acquiror and target market value (calculated by multiplying the total number of the acquiror/target shares outstanding by the closing stock price 4 weeks before the announcement), the target's EBITDA margin, deal value, deal attitude, number of bidders, tender offer flag and final consideration structure. Since not all the previously mentioned variables successfully returned information for the 6,004 deals, cleaning the data was necessary for blank or NULL cells and for duplicate deals, leaving the M&A deals sample with 2,739 transactions. Among these 2,739 deals, there were targets from 11 industries, which are divided into more than 50 TRBC groups overall, as displayed in Table 1.

Table 1 – TRBC Industry Groups

This table shows how each of the 11 industries in the 2,379-deals sample is divided into TRBC industry groups, as retrieved from Refinitiv Workspace Deal Screener.

Industry	TRBC Group
Energy	Oil & Gas Related Equipment and Services Renewable Energy Oil & Gas Coal Uranium
Utilities	Multiline Utilities Electric Utilities & IPPs Water & Related Utilities Natural Gas Utilities
Consumer Cyclicals	Diversified Retail Textiles & Apparel Homebuilding & Construction Supplies Automobiles & Auto Parts Specialty Retailers Household Goods Leisure Products Hotels & Entertainment Services Media & Publishing
Technology	Office Equipment Telecommunications Services Computers, Phones & Household Electronics Semiconductors & Semiconductor Equipment Communications & Networking Electronic Equipment & Parts Software & IT Services Financial Technology (Fintech) & Infrastructure Integrated Hardware & Software
Academic & Educational Services	Schools, Colleges & Universities Professional & Business Education Miscellaneous Educational Service Providers
Healthcare	Healthcare Providers & Services Pharmaceuticals Healthcare Equipment & Supplies Biotechnology & Medical Research
Basic Materials	Containers & Packaging Chemicals Construction Materials Paper & Forest Products Metals & Mining
Consumer Non-Cyclicals	Personal & Household Products & Services Beverages Food & Drug Retailing Food & Tobacco Consumer Goods Conglomerates
Financials	Insurance Banking Services Investment Banking & Investment Services Investment Holding Companies Collective Investments
Industrials	Machinery, Tools, Heavy Vehicles, Trains & Ships Passenger Transportation Services Transport Infrastructure Professional & Commercial Services Diversified Industrial Goods Wholesale Freight & Logistics Services Construction & Engineering Aerospace & Defense
Real Estate	Residential & Commercial REITs Real Estate Operations

Source: Refinitiv Workspace and Author's Computation

The next step in the data retrieval process was regarding the ESG and CSR information. Retrieved from Refinitiv Workspace, several scores were considered both at a firm (using the target's CUSIP and RIC codes) and industry level: ESG, E, S, and G separately, as well as CSR Strategy, CSR Sustainability Committee, and CSR Sustainability Reporting. For the computation of the ESG scores, Refinitiv follows the LSEG methodology in which each of the three components is weighed differently across TRBC industry groups. Environmental scores account for emissions, resource use, and innovation, Social scores consider community, human rights, product responsibility, and workforce matters, and Governance scores address topics related to shareholders, CSR strategy, and management. Regarding the CSR scores, CSR Strategy evaluates a firm's practices to communicate that it integrates economic, social, and environmental dimensions into its day-to-day processes, CSR Sustainability Committee scores assess whether a firm has a committee responsible for implementing CSR-related decisions, and CSR Sustainability Reporting gages if, and how, firms have a specific publication or report in their annual reports that addresses CSR and sustainability topics.

Out of the 2,739 targets from the clean transactions sample, it was possible to retrieve firm-level ESG and CSR data for 649 of them – Table 2 shows how the deals per industry changed when merging the ESG and CSR data. Of the 11 industries represented, Academic &

Educational Services only has one deal out of the 649 deals remaining. Given this minimal expression, that observation was dropped, leaving 648 deals in the final sample (roughly 24% of the cleaned M&A 2,739-deals sample). To understand how these 648 deals are distributed across industries and years, refer to Appendix 1.

Looking further at Table 2, we can see that the industry with the biggest percentage remaining was Utilities, with 45% of deals left after the sample merger. This can indicate a higher ESG transparency among firms in this industry. Apart from Academic & Educational Services, the remaining 9 industries have similar percentage drops, signaling similar disclosure practices implemented. If analyzed year by year, the overall trend is for the percentage of deals remaining after the sample merger to increase, meaning that fewer firms were filtered out for not disclosing ESG information as the years went by (in percentage terms). This seems to follow the trend of increased regulation and the growth of investors' demand for firms disclosing ESG information (Ilhan et al., 2023). Further ahead is shown how the descriptive statistics changed after the merging of the samples.

Table 2 – Sample comparison before and after merging with ESG data

This table looks at the 11 industries in the transactions sample and shows how the retrieved ESG and CSR data changed it, going from 2,739 to 649 deals. The second and third columns show the number of transactions for each of the industries before and after the merge, and the final column shows the percentage of deals left after the ESG and CSR data was integrated.

Industry	Deals Before (N)	Deals After (N)	% Remaining
Utilities	69	31	45%
Energy	230	62	27%
Basic Materials	261	66	25%
Financials	471	118	25%
Healthcare	197	47	24%
Technology	432	98	23%
Real Estate	164	37	23%
Consumer Cyclicals	354	77	22%
Industrials	388	79	20%
Consumer Non-Cyclicals	165	33	20%
Academic & Educational Services	8	1	13%

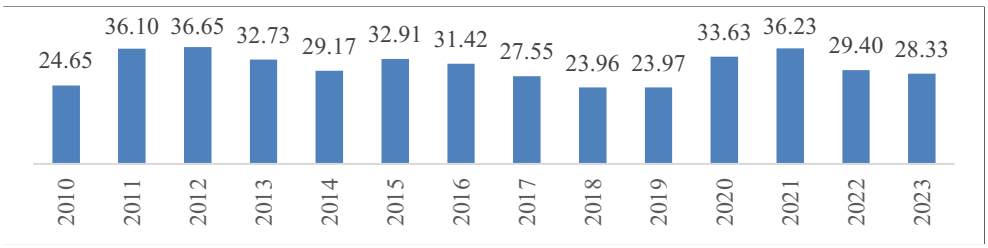
Source: Refinitiv Workspace and Author's Computation

Taking the final sample, we looked at the evolution of the average premium paid (expressed as a percentage), illustrated in Figure 1. In 2010 (24.65%) the third-lowest average premium was registered, which may be linked to the aftermath of the 2008 global financial crisis. During tighter economic and credit conditions, it is likely that investors are more guarded when

negotiating the premium. After 2010, with markets beginning to stabilize and with both European and US interest rates on a declining trend (Statista, n.d.), there was a rise in the average premium paid until 2012, when the highest average premium (36.65%) was registered. In mid-November 2012 the US presidential elections took place, leading to higher uncertainty on the policies that would be implemented and to a change in investor sentiment, factors that may explain the drop felt in 2013 (32.73%). Even though the presidential election shock began to settle, 2014 (29.17%) was marked by the Ukraine conflict where Russia forcibly annexed Crimea. This again impacted global markets and increased the sense of uncertainty, likely increasing the investors' cautiousness. Between 2015 and 2018, the average premium followed a declining trend, going from 32.91% in 2015 to the minimum value of 23.96% in 2018. This period included times of high uncertainty with the 2016 US presidential elections and Brexit, events that may have caused investors to be more prudent. In 2019 the second-lowest average value was recorded (23.97%), potentially due to increased wariness both because of the increased tensions of the US-China trade war and because the world's GDP had been relatively constant since 2012 (World Bank Group, n.d.), which may be received as a signal that economic growth is reaching its peak, therefore making investors more cautious. In 2020 (33.63%) and 2021 (36.23%), with the COVID-19 pandemic hitting, and even though global GDP took the largest dip since 2009 (World Bank Group, n.d.), average premiums increased relative to 2019. This may be explained by two factors going hand-in-hand: there was increased liquidity in the markets, injected by governments worldwide, and investors may have felt the need to answer quickly to the changing conditions, so they adapted to remain competitive in tougher times. Both these factors may have led investors to be willing to pay high(er) premiums. In 2022 (29.40%) and 2023 (28.33%), with the world's GDP taking another dip (World Bank Group, n.d.), with US and European interest rates being the highest they had been since before the 2008 financial crisis (Statista, n.d.), with government aid no longer taking place, and with the adaptation to COVID-19 beginning to relativize, average premiums paid decreased.

Figure 1 – Takeover Premium Evolution

Based on the final 648-deals sample, this graph shows how the average takeover premium paid (in percentage terms) evolved throughout the years.



Source: Refinitiv Workspace and Author's Computation

3.2. Descriptive Statistics

With the industry-level data extracted from Refinitiv Workspace, it was possible to see how the ESG and CSR median scores have been evolving throughout the years for each of the industries within the final sample. This evolution is shown in Table 3. Looking at Panel A, it is visible that from 2009 to 2023 all industries increased their ESG median score, suggesting progress in firms' ability to implement better practices, following the increased regulation and the growth in investors' demand for firms disclosing this information (Ilhan et al., 2023). Utilities was the only industry remaining green through the years, registering the highest ESG median in 2023 (50.17), Real Estate was the industry with the greater median growth from 2009 (29.59) to 2023 (47.47), and Healthcare was the industry whose 2023 value (36.24) is closest to the 2009 value (36.18), indicating a relatively constant evolution trend overall. This constant evolution trend led to Healthcare being the industry with the lowest median value for 2023. When looking separately at each of the ESG components in panels B, C, and D, only for the Social pillar did all industries register an increase in median values from 2009 to 2023, with Basic Materials having the biggest growth and Real Estate having the maximum median value for 2023 (49.33). For the Environmental pillar, the only industry registering a decrease in its median value (2009 vs 2023) was Healthcare (22.11 vs 13.45), with all other industries growing their median, especially Real Estate, which had the biggest growth (9.03 vs 44.09). For the Governance pillar, Healthcare (48.90 vs 43.13), Technology (52.31 vs 48.56), and Utilities (60.38 vs 55.16) all saw a decline in their median scores, with Real Estate once again registering the maximum growth (39.94 vs 50.38). Overall, it is on the G-score component that industries register higher average medians for all years. Still in Table 3, but looking at panels E, F, and G, the trend is also for CSR median scores to increase between 2009 and 2023. The only exceptions to this trend are Basic Materials, Consumer Non-Cyclicals, and Utilities, with lower median values for CSR Sustainability Reporting in 2023. Something significantly differing from the previous panels, is the presence of medians with the value of 0. This means that many firms publicly displaying information are still not engaging in, for example, reporting practices. In the cases where in 2023 there are still medians equaling 0 (for example Healthcare and Technology), this doesn't necessarily reflect a decrease in CSR scores for all firms within that industry, but an increase in firms publicly sharing that information and entering with a base score of zero.

Having the industry median benchmarks was important to understand how the ESG scores from the targets within the final sample were distributed. Table 4 illustrates the average ESG scores per industry and year, from the 648-deals sample. After analyzing the targets' ESG scores by

deal, it is possible to conclude that the final sample is relatively equally distributed – around 50% of the targets have ESG scores equal to or above their industry median, and around 50% of the targets have ESG scores below their industry median. The industries with the higher number of targets with ESG scores placing equal to or above their industry median values are Industrials, Consumer Cyclicals, Healthcare, and Utilities. The years in which most of the targets' ESG scores placed equal to or above the industry median were 2014, 2021, and 2022.

To understand how the ESG and CSR independent variables from the final sample were correlated, a correlation matrix is shown in Table 5. As expected, E, S, and G scores are highly correlated with the overall ESG score with correlations of 0.85, 0.80, and 0.70, respectively. Also highly correlated, with a coefficient of 0.71, are the E and S scores, meaning that when one score tends to be higher, so does the other. Also with high correlation coefficients are CSR Strategy with ESG (0.71) and E (0.76) scores, and CSR Reporting with E (0.71) and CSR Strategy (0.82) scores. The correlations between the other scores' interactions are either moderate or low, indicating a weaker relation.

In Table 6 several target and deal characteristics are displayed for each of the 10 industries within the final sample. Panel A displays the takeover premium, expressed both in percentage and dollar terms (calculated by multiplying the premium percentage with the target's market value), the deal value ($ million), the target and acquiror size ($ million), and the target's EBITDA margin. Panel B shows the proportion of deals that were tender offers, paid solely with cash, and between acquirors and targets from different nations. These three characteristics are represented in three dummy variables – Tender Offer, Cash Payment, and Cross Border – that equal 1 when the condition is true.

Looking at Panel A, Technology, which has an average target size of $7,098 million, is the industry with the highest average premium both in percentage (38.98%) and dollar terms ($3,368 million). On the other hand, while Industrials registers the second-highest average percentage premium (38.81%), the fact that it has the fourth-lowest average target size ($5,068 million) explains why this industry only registers an average premium (in dollars amount) of $1,554 million. With the minimum premium in percentage (19.90%) and dollar terms ($720 million), Real Estate has the second-lowest average target size ($3,955 million). Although not registering the highest values for average premium (in $ million) given the smaller premium percentages, Consumer Non-Cyclicals and Healthcare have the largest targets, with size averages of $11,265 million and $10,745 million, respectively, which explains the highest deal

values of $12,869 million and $14,099 million, correspondingly. Similarly, Financials and Real Estate, with the lowest average premiums and target sizes, also register the lowest deal values of $3,507 million and $3,973 million, respectively. When it comes to the acquiror size, Technology ($87,004 million), Healthcare ($62,425 million), and Consumer Cyclicals ($56,087 million) have the largest values, and Real Estate ($13,168 million), Financials ($16,102 million), and Utilities ($23,989 million) have the lowest. Regarding the target's EBITDA margin, Real Estate is the industry with the highest average margin of 53.88%, which is 14.26 p.p. above the second-highest value from Utilities (39.62%). With only 2.92 p.p. separating Consumer Non-Cyclicals (16.32%), Consumer Cyclicals (16.39%), and Healthcare (19.24%), these industries had the lowest average values for the target's EBITDA margins.

Looking at Panel B, 19.14% of the 648 deals were tender offers, 36.11% were deals paid solely with cash, and 30.09% happened between acquirors and targets from different nations. Looking at each of the industries, Financials was the industry consistently registering the lowest proportions, with 11.86% of tender offers, 20.34% of cash payments, and 14.41% of cross-border deals. Utilities had the highest proportion of tender offer deals (25.81%), Consumer Cyclicals was the industry with the highest share of deals paid with cash (48.05%), and Basic Materials had the highest percentage of cross-border deals (42.42%). As seen through the standard deviation columns, there is a significant variability in the variables studied. This indicates a broad range of deals in the sample, going from under to overvalued bids, from smaller to bigger targets, and from lower to bigger deal values. This is a natural and expected representation, as in M&A contexts these characteristics inherently vary across industries, acquirors' strategic goals, geographic regions, and different bidding scenarios.

To gain a notion of how these descriptive statistics changed from merging the original 2,739-deals sample with the ESG data, Table 7 displays the same overall descriptive statistics as Table 6 and compares the 2,739-deals sample with the final 648-deals sample. As it is visible, even though the average percentage premium only decreased slightly (from 31.45% to 30.07%), the average premium in dollar terms increased greatly (from $543 million to 1,$731 million). This implies that upon the sample merger with the ESG data, the targets from the deals that remained were significantly larger. In fact, the average market value of targets more than doubled, going from $2,025 million to $5,950 million – smaller target firms were dropped for not having ESG data, which can indicate a tendency for these firms to not widely adopt public disclosure of this information. As for the other statistics, the average acquiror size decreased significantly (from $387,335 million to $40,206 million) as deals left in the final sample didn't have as extreme

values for the acquiror market value, and overall proportions of tender offers, cash payments, and cross-border deals didn't change greatly.

Table 8 displays the rank of the 10 target industries in the final sample by total deal volume, in $ million. Placing number one, Technology has a total deal volume of $979,830 million. From this value, around 22% was from 2015, one of the years in which Technology ranked top 1 industry. Besides 2010, 2013, and 2015, the technology sector ranked first in deal volume in 2020 and 2022, a period following the COVID-19 pandemic and the consequent accelerated adoption of digital and technological equipment. Ranking second, and despite being the industry with the fourth lowest number of transactions (47), Healthcare has a total volume of $662,664 million, having been top 1 in 2014 and 2018. This position in the rank is explained by the highest average deal value registered for Healthcare, as seen on Panel A of Table 6 ($14,099 million). With the highest number of deals (118 transactions), Financials only places sixth with a total volume of $413,869 million, indicating that the average deal value is low(er) when compared to other industries. This can be verified by looking at Panel A from Table 6, which shows that the industry with the lowest average deal value is Financials ($3,507 million). Placing eighth in the rank is the energy sector with a deal volume of $386,081 million. Although in the eighth position, Energy ranked first in three years, one of them being 2023, a year when demand for oil & gas increased to pre-pandemic levels.

Similarly to Table 8, Table 9 ranks acquirors' regions within the final sample according to total deal volume ($ million). With a wide gap, the US places first with a total deal volume of $2,859,482 million, more than double the volume of Europe, ranking second with a total of $1,081,126 million. The US was the top region in 12 of the 14 years analyzed, with Europe breaking that sequence in 2012 and 2015. All the other regions – Asia ($331,668 million), Canada ($196,263 million), Australia ($112,985 million), South America ($49,747 million), and Africa & Middle East ($17,296 million) – have deal volumes falling below one-third of Europe's volume.

Table 3 – ESG and CSR Industry Median Scores Evolution

These heat maps show the ESG and CSR median scores evolution per industry and year. In Panel A there are ESG scores, in Panels B, C, and D are Environmental, Social, and Governance scores, and in Panels E, F, and G are CSR Strategy, CSR Sustainability Committee, and CSR Sustainability Reporting scores. The evolution follows a 3-colour scale (from red, to yellow, to green) based on where a specific score is placed within the panel's maximum and minimum.

Table 3 – ESG and CSR Industry Median Scores Evolution (Continuation)

Panel A - Median ESG Scores

Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	34.79	40.17	40.26	38.58	40.16	41.01	40.30	38.96	40.16	41.09	40.38	42.15	43.45	45.39	47.26
Basic Materials	41.31	40.55	41.98	41.90	42.44	42.72	41.94	43.71	43.47	44.74	45.77	45.03	45.96	45.78	45.65
Industrials	38.22	38.47	39.29	40.11	41.88	42.69	42.53	42.25	41.61	41.38	42.12	42.46	44.16	44.67	46.40
Consumer Cyclicals	38.64	36.68	37.00	37.48	38.64	39.17	40.19	41.36	41.43	41.48	41.09	41.76	42.87	43.36	45.31
Consumer Non-Cyclicals	42.63	40.09	38.41	39.77	41.16	42.90	44.44	44.30	45.28	44.41	44.98	44.75	46.55	46.49	47.52
Financials	40.42	40.17	40.27	40.50	41.89	42.19	42.20	40.99	41.31	39.81	39.13	40.52	41.64	43.11	43.88
Healthcare	36.18	37.11	37.85	39.63	40.82	39.32	39.79	39.88	37.77	35.68	32.07	32.57	32.88	34.26	36.24
Technology	38.59	40.21	39.63	43.32	43.98	45.46	44.68	44.20	43.49	42.65	41.53	41.58	41.36	42.25	44.10
Utilities	48.57	50.03	46.00	44.00	44.74	43.73	45.68	45.94	45.37	44.71	46.06	46.54	47.23	47.72	50.17
Real Estate	29.59	31.08	32.49	34.51	36.17	36.20	36.07	37.20	35.93	36.57	38.23	41.85	45.12	46.90	47.47

Panel B - Median E Scores

Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	34.76	31.19	34.80	35.84	36.21	37.55	35.34	34.95	34.17	36.31	38.14	40.06	40.29	41.65	43.79
Basic Materials	42.72	42.11	44.10	42.06	41.92	41.22	39.88	42.14	43.59	41.11	41.17	41.24	42.61	42.78	42.83
Industrials	33.25	34.57	35.57	35.65	37.46	39.73	38.29	38.76	35.21	32.58	33.47	35.18	36.08	36.54	38.64
Consumer Cyclicals	31.53	31.86	28.52	29.48	30.33	31.01	31.65	33.80	29.25	27.81	28.23	31.62	34.46	36.36	39.02
Consumer Non-Cyclicals	38.37	35.69	41.36	37.41	37.95	40.88	39.21	39.77	39.88	38.89	39.26	40.79	41.77	44.48	45.19
Financials	31.93	31.59	35.96	32.71	35.23	37.96	38.22	35.21	29.80	27.18	26.38	29.27	32.96	35.44	38.35
Healthcare	22.11	22.44	24.24	25.49	32.29	25.42	24.85	22.61	16.29	4.05	0.00	0.00	2.60	3.99	13.45
Technology	22.62	27.87	28.15	34.10	34.02	37.56	36.28	34.14	30.43	25.78	23.83	25.43	25.86	28.32	30.96
Utilities	43.56	44.42	40.44	41.13	40.13	42.30	43.95	48.52	42.61	42.76	44.09	44.12	45.54	46.52	47.75
Real Estate	9.03	14.55	16.84	22.07	26.54	27.47	27.66	25.57	20.58	23.12	24.97	34.47	39.22	42.47	44.09

Panel C - Median S Scores

Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	36.24	32.02	35.69	35.87	34.55	34.43	35.80	35.50	37.22	39.55	39.91	42.18	43.65	46.71	48.01
Basic Materials	31.62	32.53	32.60	33.18	34.18	35.59	36.47	35.60	38.19	38.12	42.14	43.52	44.41	41.87	43.63
Industrials	36.46	35.77	35.39	36.35	39.84	39.82	40.49	41.36	41.57	40.94	43.26	43.57	44.53	45.39	47.11
Consumer Cyclicals	37.39	36.76	34.49	34.86	36.39	37.78	38.78	40.07	40.55	40.76	41.87	42.85	43.41	43.13	44.84
Consumer Non-Cyclicals	40.35	39.51	38.77	36.77	38.69	43.88	41.15	42.57	43.50	42.77	44.65	44.93	45.86	45.02	47.21
Financials	39.14	39.75	39.59	38.35	40.13	41.24	42.44	41.84	41.58	40.68	41.03	42.34	42.57	43.65	44.83
Healthcare	34.50	36.80	36.15	36.26	38.33	39.41	38.30	43.50	42.38	42.11	39.34	38.50	39.06	41.18	42.95
Technology	38.54	39.84	40.70	40.29	40.51	44.48	42.07	42.61	43.89	43.84	43.86	43.14	44.60	45.13	46.90
Utilities	43.44	42.18	40.24	40.43	39.83	37.50	39.60	43.92	41.36	40.60	43.89	43.23	44.97	48.00	48.18
Real Estate	39.61	39.89	37.53	39.41	41.63	41.96	41.78	42.42	42.61	45.58	43.97	46.75	46.76	49.17	49.33

Panel D - Median G Scores

Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	49.01	52.27	49.72	50.08	49.68	47.53	49.12	51.44	48.56	46.76	49.99	51.13	50.63	51.37	52.75
Basic Materials	47.65	46.02	48.30	48.77	50.80	50.40	51.12	53.76	53.06	54.45	51.68	53.09	51.77	51.54	50.76
Industrials	45.69	45.92	47.59	48.74	48.04	47.90	48.62	48.31	49.04	49.58	49.22	49.45	50.66	50.01	49.88
Consumer Cyclicals	42.24	42.05	44.78	43.46	42.93	43.94	46.36	47.76	47.63	49.92	47.65	48.33	49.30	49.46	49.93
Consumer Non-Cyclicals	46.70	48.50	52.20	50.02	51.54	52.65	52.50	50.50	50.65	51.71	50.52	49.78	50.37	49.63	52.26
Financials	49.63	50.22	53.67	50.59	52.06	50.40	50.43	49.61	49.27	50.02	50.85	50.42	49.73	52.01	51.33
Healthcare	48.90	48.04	49.06	48.39	49.72	47.49	51.07	49.30	45.87	44.34	38.44	38.35	40.16	41.59	43.13
Technology	52.31	50.97	51.95	55.29	54.17	53.00	53.80	52.07	50.58	48.30	48.29	49.68	48.23	47.63	48.56
Utilities	60.38	57.01	58.00	56.45	56.08	54.79	54.90	54.11	53.92	51.44	52.75	53.94	55.29	54.28	55.16
Real Estate	39.94	40.63	45.95	41.20	42.60	42.06	43.78	44.75	43.72	46.91	48.36	49.89	50.55	51.22	50.38

Source: Refinitiv Workspace and Author's Computation

Table 3 – ESG and CSR Industry Median Scores Evolution (Continuation)

	Panel E - Median CSR Strategy Scores														
Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	27.86	34.62	34.62	40.81	40.00	41.88	42.13	40.00	40.47	39.01	39.01	40.65	49.44	51.34	56.57
Basic Materials	35.62	42.42	45.97	46.05	45.00	43.70	47.23	47.69	45.82	45.83	47.58	46.71	50.42	51.34	52.70
Industrials	16.47	20.03	25.00	31.25	31.85	34.21	33.02	35.97	28.12	25.00	27.88	34.07	37.20	43.18	45.53
Consumer Cyclicals	12.45	13.39	13.39	15.38	21.10	23.00	21.82	22.30	16.00	14.26	15.12	21.91	25.00	31.00	36.09
Consumer Non-Cyclicals	28.33	32.74	39.84	41.91	40.59	42.50	40.88	43.59	40.61	41.76	41.85	42.86	44.31	48.06	48.22
Financials	0.00	2.12	12.68	16.32	18.18	20.89	23.98	16.67	8.79	4.81	5.56	12.70	17.92	27.11	34.59
Healthcare	0.00	0.00	11.86	11.96	15.38	14.32	16.07	15.94	5.17	0.00	0.00	0.00	0.00	0.00	6.25
Technology	3.92	13.18	21.04	25.14	36.00	34.42	34.83	31.70	16.75	13.51	12.10	15.89	22.63	28.27	35.11
Utilities	50.29	52.63	55.42	61.22	60.87	60.95	56.70	58.82	55.86	54.94	55.56	58.14	62.77	63.41	64.23
Real Estate	0.00	0.00	0.00	0.00	11.44	11.71	13.39	13.43	4.80	9.38	12.19	25.13	36.50	39.47	43.79

	Panel F - Median CSR Sustainability Committee Scores														
Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	0.00	0.00	62.22	63.31	64.29	62.50	60.61	62.94	66.07	55.15	52.17	58.19	66.67	67.24	66.19
Basic Materials	33.92	67.85	67.85	63.31	61.71	62.50	62.94	67.46	67.93	65.27	62.31	63.54	64.47	59.19	59.14
Industrials	0.00	0.00	60.11	60.19	60.19	60.19	60.52	57.81	0.00	0.00	0.00	0.00	55.71	58.63	59.14
Consumer Cyclicals	0.00	0.00	0.00	0.00	52.76	55.78	53.82	0.00	0.00	0.00	0.00	0.00	0.00	52.42	57.58
Consumer Non-Cyclicals	0.00	0.00	61.71	60.00	58.33	60.19	60.52	63.64	57.89	55.80	56.79	58.45	57.74	59.19	59.14
Financials	0.00	0.00	0.00	0.00	55.51	55.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.42
Healthcare	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Technology	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Utilities	0.00	66.67	68.47	67.90	67.49	66.86	67.30	68.42	68.02	66.86	66.03	68.42	66.67	65.19	63.09
Real Estate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.18	57.69	60.56

	Panel G - Median CSR Sustainability Reporting Scores														
Industry	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	0.00	50.00	0.00	56.00	57.14	56.25	56.06	55.30	53.13	54.31	53.92	55.93	58.81	58.55	57.83
Basic Materials	71.13	67.52	61.71	60.23	59.87	58.17	58.51	61.00	60.21	60.05	58.82	59.20	59.20	59.70	57.83
Industrials	0.00	0.00	58.33	58.51	58.17	57.77	56.49	57.87	56.76	51.70	55.00	57.63	58.81	58.47	57.25
Consumer Cyclicals	0.00	0.00	0.00	0.00	52.13	51.72	51.72	50.00	50.00	50.00	50.93	54.06	55.88	56.86	56.70
Consumer Non-Cyclicals	66.67	63.40	59.76	61.69	59.87	59.87	58.48	61.26	60.08	59.28	58.00	58.00	58.81	57.53	56.70
Financials	0.00	0.00	0.00	0.00	50.00	51.72	53.26	0.00	0.00	0.00	0.00	0.00	50.00	53.57	53.31
Healthcare	0.00	0.00	0.00	0.00	54.73	51.75	51.92	51.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Technology	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.71	51.20
Utilities	71.13	66.67	63.25	65.24	62.07	63.75	64.84	64.81	64.07	63.28	61.40	61.39	60.19	59.62	57.80
Real Estate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.92	55.54	56.70	57.25

Source: Refinitiv Workspace and Author's Computation

Table 4 – Average ESG Scores per Year and Industry, and Comparison Between Targets and Industry Median ESG Scores

This table shows the average ESG scores per industry and year. The green shading means that, for that industry and year, 50% or more of the targets' ESG scores were above the industry median. "-" represents years for which there was no deal with a target from that industry. The final row on the table indicates the distribution of the final 648 deals throughout the years.

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Energy	46.12	35.31	52.78	31.19	40.93	36.80	20.71	22.22	31.51	24.87	36.33	39.84	25.14	46.41
Basic Materials	32.77	43.13	33.98	32.53	40.83	43.85	45.59	6.77	41.00	45.01	39.60	48.16	33.50	67.48
Industrials	52.54	48.31	46.27	-	43.44	27.82	17.24	38.76	29.68	38.93	58.16	46.03	43.64	66.68
Consumer Cyclicals	36.85	38.87	31.20	34.57	54.86	38.40	41.60	39.61	42.23	50.82	32.65	60.75	52.43	40.51
Consumer Non-Cyclicals	-	46.49	31.59	-	43.31	31.75	51.98	38.54	19.27	28.18	56.79	33.12	64.80	47.71
Financials	42.26	28.70	34.74	42.97	53.62	38.42	27.01	32.98	34.83	34.87	40.57	36.03	44.02	38.98
Healthcare	38.10	23.85	26.25	32.56	46.88	30.77	38.12	25.17	62.81	64.37	57.35	41.94	32.78	26.43
Technology	37.23	41.10	15.29	37.21	30.20	41.54	30.89	27.33	38.25	37.29	45.61	44.51	46.47	38.01
Real Estate	-	-	-	36.38	42.46	-	44.26	40.28	32.36	31.28	1.89	51.83	50.54	33.17
Utilities	32.37	44.67	-	-	55.50	43.56	38.76	53.52	51.73	65.55	61.70	67.42	-	60.63
N	28	30	25	11	40	45	51	61	73	63	56	81	48	36

Source: Refinitiv Workspace and Author's Computation

Table 5 – Correlation Matrix Between the Independent Variables of the Study

This table displays the correlation matrix between the set of independent variables in the study: ESG scores, E, S, and G scores individually, and the three CSR scores: CSR Strategy (CSRSTRAT), CSR Sustainability Committee (CSRCOMM), and CSR Sustainability Reporting (CSRREP).

	ESG	*E*	*S*	*G*	*CSR STRAT*	*CSR COMM*	*CSR REP*
ESG	1						
E	0.85	1					
S	0.89	0.71	1				
G	0.70	0.42	0.40	1			
CSR STRAT	0.71	0.76	0.62	0.39	1		
CSR COMM	0.50	0.54	0.43	0.30	0.65	1	
CSR REP	0.68	0.71	0.58	0.37	0.82	0.56	1

Source: Author's Computation

Table 6 – Descriptive statistics per targets' industries

This table shows how several deal and target characteristics vary across targets' industries. Panel A displays the premium, in both percentage and dollar terms, the deal value, the target size, the acquiror size, and the target's EBITDA margin. Panel B shows the proportion of deals that were tender offers, the proportion of deals paid solely with cash, and the proportion of deals happening between acquirors and targets from different nations. The last column indicates the number of targets within each industry and the overall row joins deals from all industries.

	Panel A - Deal, Target & Acquiror Characteristics																		
	Premium (%)			Premium ($ Million)			Target Size ($ Million)			Deal Value ($ Million)			Acquiror Size ($ Million)			EBITDA margin (%)			
Target's Industry	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.	N
Energy	29.46	26.37	33.85	1,216	296	2,539	5,063	2,220	8,926	6,227	2,618	10,463	30,690	8,944	65,518	35.37	34.10	26.32	62
Basic Materials	29.02	26.24	34.18	1,452	302	3,242	5,450	1,902	10,546	6,034	2,186	12,634	23,992	9,102	47,314	27.34	22.50	15.96	66
Industrials	38.81	34.48	31.25	1,554	756	4,851	5,068	2,247	7,581	6,333	3,121	11,482	26,209	11,018	47,796	20.33	15.30	23.41	79
Consumer Cyclicals	29.00	29.00	32.96	1,481	450	4,543	6,312	1,966	11,392	7,603	2,400	15,658	56,087	9,929	146,835	16.39	14.30	10.19	77
Consumer Non-Cyclicals	31.57	29.97	25.60	3,163	765	6,885	11,265	3,856	20,919	12,869	4,994	22,867	47,968	15,009	86,666	16.32	12.80	12.63	33
Financials	21.15	19.16	25.67	747	149	2,229	3,448	1,200	7,432	3,507	1,037	9,280	16,102	5,450	25,724	38.51	41.05	17.44	118
Healthcare	35.75	32.87	29.44	2,952	1,179	8,390	10,745	3,957	14,078	14,099	5,484	20,607	62,425	28,998	99,846	19.24	17.30	12.18	47
Technology	38.98	33.35	49.57	3,368	918	11,888	7,098	3,347	12,467	9,998	4,045	19,163	87,044	15,019	307,314	23.20	19.30	14.36	98
Utilities	21.73	15.08	25.94	825	883	1,535	5,482	4,949	3,538	4,854	3,421	5,110	23,989	14,288	23,242	39.62	36.10	17.48	31
Real Estate	19.90	15.90	27.64	720	275	1,443	3,955	2,624	4,323	3,973	2,222	4,396	13,168	7,254	15,076	53.88	60.60	24.11	37
Overall	30.07	27.42	34.26	1,731	483	6,125	5,950	2,421	10,789	7,174	2,456	14,491	40,206	10,208	139,482	28.31	22.45	20.72	648

	Panel B - Proportion of Tender Offers, Cash Payments and Cross-Border deals			
	Tender Offer	Cash Payment	Cross-Border	
Target's Industry	%	%	%	N
Energy	12.90	22.58	32.26	62
Basic Materials	22.73	39.39	42.42	66
Industrials	17.72	44.30	26.58	79
Consumer Cyclicals	23.38	48.05	36.36	77
Consumer Non-Cyclicals	21.21	45.45	36.36	33
Financials	11.86	20.34	14.41	118
Healthcare	25.53	42.55	36.17	47
Technology	19.39	45.92	33.67	98
Utilities	25.81	32.26	32.26	31
Real Estate	24.32	21.62	24.32	37
Overall	19.14	36.11	30.09	648

Source: Refinitiv Workspace and Author's Computation

Table 7 – Descriptive Statistics Sample Comparison

Table 7 displays the overall descriptive statistics of the original 2,739-deals sample (before) and compares it with the final 648-deals sample (after).

	Before			After		
	Mean	Median	St. Dev.	Mean	Median	St. Dev.
Premium (%)	31.45	26.33	49.61	30.07	27.42	34.26
Premium ($ Million)	543	60	3,159	1,731	483	6,125
Target Size ($ Million)	2,025	324	6,223	5,950	2,421	10,789
Deal Value ($ Million)	2,292	289	7,826	7,174	2,456	14,491
Acquiror Size ($ Million)	387,335	2,800	12,961,326	40,206	10,208	139,482
EBITDA margin (%)	27.97	17.00	114.49	28.31	22.45	20.72
Tender Offer (%)	27.38	-	-	19.14	-	-
Cash Payment (%)	42.35	-	-	36.11	-	-
Cross-Border (%)	21.72	-	-	30.09	-	-

Source: Refinitiv Workspace and Author's Computation

Table 8 – Top Industries in Deal Volume ($ Million)

In this table, we can see the 10 target industries in the final sample ranked by deal volume ($ million). The 4th column indicates how many deals were made per industry and the 5th and 6th show the times each industry was classified as Top 1 and in which years that was, respectively.

Rank	Industry	Deal Volume ($ Million)	Deal Volume (N)	Frequency as Top 1 Industry	Years in Top 1
1	Technology	979,830	98	5	2010, 2013, 2015, 2020, 2022
2	Healthcare	662,664	47	2	2014, 2018
3	Consumer Cyclicals	585,402	77	1	2017
4	Industrials	500,329	79	1	2019
5	Consumer Non-Cyclicals	424,663	33	0	-
6	Financials	413,869	118	0	-
7	Basic Materials	398,233	66	2	2016, 2021
8	Energy	386,081	62	3	2011, 2012, 2023
9	Utilities	150,484	31	0	-
10	Real Estate	147,012	37	0	-

Source: Refinitiv Workspace and Author's Computation

Table 9 – Top Acquirors' Regions in Deal Volume ($ Million)

This table ranks the 7 acquirors' regions within the final sample in total deal volume ($ million) throughout the period analyzed. The 4th column indicates the number of deals registered in that region, and the 5th and 6th show the times, and in what years, the regions were the Top 1 in deal volume.

Rank	Region	Deal Volume ($ Million)	Deal Volume (N)	Frequency as Top 1 Region	Years in Top 1
1	United States	2,859,482	332	12	2010, 2011, 2013, 2014, 2016-2023
2	Europe	1,081,126	147	2	2012, 2015
3	Asia	331,668	77	0	-
4	Canada	196,263	41	0	-
5	Australia	112,985	25	0	-
6	South America	49,747	12	0	-
7	Africa & Middle East	17,296	14	0	-

Source: Refinitiv Workspace and Author's Computation

3.3. Methodology

The main goal is to analyze how several independent variables impact the dependent variable of the study – the takeover premium in dollars. The independent variables of focus – ESG and CSR scores – were retrieved with a one-year lag to avoid endogeneity issues. The basis for approaching the proposed research topic will be regression analysis. Regressions allow us to quantify the relationship between dependent and independent variables, while controlling for several variables, testing for comparative analysis with interaction terms, and testing the hypotheses placed and their significance. Five regression models will be tested in our pooled cross-section data to address different topics at various depths.

3.3.1. Does the targets' ESG performance affect the takeover premium?

With the lower risk (Giese et al., 2019) and the higher synergistic gains (Aktas et al., 2011) good ESG performance brings, this model intends to see if that performance is enough looked for so that it impacts the premium negotiated (in dollar terms[1]). For that, the following model will be tested:

$$Premium_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t-1} + \sum_{k=2}^{K} \alpha_k \, Controls_{\,k,i,t} + \lambda_t + \eta_j + \tau_n + \epsilon_{i,t}$$

ESG represents the ESG score at year $t-1$ of the target from deal i. λ_t represents the time-fixed effects for each year t, η_j denotes target TRBC industry fixed effects for each group j, τ_n represents target nation fixed effects for each nation n, and $\epsilon_{i,t}$ is the error term. Time-fixed effects were included to account for time-specific events that may affect the relationship between dependent and independent variables (as in Lim et al., 2016), industry-fixed effects were accounted for given the interindustry variation in the integration of external shocks and regulation (Mitchell & Mulherin, 1996), and target nation fixed effects were incorporated to recognize nation-specific factors like regulatory environments and nations' risk perceptions (Lim et al., 2016) that can affect the negotiated premium[2].

[1] After testing for both the premium in percentage and dollar terms, only the latter correctly captures the relationship between the premium paid and ESG scores, therefore, it was the chosen primary dependent variable.
[2] Acquiror nation fixed effects were also tested. However, as including them did not improve the overall goodness of fit of the model, they were dropped from the regression analysis.

For the set of K control variables, the goal was to account for several other factors influencing the takeover premium. The first control included was the natural logarithm of the acquiror's market value (following Lim et al., 2016). Acquiror size often reflects its bargaining power (either to push the premium down, or to secure the strategic acquisition), and its financial ability to pay premiums. To address the significant variability in this variable, the natural logarithm was used, ensuring the standardization of values and a proportional relationship through percentual change. The second control was the target's EBITDA margin. Such margin, which indicates a firm's efficiency and profitability, is known to be highly correlated with shareholder returns, as studied by McKinsey & Company (2021). This high correlation can therefore make a firm more attractive to investors possibly influencing their willingness to pay a premium. As for the third and fourth control variables, two dummies were created. The first dummy is for cash payments, following Aktas et al. (2010) and Alexandridis et al. (2013), and equals 1 when the deal was paid solely with cash, and 0 otherwise. When acquirors pay only with cash, this can be seen as a confidence signal and incentivize targets to accept the offer then, instead of holding on to potential future gains if the payment was with stock. The second dummy is for tender offers, as in Lim et al. (2016), and equals 1 when the deal was a tender offer, and 0 otherwise. When tender offers happen and external bidders appeal directly to shareholders, this can commonly be associated with hostile takeovers, where the bidder bypasses management to gain control over the firm, or friendly takeovers, where, in agreement with the management, the bidder goes directly to shareholders. As these offers stand within a certain time frame and are set for a specific price, the premium offered by bidders may be affected. Control variables like competitive bid (number of bidders > 1) and deal attitude (hostile VS friendly takeover) were not included in the model for lack of variation within the sample and risk of overfitting. Similarly, the natural logarithm of the deal value was also not included given a high correlation coefficient of 0.88 with the target size. For the following models, the four control variables will be the same, and λ_t, η_j, and τ_n will always represent time, target TRBC industry, and target nation fixed effects, respectively.

3.3.2. How do ESG components separately affect the takeover premium?

Having looked at the general ESG in the first model, and since Environmental, Social, and Governance assess different aspects, the goal in this second model is to go deeper into each of the ESG components. Do investors value them differently, so that each component impacts the premium differently? To test this hypothesis, we'll run the following regression:

$$Premium_{i,t} = \alpha_0 + \alpha_1 E_{i,t-1} + \alpha_2 S_{i,t-1} + \alpha_3 G_{i,t-1} + \sum_{k=4}^{K} \alpha_k \, Controls_{k,i,t} + \lambda_t + \eta_j + \tau_n + \epsilon_{i,t}$$

E, S, and G represent the Environmental, Social, and Governance scores at year $t-1$ of a given target from deal i. This second model uses the same set of controls and fixed effect terms as the first model.

3.3.3. Do CSR scores influence the takeover premium?

An increasingly mentioned topic is the Corporate Social Responsibility commitment of firms. As the ESG considerations, CSR aspects also lead companies to engage in more sustainable and ethical practices. With Hill et al. (2007) findings, a question is posed: if CSR can lead firms to successful financial performance, are investors willing to pay a premium for targets' CSR scores, looking to incorporate their practices and potential gains? This is what will be analyzed in this regression model.

$$Premium_{i,t} = \alpha_0 + \alpha_1 CSRStrat_{i,t-1} + \alpha_2 CSRComm_{i,t-1} + \alpha_3 CSRRep_{i,t-1} + \sum_{k=4}^{K} \alpha_k \, Controls_{k,i,t} + \lambda_t + \eta_j + \tau_n + \epsilon_{i,t}$$

$CSRStrat$, $CSRComm$ and $CSRRep$ are the independent variables representing the CSR Strategy, the CSR Sustainability Committee, and the CSR Sustainability Reporting scores at year $t-1$ of a specific target from deal i. In this model, the same set of controls and fixed effect terms were used.

3.3.4. Does the impact of targets' ESG on the takeover premium vary between industries?

As studied by Mitchell & Mulherin (1996), there is a variation in how firms from different industries react to external shocks. With the increasing regulations regarding ESG, do acquirors value ESG differently depending on the industry targets are in? Is the acquirors' willingness to pay a premium dependent on the targets' industry? For the fourth model, we address our second research question, which intends to see if acquirors value targets' ESG performance more/less

in a given industry than in another. To capture those specificities and to isolate the effect of each industry, we'll run a regression with interaction terms. Given the 10 industries analyzed, there will be 9 industry terms, with Healthcare being the reference industry.

$$Premium_{i,t,j} = \alpha_0 + \alpha_1 ESG_{i,t-1} + \sum_{j=2}^{J} \alpha_j Industry_j + \sum_{j=2}^{J} \beta_j (ESG_{i,t-1} \times Industry_j) + \sum_{k} \alpha_k Controls_{k,i,t} + \lambda_t + \tau_n + \epsilon_{i,t,j}$$

$\sum_{i=2}^{I} \alpha_i Industry_i$ represents a set of dummy variables that equal 1 when the target from a deal i is from industry j, and $\sum_{j=2}^{J} \beta_j (ESG_{i,t-1} \times Industry_j)$ represents the set of interaction terms between ESG scores and industry dummies. The same control variables were used, and time and target nation fixed effects were considered.

3.3.5. Does the impact of targets' ESG on the takeover premium vary between regions?

As studied by Duuren et al. (2015), how ESG investing is viewed varies across geographies. While the US sees it with a less optimistic lens, European firms place ESG investing closer to fundamental investing. In this fifth model, the goal is to address the third research question and see if that difference in optimism reflects on the premium paid. As in the final sample, and as seen in Table 6, there isn't a significant number of deals with acquirors from other regions, the US and Europe will be the focus for this regression. Similarly to what was done in the previous model, here we also want to isolate the effect of the region, hence the use of interaction terms.

$$Premium_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t-1} + \alpha_2 US_i + \alpha_3 (ESG_{i,t-1} \times US_i) + \sum_{k} \alpha_k Controls_{k,i,t} + \lambda_t + \eta_j + \tau_n + \epsilon_{i,t}$$

Deals in which the acquiror is from the US will have the dummy US equal to 1, and deals with European acquirors will have that dummy equal to 0. $\alpha_3 (ESG_{i,t-1} \times US_i)$ represent the ESG and US dummy interaction term. The same set of control variables was used, and time, target TRBC industry, and target nation fixed effects were accounted for.

4. Results

In this section, we analyze the results of the five regression models that address the three proposed research questions: whether targets' ESG performance impacts the negotiated premium, whether that impact varies across target industries, and whether that impact differs from American to European investors.

4.1. Does the targets' ESG performance affect the takeover premium?

The results from the first regression model are presented in Table 10. In both specifications, there's an indication that the target's ESG score positively impacts the takeover premium. However, only on specification (2), when fixed effects are introduced, does that impact become statistically significant, suggesting that accounting for time-specific events, and for industry and country effects is relevant for analyzing the variable of focus. The target's ESG score is significant at the 1% level, with a positive coefficient of 33.87, indicating that a one-point increase in the ESG score leads to a $33.87 million increase in the premium. Besides providing statistical significance to the variable of the study, adding fixed effects also greatly contributes to the overall goodness of fit of the model, with R-squared and adjusted R-squared going from 9.98% and 9.28% to 64.52% and 57.17%, respectively. With the fixed effects, the model explains 64.52% of the variation of premiums. Apart from ESG, all the control variables in the model showed statistical significance in specification (2). The natural logarithm of the acquiror's market value, statistically significant at the 1% level, has a positive coefficient of 917.16, implying that a one-percent increase in the acquiror size is associated with an increase of around $9 million in premiums. This lets us know that larger acquirors tend to pay higher premiums. The EBITDA margin coefficient is significant at the 10% level, indicating a positive, but weaker, relation with the takeover premium. The higher the operating efficiency and profitability of the target, the higher the premium offered – a 1 p.p. increase in the EBITDA margin is associated with a $16.95 million increase in premiums. As for the coefficients of the two dummies, both were negative and statistically significant at the 10% level, indicating that cash payments and tender offer deals are associated with lower premiums of around $764 million and $921 million, respectively. In this model and the following, we get contradictory results regarding the cash payment dummy compared to the study by Aktas et al. (2010). Instead of positively impacting the premium, our results indicate that cash payments negatively impact

the premium. This may have to do with different sample-specific dynamics or effects that cash offers have on the deals studied.

Table 10 – Impact of Targets' ESG Performance on the Takeover Premium

This table shows the results of the first regression model where the relationship between the targets' ESG scores and the takeover premium (in dollar terms) is evaluated. While testing for that relationship, four control variables were used: the natural logarithm of the acquiror market value, the target's EBITDA margin, the cash payment dummy (equaling 1 when the payment was only with cash, and 0 otherwise), and the tender offer dummy (equaling 1 when the deal was a tender offer, and 0 otherwise). Apart from the control variables time, target TRBC industry and target nation fixed effects were accounted for. Specification (1) shows the results without accounting for fixed effects, and specification (2) shows the results when the fixed effects were included. The number of observations, the R-squared, and the adjusted R-squared (both presented in percentage) are presented at the bottom lines of the table.

	(1)	(2)
Variables	Premium	Premium
ESG	15.28	33.87***
	(12.55)	(10.50)
Ln(Acquiror Market Value)	1,167.98***	917.16***
	(155.13)	(130.23)
EBITDA margin	5.24	16.95*
	(11.34)	(10.27)
Cash Payment	-891.46*	-764.51*
	(512.89)	(399.42)
Tender Offer	-1,008.23*	-921.32*
	(606.70)	(535.15)
Constant	-9,325.51***	-4,038.16
	(1,418.01)	(4,313.03)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Target TRBC Industry Fixed Effects	No	Yes
Observations	648	648
R-squared	9.98	64.52
Adjusted R-squared	9.28	57.17

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2. How do ESG components separately affect the takeover premium?

To address the first research question on a deeper layer, in the second model, we take the three E, S, and G scores separately, looking to understand how each of them individually impacts the takeover premium. The regression results are presented in Table 11. In the first four specifications, where fixed effects were not included, only control variables and the constant show statistical significance. When fixed effects are included, not only do the variables of the study become statistically significant, but the overall goodness of fit of the model increases greatly, with the models going from explaining around 10% to around 64% of the premium variation. For specifications (5) through (7), all three scores have positive and statistically significant coefficients at the 1% and 5% level when evaluated individually. On specification (5), the coefficient for E scores indicates that a one-point increase in the target's ESG score leads to an increase in premium of $25.92 million. Similarly, in specifications (6) and (7), the coefficients for S and G scores imply that a one-point increase in those scores leads to an increase in premium of $23.29 million and $22.03 million, respectively. However, the significance for S and G coefficients is lost on specification (8), when all three scores are included. This indicates that, while S and G scores partially explain the variation of the premium (as including them alongside the E score, led to the highest adjusted R-squared of 57.21%), most of the model's explanatory power comes from the E score – reinforcing this relationship is the high correlation (see Table 5) of 0.85 between E and ESG scores. Looking at the E-score coefficient, significant at the 10% level, a one-point increase in the E-score is associated with a $18.84 million increase in the premium paid. The loss of significance from the S and G scores coefficients can indicate the presence of multicollinearity (with high correlations mainly between E and S scores), where it becomes harder for the model to attribute the unique impact of S and G scores on the takeover premium.

Apart from the variables of focus, and looking at specification (8), all control variables' coefficients showed significant results, maintaining the sign of their impact on the premium. Significant at the 1% level, the coefficient of the natural logarithm of the acquiror size indicates that a 1% increase in the acquiror size leads to an approximate increase in premium of $9 million. With a significance level of 10%, the EBITDA margin coefficient tells us that a 1 p.p. increase in the margin is associated with an increase in the takeover premium of $17.41 million. As for the dummy variables, their coefficients were both significant at the 10% level, indicating that deals paid solely with cash, and tender offers deals are associated with a lower premium of $761.90 million and $912.05 million, respectively.

Table 11 – Impact of Targets' E, S, and G scores on the Takeover Premium

This table shows the results of the second regression model where the relationship between each component of the targets' ESG scores and the takeover premium (in dollar terms) is evaluated. Included in the models below is the same set of control variables – ln(Acquiror Market Value), the target's EBITDA margin, and the dummies for cash payments and tender offers. Regarding the fixed effects (time, target TRBC industry, and target country), only the latter four specifications account for them. Specification (1) illustrates the regression results when the E-score was included as the only independent variable of focus and specifications (2) and (3) illustrate the same but for S and G scores. Specification (4) shows the results when all three scores (E, S and G) were included in the same regression. Likewise, the following specifications, (5), (6), (7), and (8), follow the same methodology but include fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Premium	Premium	Premium	Premium	Premium	Premium	Premium	Premium
E	11.95			10.63	25.92***			18.84*
	(9.19)			(12.91)	(8.00)			(10.90)
S		11.11		2.29		23.29**		3.46
		(11.15)		(15.44)		(9.34)		(12.48)
G			5.84	0.08			22.03***	13.22
			(10.53)	(11.66)			(8.24)	(9.05)
Ln(Acquiror Market Value)	1,166.61***	1,177.59***	1,213.17***	1,163.16***	917.08***	960.67***	984.25***	900.60***
	(154.35)	(155.33)	(149.35)	(156.34)	(130.18)	(129.09)	(126.34)	(130.85)
EBITDA margin	4.38	4.96	4.61	4.51	16.16	15.87	18.07*	17.41*
	(11.31)	(11.34)	(11.34)	(11.38)	(10.27)	(10.31)	(10.33)	(10.30)
Cash Payment	-870.04*	-903.20*	-933.61*	-869.75*	-771.55*	-792.71**	-835.15**	-761.90*
	(514.13)	(512.89)	(511.88)	(514.97)	(399.19)	(400.86)	(399.37)	(399.39)
Tender Offer	-1,031.15*	-993.26	-917.09	-1,035.61*	-899.63*	-967.66*	-979.17*	-912.05*
	(608.44)	(607.47)	(601.67)	(610.61)	(535.43)	(536.83)	(536.30)	(535.39)
Constant	-9,068.35***	-9,261.84***	-9,393.23***	-9,097.80***	-3,691.08	-3,898.47	-5,179.05	-4,194.36
	(1,418.28)	(1,416.25)	(1,455.82)	(1,485.08)	(4,318.12)	(4,334.92)	(4,328.62)	(4,335.42)
Time Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target Nation Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target TRBC Industry Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	648	648	648	648	648	648	648	648
R-squared	10.01	9.92	9.82	10.02	64.53	64.25	64.31	64.68
Adjusted R-squared	9.31	9.21	9.12	9.03	57.18	56.84	56.91	57.21

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.3. Do CSR scores influence the takeover premium?

As the ESG considerations, the CSR topic has also become increasingly relevant in society and the corporate world. But are CSR practices looked for by investors to the point where the takeover premium is affected? This is what we tested in regression model number three. The results are presented in Panel A of Table 12. As the previous models analyzed, only when adding fixed effects do the coefficients from the variables of focus – the CSR scores – become significant. However, contrary to what happened with the second model, on specification (8), when the three CSR scores were included in the same regression, the adjusted R-squared decreased – it went from the highest value of 57.06% on specification (5) to 56.93%. This implies that the CSR Sustainability Committee and CSR Sustainability Reporting scores do not hold explanatory power over the takeover premium. In turn, this leads to the conclusion that the significance registered in specification (7) for the CSR Sustainability Reporting coefficient can be an absorption of the CSR Strategy influence (given the high correlation of 0.82 between CSR Reporting and CSR Strategy scores seen in Table 5). Focusing on the fifth specification, with the highest adjusted R-squared, the variable CSR Strategy is significant at the 1% level with a positive coefficient of 20.09, indicating that a one-point increase in the CSR Strategy score is associated with a $20.09 million increase in the takeover premium.

With CSR standards not being as widely put into practice and communicated as ESG practices, from the targets within the final sample, around 50% of them have a value of 0 for each of the CSR scores. This can represent a limitation as 50% of each CSR score equaling 0 limits sample variation. To address this issue, a robustness check was performed, and another set of regressions was tested without the observations from targets with CSR scores of 0. As seen in Panel B of Table 12, the statistical significance of CSR score coefficients was lost, indicating that the presence of scores equaling 0 contributed to the obtained results. By removing the CSR Strategy, Committee, and Reporting scores equaling 0, the number of observations was reduced by almost a third, going from 648 to 218. This significantly reduces the model's statistical and explanatory power as seen through the adjusted R-squared values. In addition, the smaller sample size leads the fixed effects to have a negative contribution to the overall goodness of fit of the model – the specifications without the fixed effects have higher adjusted R-squared values, which may entail that industry, country or time-specific events are going by unobserved. When comparing both panels, the results indicate that engaging in CSR concerns, even if with a score of 0, significantly contributes to explaining the premium's variation. This is, targets that may engage in these matters but do not formally communicate them through a CSR committee

or a CSR report section on their annual reports (therefore having a score of 0), still contribute to the model. As Panel A represents a bigger portion of the universe and provides results with higher explanatory power, those regressions are preferable and more reliable for this study, specifically regression (5) with the highest adjusted R-squared. As for the controls in that specification, all had statistically significant coefficients, with a 1% increase in the acquiror size indicating an approximate $9 million increase in premium, with a 1 p.p. increase in EBITDA margin leading to a $16.97 million increase in premium, and with cash payments and tender offers leading to $792.46 million and $918.74 million decrease in premium, respectively.

Table 12 - Impact of Targets' CSR Scores on the Takeover Premium

Table 12 shows the results for the third regression model, where the relation between CSR Strategy (CSRSTRAT), CSR Sustainability Committee (CSRCOMM), and CSR Sustainability Reporting (CSRREP) scores and the takeover premium is evaluated. In Panel A are the results for the regressions ran on the full sample, and in Panel B are the results for the regressions ran without considering the observations from targets with CSR scores of 0 (to address a potential limitation in performing a robustness check). Both panels have eight specifications, with only the last four accounting for fixed effects. A set of 4 control variables was used in all specifications – ln(Acquiror Market Value), the target's EBITDA margin, and cash payment and tender offer dummies. Specifications (1) through (3) and (4) through (7) take the individual scores and specifications (4) and (8) join the three.

Panel A - Full Sample Regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Premium	Premium	Premium	Premium	Premium	Premium	Premium	Premium
CSRSTRAT	10.98			13.34	20.09***			26.13**
	(7.73)			(14.08)	(6.71)			(11.77)
CSRCOMM		4.71		-1.65		7.88		-1.39
		(6.37)		(8.26)		(5.21)		(6.34)
CSRREP			7.09	-1.18			10.55**	-5.00
			(6.66)	(11.15)			(5.31)	(8.61)
Ln(Acquiror Market Value)	1,165.20***	1,202.78***	1,184.95***	1,166.08***	931.86***	1,018.11***	991.54***	929.67***
	(153.58)	(150.76)	(152.44)	(153.91)	-129.86	(126.26)	(127.72)	(130.10)
EBITDA margin	4.73	4.38	4.91	4.68	16.97*	15.97	16.19	17.13*
	(11.31)	(11.32)	(11.33)	(11.34)	(10.29)	(10.35)	(10.33)	(10.31)
Cash Payment	-892.72*	-947.97*	-898.34*	-887.59*	-792.46**	-880.04**	-806.11**	-800.65**
	(512.15)	(511.55)	(512.99)	(514.94)	(399.41)	(400.84)	(401.86)	(401.24)
Tender Offer	-1,034.01*	-925.39	-980.37	-1,042.02*	-918.74*	-960.91*	-985.20*	-906.51*
	(607.31)	(601.80)	(605.06)	(609.45)	(535.98)	(539.16)	(537.87)	(537.45)
Constant	-8,976.46***	-9,165.53***	-9,097.97***	-8,959.06***	-3,569.56	-4,221.35	-4,080.77	-3,563.86
	-1,423.14	(1,416.64)	(1,418.56)	(1,427.30)	(4,328.59)	(4,348.53)	(4,342.63)	(4,335.46)
Time Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target Nation Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target TRBC Industry Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	648	648	648	648	648	648	648	648
R-squared	10.06	9.85	9.94	10.07	64.43	63.98	64.10	64.45
Adjusted R-squared	9.36	9.15	9.23	9.08	57.06	56.53	56.66	56.93

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12 - Impact of Targets' CSR Scores on the Takeover Premium (Continuation)

Panel B - No 0 CSR Scores Regressions								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Premium	Premium	Premium	Premium	Premium	Premium	Premium	Premium
CSRSTRAT	11.91			12.70	41.45			43.82
	(19.65)			(19.79)	(30.11)			(30.36)
CSRCOMM		-13.74		15.85		-94.56		23.22
		(43.55)		(85.90)		(146.70)		(254.40)
CSRREP			-17.44	-30.75			-160.75	-204.83
			(36.68)	(72.43)			(178.50)	(309.74)
Ln(Aqcuiror Market Value)	1,600.73***	1,668.38***	1,672.33***	1,614.78***	1,406***	1,629.17***	1,614.78***	1,391.13***
	(286.00)	(279.11)	(277.26)	(291.45)	(405.4)	(379.13)	(377.81)	(408.49)
EBITDA margin	20.50	22.36	22.82	21.82	62.11	61.01	60.45	60.76
	(22.80)	(22.95)	(22.94)	(23.08)	(39.66)	(39.92)	(39.86)	(39.84)
Cash Payment	326.22	348.24	347.15	330.37	-36.85	33.32	-14.79	-80.54
	(937.36)	(938.44)	(937.74)	(941.94)	(1,295)	(1,302.76)	(1,300.66)	(1,304.23)
Tender Offer	-1,419.90	-1,482.99	-1,552.81	-1,583.30	-3,443**	-3,393.61**	-3,247.17*	-3,173.50*
	(1,008.44)	(1,041.63)	(1,057.77)	(1,062.81)	(1,635)	(1,649.13)	(1,660.86)	(1,666.63)
Constant	-14,097.22***	-13,078.02***	-12,888.52**	-13,281.92***	-15,898.59**	-7,064.92	-1,227.48	-413.00
	(2,794.99)	(3,786.13)	(3,484.15)	(3,809.49)	(6,589.46)	(13,884.41)	(16,589.77)	(16596.03)
Time Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target Nation Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Target TRBC Industry Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
Observations	218	218	218	218	218	218	218	218
R-squared	15.92	15.82	15.87	16.04	44.74	44.07	44.25	45.22
Adjusted R-squared	13.94	13.88	13.88	13.25	9.1	-0.30	0.02	0.11

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.4. Does the impact of targets' ESG on the takeover premium vary between industries?

Different firms in different industries react to external shocks in different ways, as studied by Mitchell & Mulherin (1996). If firms' reaction varies with industry, with the increasing ESG regulations, do acquirors value ESG differently depending on the industry targets are in? For the fourth model, we address one of our secondary research questions to see if acquirors value targets' ESG performance more/less in a given industry. The results from this model are presented in Table 13 (for the complete version, refer to Appendix 2). ESG coefficients are significant at the 5% and 1% level, in both specifications (1) and (2), respectively. Focusing on the second specification, which is the one with greater explanatory power over the variation of the premium (adjusted R-squared of 56.98%), the ESG coefficient indicates that a one-point increase in ESG scores of targets from the Healthcare industry leads to a $95.11 million increase in the premium negotiated. Regarding the industry dummies, all coefficients indicate that the 9 industries in the model are associated with higher premiums than the reference industry – Healthcare. However, only the dummy variables for Consumer Cyclicals and Consumer Non-Cyclicals have significant coefficients at the 10% level. Holding everything constant, being a target from Consumer Cyclicals and Consumer Non-Cyclicals is associated, on average, with

an additional premium of $3,236.37 million and $3,514.57 million, respectively, versus the Healthcare industry, suggesting that targets from these industries receive larger premiums than Healthcare targets. As for the ESG and industry interaction terms, all coefficients, from both specifications, have a negative sign, suggesting that ESG scoring improvements translate into lower increases in premiums for these 9 industries when compared to Healthcare. Showing statistically significant coefficients at the 10% and 5% level are the industries of Consumer Cyclicals, Financials, Real Estate, and Utilities, for which a one-point increase in ESG scores leads to a lower increase in premium than the one in the Healthcare industry in $79.10 million, $74.60 million, $90.63 million, and $117.21 million, correspondingly. For the case of Utilities, as the absolute value of the lower increase in premium is larger than the baseline premium increase for Healthcare ($95.11 million), this means that a one-point increase in the ESG of targets from Utilities is associated with a decrease in premium offered in around $22 million.

For this model, on specification (2), only the natural logarithm of the acquiror market size and the target's EBITDA margin had statistically significant coefficients of 948.40 and 17.46, indicating that a 1% increase in the acquiror's size is associated with an increase in premium of around $9 million and a 1 p.p. increase in the EBITDA margin is linked with an increase in premium of $17.46 million, respectively. For the first time, in the model with the highest explanatory power, the constant also has a significant coefficient of -7,485.39, which tells us that, when accounting for fixed effects, the baseline premium for targets from the healthcare industry when their ESG is zero, and when all the remaining independent variables are zero, is $-7,485.39 million. Although non-significant, the two control dummy variables continue to indicate that cash payments and tender offers are associated with lower premiums.

Table 13 – How ESG Impacts the Takeover Premium on Different Industries

In this table are presented the results from the fourth regression model addressing the second research question. Taking Healthcare as the reference industry and with the 9 remaining industries from the final sample, 9 interaction terms were created to analyze whether the impact of ESG performance on the takeover premium varied across industries. In specification (1) the results shown do not include fixed effects, and in specification (2), they do include time and target nation fixed effects. Control variables for the natural logarithm of the acquiror's size, the target's EBITDA margin, cash payments, and tender offers were included in both specifications. These specifications only show significant results. For the complete version, see Appendix 2.

Table 13 – How ESG Impacts the Takeover Premium on Different Industries (Continuation)

	(1)	(2)
Variables	Premium	Premium
ESG	111.06**	95.11***
	(44.29)	(32.68)
Consumer Cyclicals	4,317.91	3,236.37*
	(2,684.51)	(1,910.35)
Consumer Non-Cyclicals	4,444.17	3,514.57*
	(2,942.82)	(2,124.76)
Technology	6,486.77***	763.23
	(2,454.89)	(1,778.65)
ESG X Consumer Cyclicals	-110.59*	-79.10*
	(57.85)	(41.99)
ESG X Financials	-103.27*	-74.60*
	(55.30)	(41.21)
ESG X Technology	-138.74**	-12.87
	(54.98)	(40.33)
ESG X Real Estate	-102.55	-90.63*
	(65.69)	(48.08)
ESG X Utilities	-133.77*	-117.21**
	(70.13)	(52.77)
Ln(Acquiror Market Value)	1,076.02***	948.40***
	(163.09)	(123.15)
EBITDA margin	18.93	17.46*
	(13.17)	(9.74)
Cash Payment	-974.74*	-605.34
	(518.86)	(384.25)
Tender Offer	-939.93	-853.60
	(618.60)	(522.25)
Constant	-12,354.89***	-7,485.39*
	(2,547.58)	(4,486.14)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Observations	648	648
R-squared	12.61	62.43
Adjusted R-squared	9.39	56.98

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.5. Does the impact of targets' ESG on the takeover premium vary between regions?

As acquirors' views on ESG investing have been studied to be dependent on the acquiror's nation (Duuren et al., 2015), the goal with this fifth model was to understand if that more optimistic or pessimistic lens with which acquirors look at ESG investing translates into an impact on the takeover premium. Only considering the deals with acquirors from the most represented nations – US and Europe –, the regression sample was reduced to 479 observations. The results are presented in Table 14. Comparing specifications (1) and (2), although the coefficient from ESG loses its statistical significance, the overall goodness of fit of the model benefits with the addition of the time, target TRBC industry, and target nation fixed effects, as the explanatory power of the model increased greatly, going from an R-squared and an adjusted R-squared of 12.73% and 11.43% to 68.76% and 61.11%, respectively. Although not significant in the second specification, the coefficient from ESG seems to indicate that non-US (European) acquirors decrease the premium offered when the target's ESG score increases.

With a statistical significance at the 5% level, the US coefficient tells us that, all else being equal, US acquirors pay, on average, a premium that is $-3,185.78 million lower than the one European acquirors pay. Even though US acquirors tend to pay overall lower premiums than European acquirors, the ESGXUS interaction term coefficient, significant at the 1% level, suggests that a one-point increase in targets' ESG score leads US acquirors to pay a premium $76.63 million higher than the one European investors pay. If we take into account the -17.72 ESG coefficient, this means that, for US acquirors, a one-point increase in targets' ESG scores is associated with a $58.91 million increase in premium.

Regarding the control variables, only the EBITDA margin's coefficient (indicating a positive relation between the operating efficiency and profitability, and the takeover premium) was not significant. The coefficient of the natural logarithm of the acquiror market value, statistically significant at the 1% level, indicates that a 1% increase in the acquiror's size is associated with an approximate $10 million increase in the takeover premium. The coefficients for the cash payment and tender offer dummy variables indicate that deals paid solely with cash and tender offer deals are associated with lower premiums of around $1,143 million and $2,723 million, correspondingly. The significant constant with a coefficient of -9,061.97 tells us that, when accounting for fixed effects, the baseline premium for European acquirors when their ESG is zero, and when all other independent variables are zero, is $-9,061.97 million.

Table 14 – How ESG Impacts the Takeover Premium on Different Regions

Table 14 illustrates the results for the fifth regression model, where the goal is to understand if the impact that targets' ESG performance has on the takeover premium varies with acquirors' regions, specifically with acquirors from the US and Europe. The table has two specifications. Specification (1) does not account for time, target TRBC industry, and target nation fixed effects, and specification (2) does. The same 4 control variables were used in both specifications – ln(Acquiror Market Value), the target's EBITDA margin, and dummy variables for cash payment and tender offers.

	(1)	(2)
Variables	Premium	Premium
ESG	-70.78***	-17.72
	(26.77)	(23.75)
US	-6,205.68***	-3,185.78**
	(1,595.97)	(1,316.41)
ESGXUS	117.54***	76.63***
	(33.10)	(27.71)
Ln(Acquiror Market Value)	1,315.46***	1,025.10***
	(205.37)	(166.85)
EBITDA margin	1.90	17.86
	(15.63)	(14.53)
Cash Payment	-1,518.86**	-1,143.23**
	(699.13)	(557.02)
Tender Offer	-1,786.63**	-2,722.56***
	(867.48)	(780.83)
Constant	-5,468.77**	-9,061.97***
	(2,282.44)	(2,709.74)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Target TRBC Industry Fixed Effects	No	Yes
Observations	479	479
R-squared	12.73	68.76
Adjusted R-squared	11.43	61.11

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Robustness Checks

To gather whether the chosen methodology holds up, and to ensure the reliability and consistency of the results, in this section, we run robustness checks.

5.1. Removing the most representative industry

For the first robustness check, we ran the first model after removing the most representative industry – Financials. As seen in Table 15, the results show that the relationship between the targets' ESG scores and the takeover premium remains positive and significant at the 1% level, suggesting that a one-point increase in the ESG score is associated with an increase in the premium of $42.52 million. As the results held up, we can state that the previously obtained results are not driven by a single dominant industry.

Table 15 – Robustness Check: removing the most representative industry

This table shows the results from the first robustness check where the first regression model was run on a subsample created by dropping the deals from the most representative industry – Financials. In specification (1) are the results of the regression run without accounting for fixed effects, and in specification (2) are the results of the regression model accounting for them.

	(1)	(2)
Variables	Premium	Premium
ESG	15.73	42.52***
	(14.61)	(11.44)
Ln(Acquiror Market Value)	1,201.87***	934.53***
	(185.34)	(145.63)
EBITDA margin	9.47	24.10**
	(13.69)	(11.49)
Cash Payment	-877.64	-522.57
	(605.30)	(449.23)
Tender Offer	-962.22	-1,063.84*
	(710.80)	(594.81)
Constant	-9,683.58***	-4,623.45
	(1,707.82)	(4,652)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Target TRBC Industry Fixed Effects	No	Yes
Observations	530	530
R-squared	9.37	62.51
Adjusted R-squared	8.51	57.08

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.2. Splitting the sample into two subsamples by deal value

For the second robustness check, we ran the first regression model across two subsamples created from the original 648-deals sample according to deal value. In Panel A of Table 16 are the results from the regression run on the 50% of deals with lower deal values, and in Panel B are the results from the regression run on the 50% of deals with higher deal values. Only in Panel B (top 50%) does the ESG coefficient remain positive and statistically significant, indicating that ESG premium may only be relevant for larger deals. Corroborating this is the low adjusted R-squared registered in specification (2) of Panel A (3.38%), and the contrastingly high adjusted R-squared in specification (2) of Panel B (57.69%). This value is even slightly higher than the one resulting from running the first regression model on the full sample (57.17% - Table 10, specification (2)), indicating a stronger explanatory power. According to the results shown in Panel B, for larger deals, a one-point increase in the target's ESG score is associated with a $52.34 million increase in the takeover premium.

Table 16 – Robustness Check: Creating Two Subsamples according to Deal Value

This table presents the results from running the first regression model across two different subsamples created according to deal value. In Panel A are the results of the regression run on 50% of the deals with the lower deal values, and in Panel B are the results of the regression run on 50% of the deals with the higher deal values. In both panels, specification (1) does not account for fixed effects, while specification (2) does.

Panel A - Bottom 50% deals in Deal Value		
	(1)	(2)
Variables	Premium	Premium
ESG	1.52	-0.69
	(2.02)	(2.86)
Ln(Acquiror Market Value)	54.87**	57.41*
	(25.78)	(33.99)
EBITDA margin	-0.02	0.23
	(1.58)	(2.32)
Cash Payment	119.90	23.40
	(77.71)	(101.00)
Tender Offer	137.83	198.95
	(85.77)	(123.16)
Constant	-361.15	-247.01
	(219.06)	(758.68)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Target TRBC Industry Fixed Effects	No	Yes
Observations	324	324
R-squared	5.94	31.80
Adjusted R-squared	4.46	3.38

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16 – Robustness Check: Creating Two Subsamples according to Deal Value (Continuation)

Panel B - Top 50% deals in Deal Value		
	(1)	(2)
Variables	Premium	Premium
ESG	10.44	52.34**
	(23.08)	(20.67)
Ln(Acquiror Market Value)	1,938.68***	1,781.16***
	(359.17)	(301.86)
EBITDA margin	11.48	28.57
	(23.51)	(21.79)
Cash Payment	-1,007.08	-871.27
	(1,000.16)	(791.12)
Tender Offer	-1,706.57	-3,162.80***
	(1,255.92)	(1,189.85)
Constant	-16,472.21***	-19,414.93***
	(3,590.87)	(4,177.14)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Target TRBC Industry Fixed Effects	No	Yes
Observations	324	324
R-squared	9.53	69.74
Adjusted R-squared	8.11	57.69

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. Conclusion

The proposed analysis for this study was regarding the relation between ESG performance and considerations, and the takeover premium acquirors pay in M&A transactions – are ESG practices and scores valued to the point where the premium acquirors pay is influenced? This was what we proposed to answer.

With the first model, besides understanding the importance of time, industry, and nation-fixed effects, we find that the ESG score positively and significantly impacts the takeover premium overall. The results lead to the conclusion that a one-point increase in the ESG score is associated with a $33.87 million increase in the premium offered. However, as seen through the second robustness check, a mindful approach is necessary as this relation may only be relevant for larger deals. When decomposing the ESG score into its three components separately – E, S, and G – we concluded that, although the three scores contribute to the overall goodness of fit of the model, the E-score, being the only variable with a statistically significant coefficient when all three scores are simultaneously tested, might be the score holding the greater explanatory power. In other words, when including the three scores, there's only statistically significant evidence of the E-score positively impacting the premium paid. The loss of significance from the S and G-score coefficients may have to do with multicollinearity issues, as particularly E and S scores have a high correlation coefficient.

For the third model, we delved into the CSR topic, where we concluded that out of the three analyzed scores – CSR Strategy, Sustainability Committee, and Sustainability Reporting – CSR Strategy seems to be the score holding the most explanatory power over the takeover premium, positively impacting it. After addressing a potential limitation by running a robustness check without the deals from targets registering CSR scores of 0, we concluded that targets that may engage in these matters but don't form a CSR committee or don't open a CSR report section on their annual reports (therefore having a score of 0), still contribute to the model.

In the fourth model, we addressed the second research question where we wanted to understand if the impact that targets' ESG scores have on premiums varies between industries. With Healthcare being the reference industry (where a one-point increase in ESG is associated with a $95.11 million increase in premium), we found statistically significant results confirming that ESG's impact on premiums does vary across industries. Namely, a one-point increase in ESG scores for Consumer Cyclicals, Financials, Real Estate, and Utilities, is associated with a lower

increase in premiums versus the Healthcare industry, indicating that better ESG scoring in Healthcare impacts the premium paid (in dollar terms) more positively.

For the final model, where we addressed the third research question, we also confirm that the impact targets' ESG scores have on premiums varies between regions, namely between the US and Europe. Although US acquirors are generally associated with paying lower premiums, a one-point increase in the targets' ESG scores is positively associated with the takeover premium for US acquirors, and negatively associated with the takeover premium for European acquirors. This seems to go against the fact that US acquirors see ESG investing with a more pessimistic lens. If US acquirors are more reticent regarding ESG investing and if they see it as a more risky operation, it would be expected that the premium US acquirors are willing to pay for a one-point increase in ESG scores is smaller than the one European acquirors (more optimistic regarding ESG investing) are willing to pay.

While the conclusions taken from this study seem to confirm that targets' ESG scores impact the takeover premium, it is important to keep in mind that upon the transaction sample merger with the ESG data, smaller targets were removed (for not returning values for ESG scores). This means that the analysis conducted here went from a group with an average target size of $2,025 million to a group with an average target size of $5,950 million (almost triple the value). Leaving smaller targets outside the analysis means that the relationships between targets' ESG and takeover premiums may not hold for targets with smaller market values. This can be something to be explored in the future, after studying smaller target firms' ESG practices.

Another limitation that can be explored in the future has to do with the CSR scores which present almost 50% of the observations with a score of 0 – which represents not firms that are non-disclosing, but firms that while publicly discussing these topics don't formalize reports and don't arrange committees. While this can be seen as a lack of variation, these observations contributed to the results found. Does this mean that, for CSR, publicly discussing these topics even if not in a formalized way, is already seen as something to be valued?

This study leaves room for further investigation with possible new relations between ESG matters and takeover premiums to be found. There can be other scores to be explored, new regions and industries, and new interactions between targets and acquirors' ESG scores and between industries and regions, to see if the different impact seen on industries is region-dependent or is felt worldwide.

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8. Appendix

8.1. Appendix 1 – Evolution of Number of Deals per Industry and Year

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Overall
Energy	2	5	2	1	4	6	6	5	7	4	6	4	4	6	62
Basic Materials	3	5	3	1	5	3	5	1	13	4	7	7	8	1	66
Industrials	5	5	2	0	3	5	4	9	8	14	7	9	5	3	79
Consumer Cyclicals	3	2	3	2	8	6	8	10	7	9	4	3	7	5	77
Consumer Non-Cyclicals	0	2	2	0	3	5	2	5	2	1	3	3	2	3	33
Financials	4	2	8	1	3	3	5	13	14	11	11	25	9	9	118
Healthcare	4	1	3	1	4	2	3	6	4	6	1	7	2	3	47
Technology	3	1	2	3	7	12	12	3	8	8	13	14	10	2	98
Real Estate	0	0	0	2	2	0	3	6	7	5	1	7	1	3	37
Utilities	4	7	0	0	1	3	3	3	3	1	3	2	0	1	31
Overall	28	30	25	11	40	45	51	61	73	63	56	81	48	36	648

8.2. Appendix 2 – Complete Table of Results from Model's 4 Regression

	(1)	(2)
Variables	Premium	Premium
ESG	111.06**	95.11***
	(44.29)	(32.68)
Energy	2,277.09	1,736.38
	-2,558.41	(1,862.87)
Basic Materials	2,833.43	2,278.69
	(2,534.25)	(1,860.24)
Industrials	3,145.60	2,616.59
	(2,554.39)	(1,840.04)
Consumer Cyclicals	4,317.91	3,236.37*
	(2,684.51)	(1,910.35)
Consumer Non-Cyclicals	4,444.17	3,514.57*
	(2,942.82)	(2,124.76)
Financials	3,066.79	2,587.11
	(2,488.39)	(1,811.44)
Technology	6,486.77***	763.23
	(2,454.89)	(1,778.65)
Real Estate	2,523.67	2,464
	(2,964.73)	(2,166.66)
Utilities	3,767.29	3,316.87
	(3,510.93)	(2,541.74)
ESG X Energy	-76.95	-60.94
	(58.72)	(43.24)
ESG X Basic	-76.26	-50.78
	(54.85)	(40.28)
ESG X Industrials	-85.27	-64.08
	(55.62)	(40.74)
ESG X Consumer Cyclicals	-110.59*	-79.10*
	(57.85)	(41.99)
ESG X Consumer Non-Cyclicals	-90.50	-59.84
	(64.00)	(48.04)
ESG X Financials	-103.27*	-74.60*
	(55.30)	(41.21)
ESG X Technology	-138.74**	-12.87
	(54.98)	(40.33)
ESG X Real Estate	-102.55	-90.63*
	(65.69)	(48.08)
ESG X Utilities	-133.77*	-117.21**
	(70.13)	(52.77)
Ln(Acquiror Market Value)	1,076.02***	948.40***
	(163.09)	(123.15)
EBITDA margin	18.93	17.46*
	(13.17)	(9.74)
Cash Payment	-974.74*	-605.34
	(518.86)	(384.25)
Tender Offer	-939.93	-853.60
	(618.60)	(522.25)
Constant	-12,354.89***	-7,485.39*
	(2,547.58)	(4,486.14)
Time Fixed Effects	No	Yes
Target Nation Fixed Effects	No	Yes
Observations	648	648
R-squared	12.61	62.43
Adjusted R-squared	9.39	56.98

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1