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Does ESG score affect M&A shareholder return?

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## Abstract

The purpose of the research is to investigate whether the market recognizes a potentially positive effect for the bidder's shareholders following a deal announcement that includes a target company with a higher ESG score than the bidder. This is investigated by performing an event study around the date of the announcement using a sample of 50 European and United Kingdom based companies for which matching data on the ESG performance of both target and bidder firms are available. Then, a variable is implemented within the analysis to compare the ESG scores of both the purchasing company and the target company. Results show that on average shareholders of acquiring companies report negative returns in periods around the announcement date although these are not statistically significant. Multivariate regression models show that investors expect higher value creation among companies reporting a higher degree of ESG relativity while no evidence is found when considering ESG score affinity.

# Introduction

## 1.1 Why does M&A happen?

The sale of a company or division is a significant occasion for the owners, management, staff, and other stakeholders of a company. It is a time-consuming, rigorous process that frequently lasts many months and carries major risks. The choice to pursue a merger or acquisition was driven by several generally acknowledged factors, according to the literature, despite the efforts of numerous authors and researchers over the years. As a result, there is dispute over the nature of the key factors as well as how and how much they affect M&A activity. The aim of this section is to briefly give primary justifications for M&A transactions and introduce the main features.

### 1.1.1 M&A motives

One of the main reasons why companies undertake M&A is synergies, which are defined as the incremental cash flows created by integrating two businesses. Synergies are mainly classified into two types in the professional world:

- operational synergies, which may play a significant role in the creation of shareholder wealth, include economies of scale, economies of scope, and the acquisition of complementary technical assets and capabilities. Efficiency increases can come from these factors recognized as cost synergies but also from revenues increase as a result of the combination of companies' operation, as well as enhanced management operating approaches (Depamphilis M., 2019);
- financial synergies, which consist of a reduction in the acquirer's cost of capital because of higher tax credits, which may be utilized to offset future profits made by the merged companies, profitability, and debt capacity benefits.

Secondly, diversification is one of the most pursued M&A motives. It enables a corporation to shift away from its primary product line and toward ones with more growth potential. Furthermore, because they have considerably lower investment rates than the targets they pursue, acquirers with restricted growth possibilities usually earn considerable cash flow, allowing them to finance takeovers with their excess cash flow (Levine, 2017). For example, a corporation suffering slower development in its existing markets may be able to boost growth through relevant diversification by selling its current products in relatively unexplored and hence riskier regions. Even though

diversification is an essential M&A driver, some authors observed that the most successful acquisitions include those that focus just on the acquirer's core firm, showing greater familiarity and the ability to optimize investment decisions. Because connected firms are more likely to save money due to overlapping duties, related acquisitions may even give higher financial returns than unrelated mergers primarily due to the existence of exploitable synergies (Singh & Montgomery, 1987).

Another well-recognized motivation in the literature and that historically has been confirmed is that corporations frequently use mergers and acquisitions to react to external developments, such as deregulation and technological advancement. For instance, some firms in severely regulated industries, such as financial and energy, are typically unable to effectively compete following deregulation, and hence become targets for stronger competitors. As a result, deregulation typically triggers a frenzy of merger and acquisition activity, resulting in a significant reduction in the number of competitors in the industry. Not to be outdone, also technological innovations create the need to restructure companies' structures, resulting in significant changes to continue to compete (Ovtchinnikov, 2013).

In addition to the previous, Figure 1 lists and summarizes the main reasons behind a merger and acquisition operation accordingly to the relevant literature. Besides the aforementioned, an imperfection in capital markets which leads to misvaluation of assets and managerial behavior, recognized in CEO Hubris and opportunistic behavior, seems to play a significant role in M&A motives literature.

Overall, for this purpose, it can be said that whatever the reason behind the M&A operation its announcement introduces new information about a firm to the market, and if the stock market is efficient, investors' views about this new information are promptly and fully reflected in share prices. If the transaction is predicted to provide synergies or to have a favorable influence on firms in general, the market will perceive it and respond favorably to the news. As a result, the anomalous return, which is the difference between the realized return and a benchmark return, may capture all the value produced by the M&A transaction in a brief event window surrounding the announcement date.

Theory	Motivation
Operating synergy <ul style="list-style-type: none"> <li>• Economies of scale</li> <li>• Economies of scope</li> <li>• Complementary technical assets and skills</li> </ul>	Improve operating efficiency through economies of scale or scope by acquiring a customer, supplier, or competitor or to enhance technical or innovative skills
Financial synergies	Lower cost of capital
Diversification <ul style="list-style-type: none"> <li>• New products/current markets</li> <li>• New products/new markets</li> <li>• Current products/new markets</li> </ul>	Position the firm in higher growth products or markets
Strategic realignment <ul style="list-style-type: none"> <li>• Technological change</li> <li>• Regulatory and political change</li> </ul>	Acquire capabilities to adapt more rapidly to environmental changes than could be achieved if they were developed internally
Hubris (managerial over confidence)	Acquirers believe their valuation of the target is more accurate than the market's, causing them to overpay by overestimating synergy
Buying undervalued assets (Q-ratio)	Acquire assets more cheaply when the market value of equity of existing companies is less than the cost of buying or building the assets
Managerialism (agency problems)	Increase the size of a company to increase the power and pay of managers
Tax considerations	Obtain unused net operating losses and tax credits and asset write ups, and substitute capital gains for ordinary income
Market power	Actions taken to boost selling prices above competitive levels by affecting either supply or demand
Misvaluation Investor	Investor overvaluation of acquirer's stock encourages M&As using stock

*Figure 1 - Common Theories of What Causes Mergers and Acquisitions (Depamphilis M., 2019)*

### 1.1.2 M&A waves

After having briefly discussed the main M&A determinant, another M&A deal recognized characteristic is that this kind of operation tends to cluster in the same period following a specific trend and market events. While the first ones were exclusively a US phenomenon, the 90s waves were more a worldwide event involving also continental Europe and the rest of the world such as Asia. The picture below shows the number of deals from 1980 to 2003 in the mentioned region.

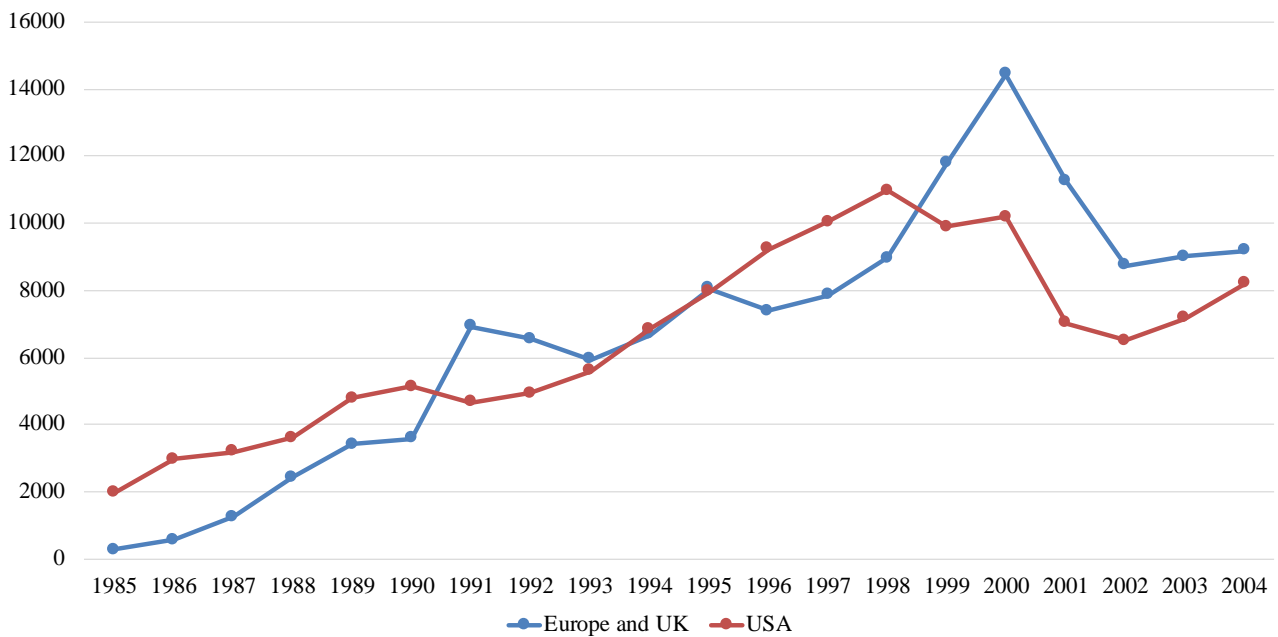


Figure 2 - Number of completed deals in Europe and the USA (Source: Refinitiv)

It is known in the literature that each takeover wave typically begins with several economic, political, and regulatory changes (Martynova & Renneboog, 2008) that trigger the reactivity of companies that perceive new opportunities and trends to be seized. Secondly, M&A comes in waves because of misvaluation and the inclination of managers to use overpriced stock to acquire assets from lower-valued firms. According to the argument, for M&As to occur in waves, the valuations of many firms must rise at the same time. So, managers whose stocks are thought to be overvalued seek to acquire firms whose stock prices are less valued (Rhodes-Kropf & Viswanathan, 2004). Moreover, even in the absence of industry shocks and misvaluation, easily available and low-cost capital may create a boom in M&A activity due to more accessible financing condition (Harford, 2005). For instance, the takeover wave which began in 1981, occurred after the stock market had recovered from the previous economic downturn and it coincided with changes in antitrust policy, financial services deregulation, the creation of new financial instruments and markets (for example, the junk bond market), and technological progress in the electronics industry. Furthermore, another takeover wave started around 1993 and grew in tandem with increasing economic globalization, technological innovation, deregulation, and privatization of state-held companies in continental Europe, as well as the international expansion of the economic and financial markets. Figure 2 shows how in the 1990s, the European takeover market was roughly the same size as the US counterpart. Secondly, in line with internalization, a considerable amount of M&As was cross-border transactions which highlight the

company's willingness to compete and survive in an expanded competitive environment enabled by globalization. The fifth wave came to an end because of the 2000 stock market crash<sup>1</sup>.

## 1.2 Environmental, Social, and Governance criteria, and Stakeholder value creation

Some academics have argued that corporations must sacrifice stakeholder interests to maximize shareholder value since firms are only socially accountable to their shareholders who have residual control and income rights, accordingly to the "Shareholder Value Creation" (Friedman, 2007). On the other hand, the notion of Stakeholder Value Creation suggests that businesses should fulfill their social responsibilities to all stakeholders and society (Freeman, 1984), (Porter & Kramer, 2006). On this side, corporate social responsibility (CSR) becomes popular and relevant around the '70s. It supports the premise that major corporations are powerful organizations that have a significant impact on people's quality of life, and as a result, they must consider the effects of their decisions on stakeholders and society. It has four areas of responsibility in total. First, a business must create goods and services to suit customer requirements while also remunerating its owners; second, corporations must follow the existing law and rules when seeking profit; and third, firms must make decisions by the community's expectations and moral standards and lastly, arbitrary, or voluntary initiative in support of the stakeholder or community to the degree of charitable acts it's crucial that businesses assess how their actions affect society. In this sense, the Three Ps paradigm (People, Planet, Profit) states that businesses should disclose their performance using three factors, which are frequently described as social, environmental, and economic performance (Zattoni, 2020). Furthermore, CSR refers to a set of actions that self-regulate the business makers to pursue societal goals of a philanthropic, activist, or charitable nature by engaging in or supporting volunteering or ethically oriented practices (Sheeny, 2015). It results from an awareness of how challenging it is to compare economic success, which is based on standardized and impartial metrics like accounting, to social and environmental performance. For these reasons, several players, including international and

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<sup>1</sup> The fall of the stock market coincides with the burst of the so-called "Dot.com" bubble that surrounded all the companies operating in the technology sector thanks to the spread of the Internet and its application.

governmental organizations, have begun to produce guidelines to drive businesses toward a common set of sustainability goals<sup>2</sup>.

Moreover, further attention has been paid by private investors and asset managers regarding the issues of Socially Responsible Investment (SRI) and Environmental, Social, and Governance (ESG) score screening affecting their investment decisions. ESG ratings are a set of guidelines for a company's behavior that are used to assess possible investments by socially aware investors. Environmental criteria consider how a corporation protects the environment, including corporate policies that address climate change. Social criteria look at how the company relates with its workers and value chain operators including the communities where it operates. Governance includes matters such as a company's management, executive compensation, audits, internal controls, and shareholder rights. If corporate social responsibility affects the behavior of firms and managers, ESG scores have been implemented by some rating agencies such as *MSCI* and *Sustainlytics*<sup>3</sup> as a tool in the hands of investors to distinguish companies' sustainability profiles and ranking. It is important to highlight that ESG ratings might be inaccurate shortcuts that might be wrong at the corporate level. At the portfolio or market level, where random mistakes may cancel each other out, they may make more sense. Even so, one should be wary of systemic mistakes (Schoenmaker & Schramade, 2019).

The relation between good ESG performance and firm performance is becoming more and more evident. There is mounting evidence that high sustainability performance is beneficial to value driver performance. For instance, (Ortiz-de-Mandojana & Bansal, 2016) showed that for a long period of 15 years, organizations that embrace stronger sustainability policies have reduced financial volatility, faster sales growth, and higher odds of survival demonstrating a performance improvement. Many authors have tried to investigate the impact of an enhancement in ESG on a firm's cost of capital but seem that the influence of sustainability on a company's cost of capital is less evident than the impact on sales growth and profitability. However, (El Ghoul, et al., 2011) found that organizations with higher sustainability ratings had lower equity financing costs in a broad sample of US enterprises. Their findings indicate that investing in developing responsible employer relations, environmental

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<sup>2</sup> In 2015, the United Nation issued 17 Sustainability Development Goals that every country should be addressing by 2030

<sup>3</sup> *MSCI* is a global leader in providing crucial decision support tools and services to the investing community operating also in ESG disclosure while *MorningStar Sustainalytics* is an independent ESG and corporate governance research, ratings and analytics firm that assist investment decisions.

policies, and product strategies have a significant impact. Furthermore, the expected positive effect between ESG performance and investors may be justified by considering that, that companies with stronger sustainability performance have better access to finance because increased stakeholder participation and transparency about sustainability performance are crucial in decreasing capital limitations (Cheng, et al., 2014).

## Literature Review and Hypothesis

This section is divided into two parts. The first section deals in general with the underlying theory of short-term value creation for M&A. The second instead regards the connection of financial performance with the ESG aspect.

### 2.1 Shareholder's return from M&As announcement

Merger and acquisition anomalous returns are largely situational, and several researchers have attempted to investigate the link between them and transaction features. Positive abnormal or excess shareholder returns, in the sense that they are considered extraordinary compared to what an investor might expect under normal conditions, may be explained by such factors as improved efficiency, pricing power, and tax benefits or by some implied deal features. In this sense, (Martynova & Renneboog, 2011) carry out an analysis of the performance of corporate takeovers involving European firms during the fifth takeover wave (1993-2001) and find that most takeover deals are expected to create synergies value which is mostly captured by the target firm's shareholders. Moreover, the research investigates the effect on both target and bidder shareholders' return of some deal characteristics such as geographic scope, attitude towards the bid, legal status of the target firms, industry relatedness, and means of payment. The research shows that the bidder's shareholders earned an abnormal return of 0,53% while the target's shareholders earn about 9,13% on the event day. Moreover, pre-bid cumulative abnormal returns (CAARs) analysis demonstrates that bidder and target price reactions begin more than two months before the acquisition announcement. Figure 3 shows that when price run-up is included, the CAARs rise to 20,62% for targets and 0,92 % for bidders. Lastly, after the event day, negative revaluations of the bidder and target share prices occur as shown in Figure 3.

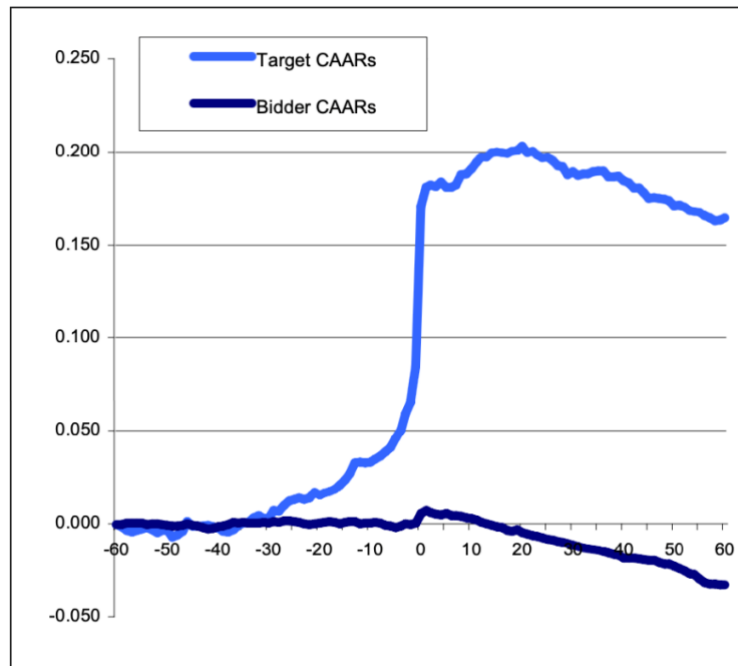


Figure 3 - Target and bidder CAARs around the M&A announcement, (Martynova et al., 2011)

Generally, evidence suggests that M&As provide value to the target firm's shareholders, as seen by considerably positive average abnormal returns following the announcement of the M&A. As a result, target business owners often benefit from such deals since the M&A transaction provides a premium return. Because acquiring business owners may earn minimal, negligible, or negative abnormal returns, the data on wealth growth for them is less apparent. Although the shareholders of the purchasing firm are not necessarily losers, they are certainly not great winners like the target firm shareholders (Kiyamaz & Baker, 2008). Therefore, in the literature, the impact of M&A announcements on bidder shareholders does not show a unique result. Most of the time, empirical evidence shows abnormal returns close to zero, either slightly positive (Moeller, et al., 2004) and (Yilmaz & Tanyeri, 2016), or slightly negative (Betton, et al., 2008), (Hackbarth & Morellec, 2008).

## 2.2 Effect of firm social behavior on M&A shareholder returns

Given the increased interest in this subject, recent research has sought to establish a link between social success and financial performance, while investors, as mentioned in the preceding section, are increasingly taking non-financial elements into account when making investment decisions. Acquiring a company with a strong ESG or CSR track record may boost corporate reputation and lower operating and corporate risks (Henisz, et al., 2019). It is logical to assume that the acquirer's ESG score, standing, and the business image will rise after purchasing a target with high ESG performance. The following part is a discussion of a few reasons why CSR performance might have an impact on M&A shareholder returns.

(Tampakoudis & Anagnostopoulou, 2020) test if an improvement in the acquirers' ESG performance increases their market value to determine the impact of acquiring targets with superior ESG performance on the acquirer in the premerger stage on the market value of the acquirer in the post-merger stage. The empirical analysis, based on a European company's sample, shows that both the market value, which is measured by Tobin's Q ratio, and the ESG performance of the acquirer increase in the post-merger stage following the acquisition of a target with higher ESG performance than that of the acquirer in the premerger stage providing evidence of a positive relationship. Thus, it's reasonable to think that the market will react positively to the announcement of this kind of deal.

Furthermore, (Feng, 2021) investigate the impact of the target's ESG score on the acquirer's post-M&A return of assets (ROA) change and stock price change by two methods. This research, similarly to the previous, studies how the acquirer's pre-M&A ESG level can influence the impact of the target's ESG score on the acquirer's performance change. The first method considers the impact of the target's ESG score on the acquirer's performance indicators resulting in the absence of a significant linear relationship. Then, the second method measures the impact of the target's ESG score on the acquirer's performance change for high-ESG acquirers and low-ESG acquirers separately. This time evidence shows that the increase of the target's ESG score will deteriorate the ROA of low-ESG acquirers but benefit the ROA of high-ESG acquirers at a 95% confidence level but the influence on acquirers' stock price change is not statistically significant. The authors conclude that a bidder should evaluate their ESG levels before a deal discussion because not always a higher target ESG scores turn into better results because of the potential cost of integration due to the differences in corporate system and strategic goals or, in general, corporate cultural similarity.

Then, (Jost, et al., 2022) place their research on the debate between stakeholder value creation and shareholder value creation focusing on the specific question of whether CSR influences M&A premia defined as the ratio of the offer price over the target share price four weeks prior announcement with CSR variable. Using an international sample composed of 22 countries, the authors compare the acquisition premium recognized in the transaction. Their finding demonstrates that acquirers' CSR performance does not affect M&A premia. They conclude that the influence of acquirers' CSR performance on M&A premia is not well explained by either the shareholder theory or the stakeholder theory alone, and from the perspective of the targets, they do not find that CSR performance has a substantial impact. Also, (Ung & Urfe, 2021) investigate ESG scores of targets and acquirers' effect on M&A deal premiums, starting from the fact that these deals happen substantially for two reasons: the synergies achievement and the market for corporate control. The authors, therefore, hypothesize that synergies that might be created from good ESG performance should be incorporated into the premium because ESG may be an indicator of compatibility between the target and the acquirer increasing the likelihood of realizing synergies. They find a positive relationship between the ESG score of the target and the acquisition premium meaning that, overall, a high ESG score can act as a booster of a deal's premia because improves the value of a firm by increasing its reputation which leads to customer-related benefits and so the return realized by the shareholders at the announcement should be higher.

Moreover, (Bereskin, et al., 2018) investigate the impact of company culture similarities on merger decision-making and performance by using the enterprises' corporate social responsibility features as a proxy for cultural similarity. The authors found evidence that culturally similar organizations are more likely to combine, and these mergers correspond to larger synergies, improved long-run operating performance, and fewer goodwill write-offs. The study supports the notion that CSR comprises a broad and diverse range of policies and commitments, and that consequently, variations in a firm's CSR policies may reflect variations in the needs and preferences of those stakeholders. Such distinctions might raise the cost of merging multiple stakeholders from two separate organizations. The findings indicate that mergers between companies with greater levels of CSR similarity are more likely and that CSR similarity is also positively correlated with synergies. The authors' sample demonstrates this by showing that mergers with significant CSR similarity between the parties are linked, on average, to combined announcement returns that are 3.5% higher. On this side also (Alexandridis, et al., 2016) demonstrate that deals with larger corporate cultural distance have lower acquirer cumulative abnormal returns (CARs) around the deal announcements and lower synergy returns. These findings support the "cultural conflicts" theory put forward in earlier work,

such as (Huang, 2018), and imply that the corporate culture gap is seen by the market as a barrier to successful post-acquisition integration. On the other hand, the effect on the long-term scenario is reversed. These results confirm their hypothesis in which they propose that firms with strong reputations for CSR are less likely to make deals that dissatisfy the company's stakeholders.

(Deng, et al., 2013) follow the debate about the impact of CSR on deals considering that the performance expectation is driven depending on whether we consider the stakeholder or shareholder value theory. According to the stakeholder value maximization view (Jenses, 2002), CSR activities have a positive effect on shareholder wealth because focusing on the interests of other stakeholders increases their willingness to support a firm's operation, including an acquisition, which increases shareholder wealth. This leads to the consideration that a high CSR acquirer gets a higher announcement return because the market recognizes the benefit. The authors' findings, which corroborate the stakeholder value hypothesis, provide compelling evidence that acquirers' CSR performance ratings have a large positive impact on their announcement stock returns, post-merger operating performance, and long-term stock returns.

Lastly, (Krishnamurti, et al., 2019) contribute to the previous literature by analyzing whether a firm's corporate social responsibility activities influence deal characteristics, target choice, and acquisition performance. Based on an Australian deals sample, the authors find that the CSR score of the bidding firm is positively associated with the possibility of choosing a corporation prone to CSR practices. This finding implies that bidders with good CSR performance select targets based on their CSR orientation, confirming the stakeholder value theory. This leads to positive and significant abnormal returns, also signaling that strong CSR firms pursue investment decisions also consistent with shareholders' wealth maximization objectives. It also confirms the precedent insight found by (Bereskin, et al., 2018) and (Deng, et al., 2013). Of course, this paper could present some limitations due to the consideration of only Australian-based firms in the sample.

# Data collection

As a measure of the returns resulting from the announcement for both the target shareholders and the bidders, the CAR identified through the methodology of the event study will be used. Then, multivariate regression models will be identified by inserting control and explanatory variables to identify the relationship between ESG scores and CARs

## 3.1 Sample Construction

The dataset containing quantitative information on MA deals is structured with the Advanced Search-Merger and Acquisition Database of Eikon Refinitiv (Thomson Reuters). Through this database, it is possible to obtain coverage of over 1.1 million deals since the 1970s including 350,000 US target and 750,000 non-US-target transactions. The initial sample will include takeover bids executed within the Eurozone and the UK between January 03, 2011, and December 31, 2021. Moving from the initial enlarged sample, I insert selection criteria to narrow the search field and improve the structure of the analysis.

The selected criteria are as follows:

- Reference M&A transactions included in the dataset are transactions completed before the end of the sample period;
- Both acquirer and target companies are publicly traded companies on a European stock market;
- The acquirer firm is included in the categories type of individual or corporate, excluding the financial buyers such as private equity funds;
- Companies included in the dataset are active at the European Union<sup>4</sup> and United Kingdom levels;
- To avoid the effects of a very small transaction it was considered only deal value higher than 50 million €.

### 3.1.1 Sample description

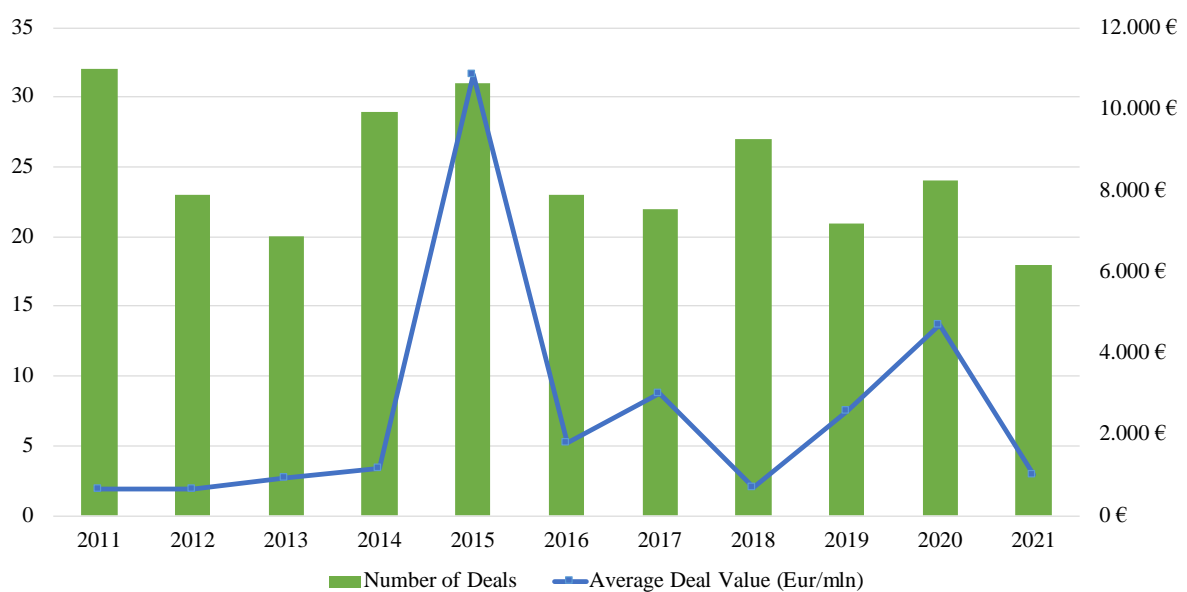
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<sup>4</sup> The list of 27 countries includes: Croatia, Bulgaria, Czech Republic, Hungary, Lithuania, Poland, Slovakia, Slovenia, Estonia, Belgium, Cyprus, Denmark, Finland, Germany, Greece, Ireland, Netherlands, Spain, Sweden, Romania, Austria, France, Latvia, Italy, Luxembourg, Malta, and Portugal.

From the download carried out on the platform of *Refinitiv Eikon Workspace*, it has been obtained a sample of transactions pairs to 4.343 that once eliminated all the buyers and the seller that did not turn out to be quoted on any European stock market has reached a total number of 270. Below are some tables and graphs that describe the characteristics of the companies involved in the selected transactions. Table 1 shows that the number of transactions is divided almost equally in all the years analyzed. The year where more transactions were made is 2011 with 32 (11,9% of total) deals while in 2015 there was an average value of 10.839 Eur/mln, higher than the average of all years.

<b>Deal Announcement</b>	<b>Number of Deals</b>	<b>Percentage of total</b>	<b>Average Deal Value (Eur/mln)</b>
2011	32	11,9%	640
2012	23	8,5%	670
2013	20	7,4%	938
2014	29	10,7%	1.169
2015	31	11,5%	10.840
2016	23	8,5%	1.780
2017	22	8,1%	2.998
2018	27	10,0%	700
2019	21	7,8%	2.580
2020	24	8,9%	4.688
2021	18	6,7%	991
<b>Total</b>	<b>270</b>	<b>100%</b>	<b>2.545</b>

*Table 1 - Breakdown of transactions by year and by average annual value of deals*



*Figure 4 - Transactions by year and by average annual value of deals*

Moreover, table 2 shows the breakdown by macro industry of buyers and target companies. In the analyzed period, the more active category on the market has turned out to be the *Financials* with 40 acquired societies followed by *Real Estate* and *Industrials* firms

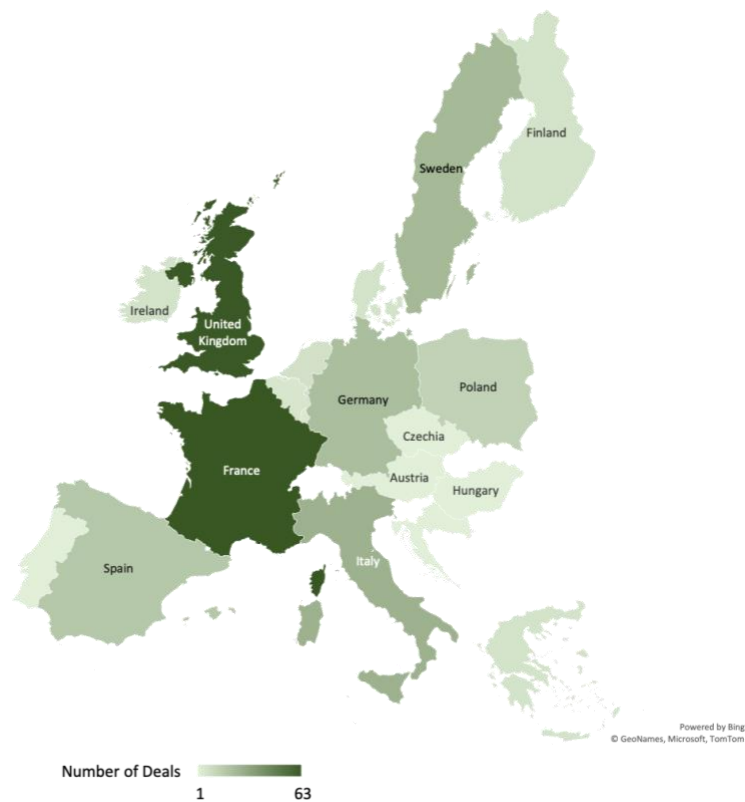
<b>Industry</b>	<b>Number of Acquirers</b>	<b>Number of Targets</b>
Consumer Products and Services	8	13
Consumer Staples	9	10
Energy and Power	29	22
Financials	48	50
Healthcare	25	21
High Technology	15	23
Industrials	40	40
Materials	13	11
Media and Entertainment	24	16
Real Estate	41	43
Retail	13	14
Telecommunications	5	7
<b>Total</b>	<b>270</b>	<b>270</b>

*Table 2 - Acquirers and Target industries breakdown*

Furthermore, the geographical split of the deals is displayed in Tables 3 and 4. As it was possible to imagine, the deals were concentrated in the largest and wealthiest European countries where there are certainly more developed and elaborate markets for corporate control and stock market than in the smaller European countries. The country with the highest registered number of deals is France followed by the United Kingdom and Italy.

<b>Acquirers Country</b>	<b>Number of Deals</b>	<b>Percentage of Total</b>	<b>Average Deal Value (Eur/ mln)</b>
Austria	1	0,4%	78
Belgium	5	1,9%	20.008
Croatia	1	0,4%	171
Czech Republic	1	0,4%	1.274
Denmark	6	2,2%	298
Finland	6	2,2%	3.029
France	63	23,3%	2.081
Germany	21	7,8%	2.126
Greece	6	2,2%	1.016
Hungary	1	0,4%	248
Ireland	6	2,2%	1.116
Italy	26	9,6%	982
Luxembourg	4	1,5%	33.081
Netherlands	7	2,6%	1.513
Poland	13	4,8%	618
Portugal	1	0,4%	93
Spain	17	6,3%	820
Sweden	23	8,5%	785
United Kingdom	62	23,0%	3.518
<b>Total</b>	<b>270</b>	<b>100%</b>	<b>3.834</b>

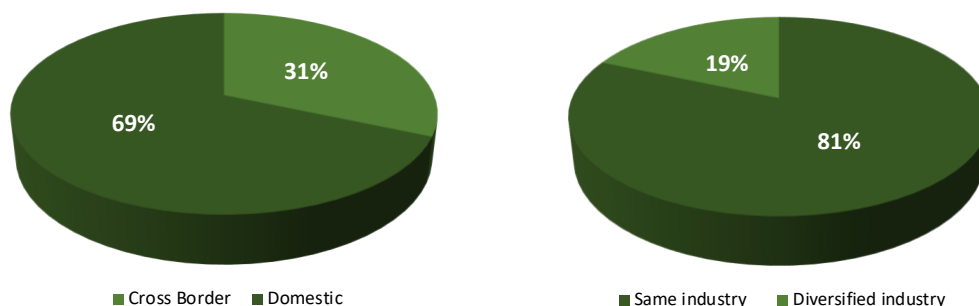
*Table 3 – Number of deals by acquirers' country*



*Figure 5 – Deal distribution map*

Lastly, 85 transactions within the sample took place outside national borders corresponding to 31% of the total, and 185 transactions within the national market accounted for 69%. Moreover, from the

strategic point of view, most acquisitions took place within the same macro industry with 220 deals (81%) while transactions made in a diversified sector amounted to 50 (19%), meaning that the market could recognize a greater value and benefits from deals that happen in the same industry thanks to the experience gained and the fewer integration difficulties



*Figure 6 - Deals localization and relative industries*

### 3.1.2 ESG data collection

Once the sample of companies as described above was selected, the ESG scores were associated with the companies involved in the individual transactions. Refinitiv was used as the reference provider, which covers 80% of global market capitalization across more than 630 different ESG metrics, with historical data dating back to 2002 (Refinitiv, 2022). Scores account for company size and transparency since firms are scored based on rank and therefore are not very sensitive to outliers. ESG scores are generated and provided for all firms and past fiscal periods in the ESG worldwide coverage, i.e., for nearly 1,000 corporations dating back to the fiscal year 2002. Refinitiv retrieves its data from annual reports, company websites, nongovernmental organization websites, stock exchange filings, CSR reports, and news sources. These data are collected and processed to generate ESG metrics which undergo a careful process to standardize the information and grant similarity throughout the whole spectrum of businesses. In addition, the database is constantly updated following corporate reporting trends, and data on goods is refreshed once a week, including the recalculation of ESG ratings.

#### ***ESG Score structure***

The score structure is based on over 630 company-level ESG measures, which are captured and calculated by Refinitiv, with a subset of 186 of the most comparable and material per industry speeding up the entire company evaluation and scoring process (Refinitiv, 2022). These are broken down into ten categories that reformulate the three pillar scores as well as the final ESG score, which

is based on information that is readily available and shows the company's performance, commitment, and effectiveness concerning ESG. The 10 categories are listed below:

- Environmental: Resource use, Emissions, Innovation
- Social: Workforce, Human Rights, Community, Product Responsibility
- Governance: Management, Shareholders, CSR strategy

The scores from each area are combined to form three pillar scores: environmental, social, and corporate governance. The ESG pillar score is a relative sum of the category weights for the environmental and social categories, which vary by industry (Refinitiv, 2022) with exception of governance’s weights which stay consistent across industries.

Each category within the three pillars, as well as the pillars themselves, are assigned weights based on their relative importance bearing in mind that also weights differ depending on the industry or country. The percentile rank is computed as follows:

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

Equation 1 - Categories score calculation methodology (Source: Refinitiv)

Then, the pillar weights are converted to percentages ranging from 0 to 100 based on the reported table.

Score range	Grade	Description
0.0 <= score <= 0.083333	D -	'D' score indicates poor relative ESG performance and insufficient degree of transparency in reporting material ESG data publicly.
0.083333 < score <= 0.166666	D	
0.166666 < score <= 0.250000	D +	
0.250000 < score <= 0.333333	C -	'C' score indicates satisfactory relative ESG performance and moderate degree of transparency in reporting material ESG data publicly.
0.333333 < score <= 0.416666	C	
0.416666 < score <= 0.500000	C +	
0.500000 < score <= 0.583333	B -	'B' score indicates good relative ESG performance and above-average degree of transparency in reporting material ESG data publicly.
0.583333 < score <= 0.666666	B	
0.666666 < score <= 0.750000	B +	
0.750000 < score <= 0.833333	A -	'A' score indicates excellent relative ESG performance and high degree of transparency in reporting material ESG data publicly.
0.833333 < score <= 0.916666	A	
0.916666 < score <= 1	A +	

ESG laggards

ESG leaders

Figure 7 - Score range conversion table (Source: Refinitiv)

Considering the method of calculation of scores by Refinitiv, (Dorfleitner, et al., 2015) discover no scoring convergence across the three major ESG score providers (MSCI, Refinitiv, and Bloomberg). This study emphasizes the previous argument because providers come to various conclusions for the same businesses. Some variations may be explained by the suppliers' rating algorithms. These also reduce transparency and make determining whether scores reflect reality difficult. I make use of Refinitiv data since their current and historical coverage is more extensive than that of most other sources as much previous research have done such as (Krishnamurti, et al., 2019) and (Jost, et al., 2022).

### ***Final sample selection***

The comparison of the ESG data available from the company screener tool on the *Eikon Workspace Refinitiv* with the companies included in the sample resulted in a reduction of the latter to 50 available transactions. The ESG score considered is the value available in the year in which the transaction took place for both the target and bidder company. Table 4 displays some summary statistics of the new sample and the ESG scores are summarized.

<b>Country</b>	<b>N of deals</b>	<b>% of total</b>	<b>Avg deal value (Eur/mln)</b>
Czech Republic	1	2%	1.273,53 €
Spain	6	12%	1.168,78 €
France	12	24%	4.141,56 €
Sweden	4	8%	1.908,02 €
Finland	3	6%	5.489,14 €
Italy	3	6%	1.807,56 €
Germany	6	12%	4.449,55 €
United Kingdom	10	20%	9.250,08 €
Poland	2	4%	1.871,40 €
Ireland	2	4%	2.070,21 €
Greece	1	2%	543,82 €
	50	100%	

*Table 4 - Number of deals and average deal value by countries after ESG score matching*

As a major consequence of the numerical change in the sample due to the availability of ESG scores, the number of countries where transactions have taken place has decreased to 11 instead of 28. Most deals took place in countries with highly developed stock markets such as the UK and France. This, as stated in the previous section, is in line with the data obtained before matching with ESG scores.

<b>Industry</b>	<b>Number of Acquirers</b>	<b>Number of Targets</b>
Consumer Products and Services	2	3
Consumer Staples	-	1
Energy and Power	10	7
Financials	10	10
Healthcare	2	1
High Technology	1	3
Industrials	7	11
Materials	1	-
Media and Entertainment	7	4
Real Estate	6	6
Retail	3	2
Telecommunications	1	2
<b>Total</b>	<b>50</b>	<b>50</b>

*Table 5 - Bidder and target companies by industry after ESG score matching*

The dispersion of deals by industry has not varied much. The most active sector was the financial one with 10 transactions and unlike the first sample, the power and energy sector registers 10 transactions.

<b>Deal Geographical scope</b>		<b>Industry relatedness</b>	
Domestic	34	Same industry	38
Cross Border	16	Diversified industry	12
<b>Total</b>	<b>50</b>	<b>Total</b>	<b>50</b>

*Table 6 - Deal internationally and industry relatedness after ESG score matching*

As for the subdivision by sectors, nor has the division of deals by nation changed in general. As with the previous sample of transactions, most deals took place within national borders. The same applies to the relative classification of sectors. Most transactions took place within the same industry.

Lastly, summary statistics of ESG data downloaded from the Refinitiv ESG database are reported in table 7. These data are mainly used to create the variable that measures the ESG score similarity

between acquirer and target which will be described in the next sections. The mean score for the target is 64,3, while it is 54,1 for acquirers. Both have significant dispersion which is measured by the standard deviation which is estimated to be about 19%.

<b>ESG Score</b>	<b>Obs</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
Target	50	64,3	18,9	15,8	92,2
Acquirer	50	54,1	18,9	13,7	87,4

*Table 7 - Acquirer and Target ESG score (Source: Refinitiv)*

## Methodology

This section discusses the two approaches utilized to evaluate the research hypotheses: event study and multivariate regression analysis.

### 3.1 Event study

The following section briefly discusses the theoretical assumptions that underlie the methodology of the event study and the formulas used to perform the calculations.

#### 3.1.1 Methodology hypothesis

It is well known that according to finance theory, stock prices for companies represent all information that is currently accessible about such companies. Given this fundamental tenet, one may examine how a specific event, like an M&A transaction, alters a firm's prospects by measuring the effect of the event on the firm's stock (Schimmer, et al., 2014). Event studies analyzing share price changes on the day of the takeover announcement are the dominant approach to measure takeover profitability (Martynova & Renneboog, 2011). This assumes that an M&A announcement provides additional information to the market about the bidder and target businesses, causing investors to revise their assumptions about the firm's future earnings, which is subsequently reflected in the share price, as was said at the end of section 1.1.1. If the stock market is functioning properly, investors' expectations about this new information are instantly and completely reflected in share prices. If the

deal is expected to generate synergies or generally have a positive impact on companies, the market will recognize it and react positively to the announcement. As a result, the abnormal return, which is the difference between the realized return and a benchmark return, may capture all the wealth generated by the M&A transaction in a brief event window encompassing the announcement date. It is vital to note that the event analysis technique assumes that financial markets are efficient, which means that asset prices reflect all available information (Fama, 1970).

Moreover, measuring M&A value creation through event studies requires two additional assumptions, namely, the absence of two effects: “anticipation”, meaning that the bid is not anticipated, and “contamination” which means that the bid announcement is not contaminated by other information on the stand-alone value of the firms involved. Regarding the first assumption, anticipation can severely complicate the estimation of gains from bidding and should be considered to avoid underestimating the value implications, implying that the overall economic impact of an acquisition attempt is generally larger and more significant than the estimated announcement effect (Golubov, et al., 2013).

### 3.1.2 Formulas and Rationale

Event studies measure the economic impact of an event in the form of abnormal returns. Abnormal returns are computed by subtracting the returns that would have been realized if the investigated event had not occurred from the stock's actual manifested returns. While actual returns may be observed empirically, normal returns must be approximated. The event study approach utilizes anticipated return models, which are widely used in other fields of finance research and will be discussed in the next section.

The actual returns for the market and the bidder company are estimated using the natural logarithm of daily returns:

$$R_{i,t} = \ln\left(\frac{P_t}{P_{t-1}}\right)$$
$$R_{m,t} = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

*Equation 2 - Daily return for market index and bidder firm*

Where  $P_T$  represents the closing price of the current day and  $P_{(t-1)}$  depicts the closing price of the previous day. Using daily return is considered optimal to improve test results (Brown & Warner, 1984).

The market model is frequently used as expected return model (Schimmer, et al., 2014). The market model is a statistical model that compares the performance of each asset to the performance of the market portfolio. The anticipated joint normality of asset returns leads to the model's linear specification (MacKinlay, 1997). The following equation describes the model formally:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t}$$

*Equation 3 - Market model*

where and are the period  $t$  returns on security  $i$  and the market portfolio, respectively and  $m$  is the reference market. This analysis, it is employed a European-wide index including company companies from UK, Eurozone, and Scandinavia which is recognized in the *Stoxx 600* which includes 600 large, mid, and small-cap companies<sup>5</sup>. Moreover, to expand the scope of the research, the analysis is also conducted with the reference country market index<sup>6</sup>. The  $\alpha$   $\beta$  parameters are estimated in an estimation window set as [-140, -20], 140 days before the announcement to 20 days before the announcement, where transaction announcement (or event day) is considered as day 0. In this way is possible to avoid estimating the return of the market in the period around the announcement of the transaction avoiding incurring bias and underestimating the abnormal returns. Many previous studies have adopted this methodology. For example, (Krishnamurti, et al., 2019) used a period of estimation of (-261,-60) while (Yen & André, 2019) implemented an estimation window of (-120,-31). Therefore, it is considered a best practice that estimation and the event window do not overlap so as not to affect the estimate (MacKinlay, 1997).

The abnormal return on a distinct day within the event window represents the difference between the actual stock return, where  $i$  is the single stock, on that day, and the normal return, which is predicted based on the market model. The following equation describes abnormal return formally:

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t})$$

---

<sup>5</sup> For more information and details <https://www.stoxx.com/index-details?symbol=SXXP>

<sup>6</sup> The list of market indices of the reference countries can be found in the Appendix section.

*Equation 4 - Abnormal return (AR)*

In the above equation, subscript  $i$  and  $t$  refer to the bidder company involved in the deal and day respectively.

To measure the total impact of an event over a particular interval named an event window, one can add up individual abnormal returns to create a cumulative abnormal return (CAR) (Schimmer, et al., 2014). In this analysis and the event window is set at [-10,10], [-5, +5], [-2,+2], and [-1,1], all day notation is relative to the event date which corresponds to day 0. The day before the announcement is included to capture price changes caused by information leaks while incorporating the trading days after the announcement allows for any delays in stock price reaction. As indicated by the wide range of starting dates in published studies, there is no agreement on the start of the era for measuring short-term wealth impacts. On the one hand, the measurement error may be significant when employing small event windows, especially if the information was leaked before the first mention in the financial press. On the other side, there is evidence that bids are triggered by favorable changes in the acquirer's stock price. As a result, there is a risk that by commencing the measuring period too soon, the real M&A returns would be exaggerated. The following equation displays the CAR calculation:

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t}$$

*Equation 5 - Cumulative Abnormal Return (CAR)*

Where  $t_1$  represents the start of the event window and  $t_2$  the ending of the window.

The CARs can be further aggregated across all securities to get the Cumulative Average Abnormal Return (CAAR), useful to test for the overall market reaction to the event of interest:

$$CAAR = \frac{1}{N} \sum_{i=1}^N CAR(t_1, t_2)$$

*Equation 6 - Cumulative Average Abnormal Return (CAAR)*

Where  $N$  represents the number of the securities considered in the sample. Overall, positive CAAR values indicate that the outcome will reward the owners of the firm under consideration. Negative numbers signify that the outcome will have no or a negative impact on the company's value.

Moreover, a cross sectional t-test is performed to assess the significance of CAAR as performed by (Piperni, 2020) where the null hypothesis states that the average of the CARs is equal to zero,  $H_0: CAAR = 0$ . The test statistic is given by:

$$t_{CAAR} = \frac{CAAR - 0}{\widehat{\sigma}_{CAAR} / \sqrt{N}} \sim t_{n-2}$$

With:

$$\widehat{\sigma}_{CAAR} = \sqrt{\frac{1}{N-1} \sum_{i=1}^N (CAR_i - CAAR)^2}$$

*Equation 7 - Test statistic*

## 3.2 Regression Analysis

Multivariate regression analysis is undertaken to further evaluate the influence of social performance on M&A value generation and to untangle its impact on other value drivers. The estimated CARs serve as the dependent variable, while some deal-specific and financial parameters serve as explanatory variables.

### 3.2.1 Regressions model and statical assumptions

The following are the models of multivariate regressions. For the divers, they are considered the same dependent variable, but they have been applied to the different CAR that varies according to the temporal window considered. The coefficients are estimated using Ordinary Least Squares (OLS) performed by using STATA and Microsoft Excel. Before proceeding to the estimation of the OLS, it was checked some statical assumptions, such as homoscedasticity and multicollinearity which results are reported in the Appendix. If there is a presence of heteroscedasticity in the sample, the variance varies depending on the value of the explanatory variable, which contradicts the assumption and renders the OLS estimators inaccurate owing to bias (Saiwan & Chetty, 2018). When one explanatory variable in a multiple regression model has a strong correlation with one or more other variables, the issue of multicollinearity then becomes apparent. This can be a concern since it underestimates the statical importance of a variable making the related regression coefficients unstable and less meaningful (Saiwan & Choudhury, 2018). Roughly, both (White, 1980) and (Breusch & Pagan, 1979)

tests for heteroscedasticity do not show a critical value to reject the null hypothesis, and the variance-inflation factor, or *VIF*, shows an average value of about 1,51 indicating the absence of multicollinearity. These results it is also confirmed by the correlation matrix which is reported in the next section.

The regression models are hereinafter reported.

$$\begin{aligned}
 \text{Model}_1: \text{CAR}(-10,10)_i & \\
 &= \beta_0 + \beta_1(\text{ESG Relativity})_i + \beta_2(\text{Cash Deal})_i + \beta_3(\text{Cross Border})_i \\
 &+ \beta_4(\text{Relative Industry})_i + \beta_5(\text{Friendly})_i + \beta_6(\text{Ln Deal Value})_i \\
 &+ \beta_7(\text{Ln Relative Size})_i + \beta_8(\text{Leverage})_i + \beta_9(\text{Financial Bidder})_i + \epsilon_i
 \end{aligned}$$

$$\begin{aligned}
 \text{Model}_2: \text{CAR}(-5,5)_i & \\
 &= \beta_0 + \beta_1(\text{ESG Relativity})_i + \beta_2(\text{Cash Deal})_i + \beta_3(\text{Cross Border})_i \\
 &+ \beta_4(\text{Relative Industry})_i + \beta_5(\text{Friendly})_i + \beta_6(\text{Ln Deal Value})_i \\
 &+ \beta_7(\text{Ln Relative Size})_i + \beta_8(\text{Leverage})_i + \beta_9(\text{Financial Bidder})_i + \epsilon_i
 \end{aligned}$$

$$\begin{aligned}
 \text{Model}_3: \text{CAR}(-2,2)_i & \\
 &= \beta_0 + \beta_1(\text{ESG Relativity})_i + \beta_2(\text{Cash Deal})_i + \beta_3(\text{Cross Border})_i \\
 &+ \beta_4(\text{Relative Industry})_i + \beta_5(\text{Friendly})_i + \beta_6(\text{Ln Deal Value})_i \\
 &+ \beta_7(\text{Ln Relative Size})_i + \beta_8(\text{Leverage})_i + \beta_9(\text{Financial Bidder})_i + \epsilon_i
 \end{aligned}$$

$$\begin{aligned}
 \text{Model}_4: \text{CAR}(-1,1)_i & \\
 &= \beta_0 + \beta_1(\text{ESG Relativity})_i + \beta_2(\text{Cash Deal})_i + \beta_3(\text{Cross Border})_i \\
 &+ \beta_4(\text{Relative Industry})_i + \beta_5(\text{Friendly})_i + \beta_6(\text{Ln Deal Value})_i \\
 &+ \beta_7(\text{Ln Relative Size})_i + \beta_8(\text{Leverage})_i + \beta_9(\text{Financial Bidder})_i + \epsilon_i
 \end{aligned}$$

The inclusion of a specific variable was based on previous literature that demonstrated a relationship between the abnormal return and the same variables. The description and statistic summary for each variable considered is hereby reported. The data implemented for the computation of each variable were downloaded from *Refinity Workspace*.

<b>Variable Name</b>	<b>Definition</b>
ESG Relativity	The natural logarithm of the ratio between Target ESG Score and Bidder Esg Score
Cash Deal	1 if cash was used as consideration
Cross Border	1 if deal took place outside national border
Relative Industry	1 if Bidder and Target belong to the same macro industry
Friendly	1 if the deal was negotiated between the parties
Ln Deal Value	Natural logarithm of the deal value (Eur/mln)
Ln Bidder size	Natural logarithm of bidder market capitalization measured one-month before the event day
Leverage	Ratio between the net financial position and the bidder market capitalization one month before the event day
Financial Bidder	1 if the bidder is a bank or other financial institution

*Table 8 - Variable description*

### ***ESG Relativity***

The primary objective of the research is to determine whether the acquisition of a target with higher ESG performance influences the reaction of the market measured through the various CAR. According to the previous literature, *ESG relativity* allows verifying the presence of a positive reaction in the market and therefore the greater creation of implicit value when acquiring a target with a higher score than the bidder. It is calculated as the ratio between the ESG performance of targets and the acquirer's ESG score (Tampakoudis & Anagnostopoulou, 2020) in the year when the transaction took place. In this analysis, the natural logarithm of the ratio has been implemented to improve the result and the overall significance of the coefficient. In econometric literature, transforming data in their natural logarithm allows for improvement of the fitting of the linear relationship. In addition, logarithmic transformations are also useful for changing a severely skewed variable into one that is more normal and to achieve constant variance (Benoit, 2011). In this way, it is possible to better discern the score's relativity: extreme values (very high or very low) will represent companies with different ESG Scores, while values close to zero will represent companies with similar ESG Scores. By setting the variable this way, you can determine the impact of ESG Score relativity on abnormal returns recorded at the time of announcement of M&A operation.

### ***Cash Deal***

The manner of payment is a crucial consideration in mergers and acquisitions since it has a major influence on the returns of both the target and bidder businesses. The method of payment utilized offers a signal to the market regarding knowledge the bidders' management has about the worth of their business, as the management of the bidding firm should prefer to employ the lowest payment

option (Giannopoulos, et al., 2017). For example, the bidding firm's management may choose to finance an M&A using shares if the firm's shares are overvalued in the market; otherwise, cash would be the preferable means of financing an M&A because it is considered the cheapest. Therefore, the decision of whether to accept a bid that includes cash or equity contributions may be affected by the asymmetry of knowledge between the bidder's management and outside investors regarding the bidder's market valuation. This is also consistent with many US studies which accept that all equity-financed acquisition announcements relate to highly negative anomalous returns on bidders' shares and that these takeovers dramatically underperform all-cash offers while European-based study shows different results. For instance, (Goergen & Renneboog, 2004) shows that bidders' CAARs in all-equity deals significantly exceed those in all-cash deals (1% vs 0.4%) signaling that making an all-equity offer does not imply the market that the bidder's stock is undervalued but that the market could recognize the benefits of sharing with the target the success risk of the operation.

### ***Cross Border***

Bidding (and target) firms in cross-border mergers and acquisitions are likely to benefit from exploiting imperfections in international capital, factor, and product markets, internalizing foreign target companies' R&D capacity; and expanding their businesses into new markets (as a response to globalization). Because any of these synergies are inaccessible to local M&A businesses, the takeover wealth impact may be bigger in cross-border transactions. On the other hand, contends that legislative and cultural differences between the bidder and target nations may cause challenges in the post-merger consolidation process, hence failing to realize the anticipated merger synergies. Because of the anticipated challenges in cross-border offers, the market may depreciate the planned takeover. In this field (Martynova & Renneboog, 2011) analyze a sample of 2429 European deals involving 28 European countries and find that the impact on bidder announcement return depends on the target corporate governance model indeed they find that bidding firms of German, Scandinavian, and French legal origins earn higher announcement returns (on average 0.50%) than firms of English legal origin (0.18%). Furthermore, the regulations governing takeovers vary greatly amongst member countries. Corporate takeover pills and other similar safeguards are commonly used to protect incumbent management. Governments also have the significant ultimate influence over who owns some major corporations using golden shares and other regulatory and antitrust restrictions before the approval of massive mergers and acquisitions. (Campa & Hernando, 2004) find that the sign of the difference in average cumulative abnormal returns between national mergers and cross-border deals diverges between targets and acquirers. In the case of targets, average cumulative abnormal returns

are found to be larger in cross-border deals while in the case of acquirers' average cumulative abnormal returns are larger in a national transaction.

### ***Relative Industry***

As described in section 1.1.1, diversification is one of the main recognized M&A drivers across time but its impact on shareholder value creation is ambiguous. Due to the utilization of strategic synergies, merger announcements between companies in the same industry are typically seen as being more value-generating than acquisitions that suggest diversification efforts. In this regard (Kiymaz & Baker, 2008) tests the industry relatedness to study whether a merger aims to take advantage of synergies and implements a dummy variable if both acquirer and target are in the same industry. Theoretically, if both are engaged in similar activities, the new entity may create value by replacing the inefficiency. They find that a large positive return for the target firm is correlated to the bidder operating in a related industry. In addition, they find that abnormal return varies over industries highlighting that announcement of large M&As results in statistically significant returns only in certain industries. In this context, the **Financial Bidder** dummy variable is implemented in this analysis to control for the particularities of this industry which is the subject of regulatory measures by national legislators. This might imply that the bidder is likely to seek only lucrative acquisitions, but regulatory permission is necessary, which increases the time required and the cost of the purchase. Moreover, (Bruner, 2005) in its survey research argues that generally, study findings on whether strategic relatedness explains buyer returns are mixed: eight studies show that relatedness is a major component in buyer returns, whereas four studies find no relevance. Based on the data in this area, it is acceptable to infer that the degree of relatedness does important, but in ways that are more nuanced than even a variety of studies can convey.

### ***Deal negotiation environment***

The definition of a merger offer as hostile is not an exogenous event and normally reflects part of the negotiating process between the target and acquirer (Schwert, 2002). However, the academic research makes advantage of this differential to highlight potential benefits from hostile takeovers that arise from removing existing managers (Campa & Hernando, 2004). The buyer's attitude to the target is determined by the target's management's level of entrenchment. Mergers are often amicable transactions conducted between the senior executives of the buyer and target companies. Hostile bids, on the other hand, are structured as take-it-or-leave-it proposals presented directly to the target firm's shareholders and are frequently perceived as forceful by target management. In the specific, higher

target return are associated with hostile deals than friendly negotiations because bidders may increase the original bid to close the deal. Given these considerations, a higher bidder return is expected for friendly deals.

### ***Deal Value and Bidder Size***

Deal value and bidder size are control variables at the firm level. The size of the deal may be thought as a proxy of the complexity of the operation and therefore the risk of its success (Feng, 2021). In the same way, the size of the bidder proxied as the natural logarithm of market cap measured 30 days before the announcement date (Alexandridis, et al., 2016) helps better understand the complexity of the deal and partially justify the initial share price reaction to the transaction. For instance, if relatively small companies undertake a large deal, this could be perceived as too risky hence bidder shareholders will experiment a negative reaction. On the other hand, the larger acquirer could overpay in the takeover and the size of the bidder may be considered as a proxy for managerial hubris (Roll, 1986) so the market may react negatively.

### ***Leverage***

Lastly, a strong correlation between the takeover returns and the bidder's cash flows and leverage is expected, as these factors should help identify acquisitions motivated by free cash flow. High cash flow and low leverage bidders are more inclined to undertake acquisitions that reduce the market value because of agency cost (Jensen, 1986). In this regard, a leverage control variable is implemented as the ratio between the bidder and lastly reported net debt and equity market value 30 days before the acquisition date.

## 3.2.2 Variable summary statistics and correlation matrix

Variable Name	Unit	Obs	Mean	Std. Dev.	Min	Max
ESG Relativity	Number	50	-0,194	0,462	-1,364	1,044
Cash Deal	Dummy	50	0,480	0,505	0,000	1,000
Cross Border	Dummy	50	0,320	0,471	0,000	1,000
Relative Industry	Dummy	50	0,760	0,431	0,000	1,000
Friendly	Dummy	50	0,940	0,240	0,000	1,000
Ln Deal Value	Eur/mln	50	7,531	1,282	4,455	11,073
Ln Bidder size	Eur/mln	50	9,149	1,467	5,041	12,110
Leverage	Debt/Equity	50	0,313	0,406	0,000	1,359
Financial Bidder	Dummy	50	0,200	0,404	0,000	1,000

Table 9 - Summary Statistics

Table 9 shows the summary statistics of the considered variable. *Cash Deal*, *Cross Border*, *Relative Industry*, *Friendly* and *Financial Bidder* are expressed as dummy variables hence they range from a value of 0 to 1. For instance, 48% of the transaction were paid in cash while only 38% of deals took place outside the national border. Furthermore, most negotiations were undertaken in a friendly environment (94%) and 76% of the deals have taken place in the same sector indicating a preference for horizontal integration. For what concern the other control variable, *Ln Bidder size* has a wide dispersion from a value of 5,041 to a value of 12,110 with an average of 9,149. Likewise, *Ln Deal Value* reports an average of 7,531, ranging from a value of 4,455 to 11,073. Both variables reported a high value of standard deviation.

The following table shows the correlation between the all variable used in the models. According to (Pallant, 2005) if correlations exceed -0.5 or 0.5 indicates moderate multicollinearity, and if the correlation level exceeds -0.7 or 0.7 it indicated a high correlation. As it is possible to see, only a few variables reported correlation variables near -0,4 or 0,4 so it is permissible to conclude that the level of multicollinearity should not be such as to induce statistical errors and that the variables included in the model do not show correlation problems. This is in line with the outcome of the *VIF* analysis carried out in the previous section.

	<i>ESG Relativity</i>	<i>Cash deal</i>	<i>Crosss Border</i>	<i>LN Bidder Size</i>	<i>Relative Industry</i>	<i>Friendly</i>	<i>Ln Deal Value</i>	<i>Leverage</i>	<i>Financial Bidder</i>
ESG Relativity	1								
Cash deal	-0,2286	1,0000							
Crosss Border	-0,0937	0,1133	1,0000						
LN Bidder Size	-0,2090	0,4336	0,0473	1,0000					
Relative Industry	0,1344	0,0712	-0,1165	-0,0620	1,0000				
Friendly	-0,0870	0,2427	-0,0072	-0,1004	-0,1420	1,0000			
Ln Deal Value	0,1035	-0,0137	-0,0334	0,4421	-0,0672	-0,2864	1,0000		
Leverage	-0,1169	-0,1919	-0,1395	-0,2231	0,1242	0,0018	-0,1486	1,0000	
Financial Bidder	-0,1823	-0,1801	-0,2358	0,0715	0,2810	-0,0842	-0,2200	0,4290	1,0000

*Table 10 - Correlation matrix*

## Calculation and results

This section examines the influence of ESG performance on shareholder value generation by analyzing acquirer M&A announcement returns. The first part shows the result of the event study while the second one is the multivariate regression analysis with a digression over the effect of various deal characteristics on bidder's returns and ESG score similarity. In addition to the main analysis, additional research is conducted on the same sample to analyze the effect of the affinity of the score of the companies involved in the operation. To this end, the variable ESG relativity is amended.

### 4.1 Event study result

The event study calculation has returned the following result. The following table shows the cumulative average abnormal return for the shareholders of the bidder firms included in the sample for the different event windows considered and for the different market indices and the relative value of significance is shown in brackets. In addition, a graphical representation of CARs over the [-10,10] for both indices is reported below.

Acquirers CAAR	Stoxx 600	Reference Country Index
CAAR (-10,10)	-0,011 (0,430)	-0,017 (0,214)
CAAR (-5,5)	-0,005 (0,634)	-0,012 (0,554)
CAAR (-2,2)	-0,004 (0,704)	-0,007 (0,465)
CAAR (-1,1)	0,000 (0,969)	-0,002 (0,792)

The superscripts \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level respectively

*Figure 8 - Acquirers CAAR over different time windows*

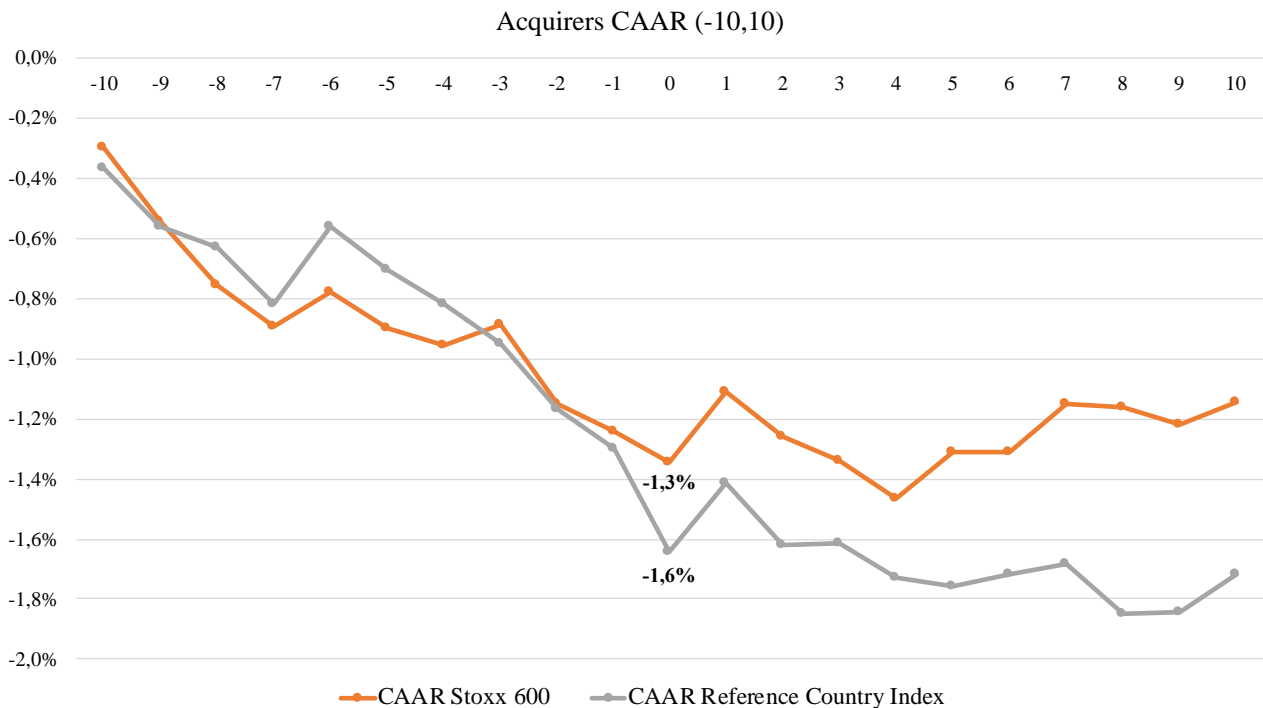


Figure 9 - Acquirers CAAR (-10,10)

The results clearly show that on average the shareholders of the sampled acquiring companies receive a slightly negative return in the first days before the announcement for both considering both the *Stox 600* and the reference country index. Looking at figure 9, on the day of the announcement, the average cumulative abnormal return is negative and about -1.3% and -1.6% respectively meaning that on average, The announcement of an M&A transaction entails a market expectation of no value creation for shareholders. This is confirmed in the days following the event day when the average abnormal returns further decrease. These results are in line with the ones present in the literature where it is confirmed that the shareholders of the acquiring companies receive substantially zero or slightly negative returns at the time of announcement: (Aktas, et al., 2011) reported a negative CAR(-3,3) of -1,16% and (Andrade, et al., 2001) showed a CAR around the event date of -0,7%. Unlike this, (Moeller, et al., 2004) reported a positive and significant bidder CAR of 1,5% which is mostly due to the inclusion of smaller and private target agreements.

## 4.2 Multivariate regression analysis

The cross-sectional regression analysis is carried out using acquirer CARs (-1, 1), CARs (-2,2) CARs (-5,5), and CARs (-10,10) as the dependent variable, and the variables defined in section 3.2.1 as an independent variable as found in the literature review.

The results of four different regression models defined in section 3.2.1 are shown in the following tables. Coefficients and p-values for the variables in the model, as well as the adjusted R<sup>2</sup> of the regression, are also shown. The value of the F-test is also reported for each model. The regression model's ability to fit the data more accurately than a model with no independent variables is determined by the F-test. In general, the results show that none of the four models reported non-significant levels for this value meaning that overall, the models fit the data well.

<i>Regression Statistics</i>	
Multiple R	0,61660808
R Square	0,380205525
Adjusted R Square	0,240751768
Standard Error	0,088451708
Observations	50

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,19197433	0,021330481	2,726391406	0,014016469
Residual	40	0,312948186	0,007823705		
Total	49	0,504922517			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,323357707	0,132871788	-2,433606947	0,019510471	-0,591901608	-0,054813806	-0,591901608	-0,054813806
ESG Relativity	0,021688917	0,030023681	0,722393646	0,474255013	-0,038991207	0,08236904	-0,038991207	0,08236904
Cash deal	-0,003653605	0,032965066	-0,110832636	0,912303321	-0,07027849	0,062971279	-0,07027849	0,062971279
Cross Border	0,062018717	0,028201897	2,199097339	0,033714177	0,005020557	0,119016877	0,005020557	0,119016877
LN Bidder Size	0,000137442	0,012405132	0,011079427	0,991215153	-0,024934266	0,02520915	-0,024934266	0,02520915
Relative Industry	-0,01312237	0,032760127	-0,400559178	0,690876199	-0,079333056	0,053088317	-0,079333056	0,053088317
Friendly	0,009381546	0,058552381	0,160224839	0,873510378	-0,108957231	0,127720323	-0,108957231	0,127720323
Ln Deal Value	0,036731818	0,012772266	2,87590466	0,006428777	0,010918106	0,06254553	0,010918106	0,06254553
Leverage	0,011139536	0,004142425	2,689133809	0,010395708	0,002767382	0,01951169	0,002767382	0,01951169
Financial Bidder	0,042716993	0,04238603	1,007808313	0,31960436	-0,042948368	0,128382354	-0,042948368	0,128382354

Figure 10 - Results of the multivariate regression CAR (-10,10) (Model 1)

Over the event window of (-10,10), the model shows an R-squared value of 0,3802, an adjusted R-square of 0,2407, and an F-value significant at a 5% level. The *ESG Relativity* coefficient is positive but non-significant. *Cross Border* and *LnDealValue* report a positive and significant at 5% and 1% LN respectively. This is in line with the previous literature for which higher bidder CARs are associated

with a cross-border deal. This is also true for the *Leverage* coefficient which is found to be positive and significant at 5%. According to (Jensen, 1986), this may be motivated by the free cash flow theory.

SUMMARY OUTPUT

<i>Regression Statistics</i>								
Multiple R	0,590549892							
R Square	0,348749175							
Adjusted R Square	0,202217739							
Standard Error	0,070023418							
Observations	50							

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,105029551	0,01166995	2,380029741	0,029105562
Residual	40	0,196131164	0,004903279		
Total	49	0,301160715			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,212064076	0,105188888	-2,016031166	0,050547518	-0,424658749	0,000530596	-0,424658749	0,000530596
ESG Relativity	0,027867034	0,023768459	1,172437555	0,247956906	-0,020170814	0,075904882	-0,020170814	0,075904882
Cash deal	0,00890718	0,026097027	0,341310134	0,734656607	-0,04383688	0,061651239	-0,04383688	0,061651239
Crosss Border	0,06345215	0,022326231	2,842044913	0,007022575	0,018329155	0,108575145	0,018329155	0,108575145
LN Bidder Size	-0,003435597	0,009820611	-0,349835397	0,728297559	-0,023283792	0,016412597	-0,023283792	0,016412597
Relative Industry	-5,79734E-05	0,025934786	-0,002235353	0,998227559	-0,05247413	0,052358183	-0,05247413	0,052358183
Friendly	0,013364789	0,046353405	0,288323784	0,774587721	-0,080318938	0,107048516	-0,080318938	0,107048516
Ln Deal Value	0,024753717	0,010111254	2,448135175	0,01884165	0,00431811	0,045189323	0,00431811	0,045189323
Leverage	0,006030032	0,00327938	1,838771807	0,073381274	-0,000597843	0,012657906	-0,000597843	0,012657906
Financial Bidder	0,06576555	0,033555199	1,959921305	0,056997747	-0,002052038	0,133583137	-0,002052038	0,133583137

Figure 11 - Results of the multivariate regression CAR (-5,5) (Model 2)

The second model shows an R-squared value of 0,3487 and an adjusted R-square of 0,2022 with a p-value of F statistic equal to 0,029 and so the null hypothesis of the F-test cannot be rejected at a level of 5%. Again, the *ESG relativity* coefficient is positive but not significant. Also, in this regression two variables, *CrossBorder* and *LN Deal Value*, report a positive coefficient and a significance level of 1% and 5% respectively. Similarly, the *Leverage* variable is positive and significant at 5%. Overall, it is possible to affirm that Model 1 and Model 2 brought to the same conclusion: over these event windows is not it is not feasible to say that there is sufficient statistical evidence to recognize a positive effect of ESG relativity.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,610061347
R Square	0,372174847
Adjusted R Square	0,230914188
Standard Error	0,06040014
Observations	50

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,086505592	0,009611732	2,634667352	0,01699983
Residual	40	0,145927074	0,003648177		
Total	49	0,232432666			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,173867985	0,090732839	-1,916263037	0,062496918	-0,357245892	0,009509922	-0,357245892	0,009509922
ESG Relativity	0,043221658	0,020501973	2,108170625	0,041328808	0,001785624	0,084657691	0,001785624	0,084657691
Cash deal	-0,00898396	0,022510528	-0,399100375	0,691942088	-0,054479433	0,036511513	-0,054479433	0,036511513
Crosss Border	0,056200786	0,019257949	2,918316229	0,005751089	0,017279019	0,095122554	0,017279019	0,095122554
LN Bidder Size	0,001750879	0,00847097	0,206691679	0,837299212	-0,015369589	0,018871347	-0,015369589	0,018871347
Relative Industry	0,020161825	0,022370583	0,901265099	0,372842191	-0,025050809	0,06537446	-0,025050809	0,06537446
Friendly	-0,001002443	0,039983083	-0,025071675	0,980122456	-0,081811268	0,079806382	-0,081811268	0,079806382
Ln Deal Value	0,01616513	0,00872167	1,853444329	0,071204741	-0,001462023	0,033792283	-0,001462023	0,033792283
Leverage	0,005358137	0,002828697	1,894206875	0,065444233	-0,000358873	0,011075147	-0,000358873	0,011075147
Financial Bidder	0,032816552	0,028943727	1,13380532	0,263625936	-0,025680903	0,091314006	-0,025680903	0,091314006

Figure 12 - Results of the multivariate regression CAR (-2,2) (Model 3)

The third model shows interesting results. Looking at the F-test it is possible to affirm that the model is significant enough to consider that most of the individual variables are significant. The value of R-square and adjusted R-square is in line with the previous models and are about 0,3721 and 0,2309 respectively. In particular, the model predicts a positive and significant 5% coefficient for the variable *ESGRelativity* as opposed to what was pointed out in the first two models. According to (Bereskin, et al., 2018), ESG similarity across organizations is an excellent proxy for cultural fit, which is frequently viewed as a critical component for effective post-closing integration. The degree to which post-closing integration goes smoothly has a significant influence on the extent to which synergies are realized and how much value is produced for shareholders. If this is true, then the amount of ESG performance similarity should have a favorable influence on shareholder value creation. Furthermore, (Alexandridis, et al., 2016) conclude that based on cultural “clashes theory”, deals with larger corporate cultural distance reported lower acquirer cumulative abnormal returns. It indicates that the theoretical value captured by the market due to expected synergies is reduced in proportion to the cultural distance between companies. The evidence from Model 3 suggests that the market reacts positively to an acquisition performed towards target companies that exhibit a higher ESG score than the bidder and hence this is consistent with the “cultural synergy theory” which states that differences and complementariness between firms could be a source of value creation in M&As. In this field, (Tarba, et al., 2019) showed evidence that cultural variations may positively affect synergy and

potential realization, and so value generation because enterprises learn and tap into significant resources in culturally varied target organizations, hence increasing their competitive advantage and capabilities. Moreover, this result is congruent with the stakeholder value creation theory as the market recognized an increase in value for acquiring a target with high ESG performance as found also by (Deng, et al., 2013). Additionally, these outcomes are in line with the findings of (Aktas, et al., 2011) who found significant evidence that investors reward buyers that invest in socially responsible operating firms because the buyer can learn from the target's CSR practices.

Having regard to the other variables, the third model returns a positive and significant coefficient for *Cross Border* signaling that acquiring or merging an international company leads to a higher abnormal return (Kang, 1993). Found a positive but non-significant coefficient for the financial bidder dummy variable, meaning that is not possible to statistical affirm the fact that the bidder operates in a highly regulated industry, such as the banking one, which may be a source of positive reaction because bidders will be undertaken exclusively profitable operations and well received from the various regulatory agencies (Kiymaz & Baker, 2008). Surprisingly, the models do not show any significant results for *Friendly* and *Relative Industry* contrary to other similar studies. This could be caused by the size and the characteristic of the selected sample where most of the deals were undertaken in a friendly environment<sup>7</sup>.

Lastly, as for the rest of the models, the fourth one lead to a significant level of F-test and a similar R-square and adjusted R square values. Again, a positive and statically significant coefficient is found for *ESG relativity*, *Cross Border*, and *Leverage* variables, partially confirming the outcome of Model 3. Seems that the level of debt acts as an enhancer of performance because (Jensen, 1986) leverage helps to prevent high free cash flow firms from wasting resources on low return projects. This result is also consistent with the findings of (Ng & Baek, 2007) who found that ROE and ROA are improved after merging with a firm with high leverage.

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<sup>7</sup> Regarding the variable *Friendly*, the sample has shown only 3 hostile transactions.

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,606877798
R Square	0,368300662
Adjusted R Square	0,226168311
Standard Error	0,060856661
Observations	50

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,086371071	0,009596786	2,591251457	0,018628806
Residual	40	0,148141327	0,003703533		
Total	49	0,234512398			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,154832976	0,091418623	-1,693669961	0,098102706	-0,339596905	0,029930953	-0,339596905	0,029930953
ESG Relativity	0,049016989	0,020656933	2,372907423	0,022543654	0,007267771	0,090766208	0,007267771	0,090766208
Cash deal	-0,016627327	0,022680668	-0,733105685	0,467768815	-0,062466668	0,029212014	-0,062466668	0,029212014
Crosss Border	0,050843293	0,019403506	2,620314712	0,012357081	0,011627344	0,090059243	0,011627344	0,090059243
LN Bidder Size	0,001384957	0,008534996	0,162267985	0,871911777	-0,015864913	0,018634826	-0,015864913	0,018634826
Relative Industry	0,012114277	0,022539666	0,537464791	0,593924263	-0,033440087	0,057668641	-0,033440087	0,057668641
Friendly	0,016874649	0,040285287	0,418878711	0,677545597	-0,064544952	0,09829425	-0,064544952	0,09829425
Ln Deal Value	0,01390421	0,008787591	1,582255023	0,12146721	-0,003856174	0,031664594	-0,003856174	0,031664594
Leverage	0,006092397	0,002850077	2,137625466	0,03871098	0,000332177	0,011852617	0,000332177	0,011852617
Financial Bidder	0,034943939	0,029162492	1,198249422	0,237871575	-0,023995656	0,093883534	-0,023995656	0,093883534

Figure 13 - Results of the multivariate regression CAR (-1,1) (Model 4)

#### 4.2.1 ESG score affinity

To better assess the impact of ESG affinity on the CARs, further analysis is proposed by modifying the *ESG Relativity* variable. The new variable assumes the absolute value of the natural logarithm of the ratio of the ESG scores of the target and the bidder instead of only the natural logarithm of the ratio as it has been implemented in the previous analysis. In this way, it is possible to grasp the affinity uniquely because we consider exclusively positive values without considering possible offsets due to the difference in signs. For example, for affine scores the variable will take values close to zero but, if the target shows a higher score, then the variable will assume values above 1. On the other hand, if the bidder has a higher score, the variable will report a value less than 1 but never negative. Of course, for a

Table 11 below gives the correlation matrix for the new version of the variable. As one could imagine, there are no substantial changes as there are no problems of correlation between the variables in line with the previous analysis. Therefore, it is possible to assume that there are no multicollinearity problems between the variables under analysis.

	<i>ABS(ESG Relativity)</i>	<i>Cash deal</i>	<i>Cross Border</i>	<i>LN Bidder</i>	<i>Relative Industry</i>	<i>Friendly</i>	<i>Ln Deal Value</i>	<i>Leverage</i>	<i>Financial Bidder</i>
ABS(ESG Relativity)	1								
Cash deal	0,2185625	1							
Cross Border	0,2323575	0,11328	1						
LN Bidder Size	-0,0219003	0,43362	0,047338	1					
Relative Industry	-0,1240972	0,071238	-0,11645	-0,06201	1				
Friendly	0,1988049	0,242734	-0,00722	-0,10042	-0,14197	1			
Ln Deal Value	-0,276737	-0,01371	-0,03339	0,442091	-0,06717	-0,28638	1		
Leverage	0,0647064	-0,19189	-0,13951	-0,22311	0,124203	0,001806	-0,14856	1	
Financial Bidder	0,0535064	-0,18014	-0,23581	0,071468	0,280976	-0,08422	-0,22003	0,428951	1

Table 11 - New correlation matrix

Below are the figures with the results of the new regression models implementing the new version of the variable.

<i>Regression Statistics</i>	
Multiple R	0,62047524
R Square	0,384989524
Adjusted R Square	0,246612166
Standard Error	0,088109681
Observations	50

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,194389879	0,02159888	2,78217139	0,01246783
Residual	40	0,310532637	0,00776332		
Total	49	0,504922517			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,34961685	0,135340948	-2,5832304	0,01354991	-0,62315111	-0,0760826	-0,62315111	-0,0760826
ABS(ESG Relativity)	0,035739958	0,039063889	0,9149104	0,36572131	-0,043211106	0,11469102	-0,04321111	0,11469102
Cash deal	-0,014468814	0,032966244	-0,4388979	0,66309726	-0,08109608	0,05215845	-0,0810961	0,05215845
Cross Border	0,053747578	0,028717736	1,87158135	0,0685904	-0,00429313	0,11178829	-0,0042931	0,11178829
LN Bidder Size	-0,000481999	0,012278871	-0,0392544	0,96888286	-0,025298524	0,02433453	-0,0252985	0,02433453
Relative Industry	-0,003073739	0,032375595	-0,09494	0,92483651	-0,068507258	0,06235978	-0,0685073	0,06235978
Friendly	0,005596355	0,058458355	0,09573234	0,92421117	-0,112552388	0,1237451	-0,1125524	0,1237451
Ln Deal Value	0,03959739	0,012845927	3,08248608	0,00370887	0,013634804	0,06555998	0,0136348	0,06555998
Leverage	0,010547167	0,004104948	2,56937905	0,01402188	0,002250758	0,01884358	0,00225076	0,01884358
Financial Bidder	0,032926755	0,04182276	0,78729273	0,43575085	-0,051600196	0,11745371	-0,0516002	0,11745371

Figure 14 - New results for CAR (-10,10) (Model 1)

<i>Regression Statistics</i>	
Multiple R	0,579770025
R Square	0,336133282
Adjusted R Square	0,186763271
Standard Error	0,070698404
Observations	50

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,10123014	0,011247793	2,250339803	0,03829135
Residual	40	0,199930575	0,004998264		
Total	49	0,301160715			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,229973715	0,108596342	-2,117693009	0,040465958	-0,44945511	-0,01049232	-0,44945511	-0,01049232
ABS(ESG Relativity)	0,024042302	0,031344508	0,767033967	0,447565177	-0,039307312	0,087391916	-0,039307312	0,087391916
Cash deal	-0,001135724	0,026451814	-0,042935591	0,965966494	-0,054596834	0,052325386	-0,054596834	0,052325386
Cross Border	0,056559363	0,023042849	2,454529966	0,018553909	0,009988028	0,103130699	0,009988028	0,103130699
LN Bidder Size	-0,004506143	0,009852454	-0,457362493	0,649885046	-0,024418696	0,01540641	-0,024418696	0,01540641
Relative Industry	0,00975613	0,025977882	0,375555231	0,709231879	-0,042747129	0,062259388	-0,042747129	0,062259388
Friendly	0,010707956	0,046906451	0,228283222	0,820589088	-0,084093518	0,10550943	-0,084093518	0,10550943
Ln Deal Value	0,027226977	0,010307454	2,641484121	0,011720206	0,006394835	0,048059119	0,006394835	0,048059119
Leverage	0,005412853	0,003293773	1,643359496	0,108147403	-0,00124411	0,012069815	-0,00124411	0,012069815
Financial Bidder	0,055851471	0,033558201	1,664316614	0,103864905	-0,011972183	0,123675125	-0,011972183	0,123675125

Figure 15 - New results for CAR (-5,5) (Model 2)

The results show that the statistically significant models are the first and the second respectively for an event window [-10,10] and [-5,5]. For both the F-statistic is significant at 5%. Similarly, the R-square coefficient stands at about 38% and 33% respectively. The most relevant result is that reported for the coefficient of the variable *ABS(ESG Relativity)* which is positive but for all regression models does not show significance. This result highlights how in the sample under analysis, it is not possible to say that there is a statistically significant effect of ESG relative scores that can somehow explain the occurrence of abnormal returns. There is therefore no link between the affinity of the ESG scores of the target and the bidder in contrast to what was highlighted in the previous analysis. As for the other variables of the analysis, in the first model, both *LN Deal Value* and *Leverage* have positive coefficients and are statistically significant at 1% and 5% respectively. In the second model instead, *Cross Border* and *LN Deal Value* have expressed positive coefficients and significant both to 5%. For what concerns the other variable no significant coefficients have been reported. Overall, these results are consistent with the previous Models 1 and 2.

Considering now the models 3 and 4, these do not report levels of significance such as to be considered sufficient to satisfy the F-test at a level of significance of 5%. For model 3 a positive but not significant coefficient is reported for the variable *ABS(ESG Relativity)* in line with the results of the first two models. Diversely, model 4 shows a negative but still not significant coefficient. Despite this, the *Cross Border* variable is found for both positive and significant at 5% even if we find no

overall significance by performing the F-test. This can happen because the t-test is performed for each variable individually and it may lead to a different conclusion from the overall test (Frost, 2019).

<i>Regression Statistics</i>	
Multiple R	0,5503067
R Square	0,30283747
Adjusted R Square	0,1459759
Standard Error	0,06364812
Observations	50

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,07038932	0,00782104	1,9306033	0,075079716
Residual	40	0,162043347	0,00405108		
Total	49	0,232432666			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,1778353	0,097766753	-1,8189752	0,07640719	-0,37542928	0,01975868	-0,3754293	0,019758677
ABS(ESG Relativity)	0,00438057	0,028218729	0,15523616	0,87741587	-0,052651612	0,06141275	-0,0526516	0,061412746
Cash deal	-0,0187648	0,023813951	-0,7879744	0,43535658	-0,066894574	0,02936501	-0,0668946	0,029365006
Cross Border	0,05112733	0,020744939	2,46456888	0,01811024	0,009200246	0,09305442	0,00920025	0,093054418
LN Bidder Size	-0,0003227	0,008869935	-0,0363777	0,97116216	-0,018249474	0,01760414	-0,0182495	0,017604139
Relative Industry	0,03072515	0,023387281	1,31375481	0,19641411	-0,016542305	0,07799261	-0,0165423	0,077992612
Friendly	-0,0018041	0,042228783	-0,0427216	0,96613599	-0,087151637	0,08354347	-0,0871516	0,083543473
Ln Deal Value	0,01818323	0,009279561	1,9594921	0,05704971	-0,000571466	0,03693792	-0,0005715	0,036937917
Leverage	0,00461739	0,002965307	1,55713657	0,12731576	-0,001375721	0,0106105	-0,0013757	0,010610496
Financial Bidder	0,0214484	0,030211665	0,70993761	0,4818613	-0,039611656	0,08250845	-0,0396117	0,08250845

Figure 16 - New results for CAR (-2,2) (Model 3)

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0,528942147
R Square	0,279779795
Adjusted R Square	0,117730249
Standard Error	0,064980876
Observations	50

<i>ANOVA</i>					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	9	0,065611831	0,0072902	1,726507738	0,114678072
Residual	40	0,168900567	0,00422251		
Total	49	0,234512398			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-0,152624364	0,099813927	-1,5290889	0,134112833	-0,354355836	0,049107108	-0,354355836	0,049107108
ABS(ESG Relativity)	-0,004303176	0,028809612	-0,149366	0,882015418	-0,062529573	0,053923221	-0,062529573	0,053923221
Cash deal	-0,026086844	0,0243126	-1,0729763	0,289712499	-0,075224442	0,023050753	-0,075224442	0,023050753
Cross Border	0,046672056	0,021179325	2,20366112	0,033367095	0,003867043	0,089477069	0,003867043	0,089477069
LN Bidder Size	-0,001083007	0,009055666	-0,1195945	0,905403062	-0,01938519	0,017219175	-0,01938519	0,017219175
Relative Industry	0,02278164	0,023876996	0,95412503	0,345751097	-0,02547557	0,071038849	-0,02547557	0,071038849
Friendly	0,016900579	0,043113027	0,39200632	0,697134428	-0,0702341	0,104035258	-0,0702341	0,104035258
Ln Deal Value	0,015680755	0,009473869	1,65515859	0,105718799	-0,003466648	0,034828158	-0,003466648	0,034828158
Leverage	0,005313315	0,003027398	1,75507636	0,086903406	-0,000805285	0,011431915	-0,000805285	0,011431915
Financial Bidder	0,023180783	0,030844278	0,75154241	0,456725612	-0,039157829	0,085519396	-0,039157829	0,085519396

Figure 17 - New result for CAR (-1,1) (Model 4)

#### 4.2.2 Correction for sample's outliers

In this section, we propose a new version of the analysis carried out previously without considering the outliers in the sample of transactions. Looking at the summary statistics of the ESG scores, we see that they report a variation from the mean that is high. As was highlighted in Table 7, a standard deviation of about 19% is reported for both target and bidder companies. This consideration, coupled with the fact that logarithmic versions of ESG relativity variables were used, could lead to biased conclusions due to the presence of extreme values. To this end, all transactions reporting an  $ABS(ESGRelativity)$  value greater than 1 were eliminated, which led to the reduction of the sample down to 45 transactions. The summary of the results obtained for the four models is given below.

Variable	Model			
	(1)	(2)	(3)	(4)
Intercept	-0,3331 (0,02787)	-0,2143 (0,07853)	-0,1530 (0,15448)	-0,1215 (0,25291)
ABS(ESG Relativity)	0,1023 (0,13605)	0,0705 (0,20513)	0,0438 (0,37261)	0,0438 (0,37056)
Cash deal	-0,0137 (0,69076)	-0,0020 (0,94237)	-0,0182 (0,46796)	-0,0239 (0,33760)
Cross Border	0,0487 (0,13651)	0,0526 (0,05087)	0,0511 (0,03388)	0,0481 (0,04382)
LN Bidder Size	-0,0025 (0,84914)	-0,0058 (0,58937)	-0,0035 (0,71392)	-0,0055 (0,56114)
Relative Industry	0,0023 (0,94972)	0,0098 (0,73832)	0,0233 (0,37146)	0,0130 (0,61410)
Friendly	-0,0057 (0,92591)	0,0021 (0,96681)	-0,0094 (0,83306)	0,0079 (0,85831)
Ln Deal Value	0,0392 (0,00586)	0,0269 (0,01844)	0,0192 (0,05474)	0,0173 (0,08012)
Leverage	0,0095 (0,03251)	0,0048 (0,17604)	0,0038 (0,23214)	0,0041 (0,18951)
Financial Bidder	0,0319 (0,49773)	0,0523 (0,17716)	0,0289 (0,39754)	0,0374 (0,27297)
<i>N</i>	45	45	45	45
<i>R-square</i>	0,395	0,326	0,305	0,310
<i>Adj R-square</i>	0,240	0,152	0,127	0,133
<i>F</i>	2,542	1,878	1,709	1,748
<i>Significance F</i>	(0,02316)	(0,08848)	(0,12382)	(0,11474)

Table 12 - Regression results after sample correction

As for the previous analysis, Model 1 reports the best significance levels compared to the other models which are still found to be at least 5 percent not significant. In addition, with the proposed sample adjustment, now the *ESGRelativity* variable reports a positive coefficient and improved but is still not statistically significant. For the first model, the only variables that were found to be significant are *LN DealValue* and *Leverage*. For what concern the other models, there is no overall improvement in model fitting. This could be due to the reduction in the number of companies included in the sample which may have increased somehow the significance of the *ABS(ESGRelativity)* variable, by eliminating outliers, but not so much as to overcome the negative effect that occurs in linear regression models due to the reduction in observations.

# Conclusion

## 5.1 Evidence

This analysis explored the link between social performance and shareholder value generation in merger and acquisition transactions in the context of continental European countries and the United Kingdom. Corporate sustainability has received increased attention in recent years, with an emphasis on Environmental, Social, and Governance (ESG) aspects. Despite increased interest among practitioners and scholars, the influence of social performance on financial success remains controversial, empirical data is limited, and the results show mixed evidence. This research adds to the current literature to understand the implications of ESG in corporate takeovers and mergers focusing on European companies.

In the analysis, an event study is conducted for a sample of 50 companies during the period 2011-2021. It is found that overall, over an event window of  $[-10,10]$  days bidder's shareholders earn a negative cumulative abnormal return of  $-1,1\%$  considering the Stoxx 600 index and of  $-1,7\%$  considering the country's benchmark market index. By decreasing the event window, the trend has been confirmed and on average the shareholders of the purchasing company do not show positive returns. However, by applying a cross-sectional test none of the results proved to be statistically significant.

To test the main hypothesis of whether the market recognizes in the short term the benefits of acquiring or merging a target with a higher ESG score than the buyer, a multivariate regression on multiple time windows has been implemented. To increase the validity of the model, I have also considered various control and explanatory variables. The regression results show that the market recognizes a positive effect for the shareholders of the acquiring companies when the M&A transaction is conducted against a target company that has a higher ESG score over an event window of  $[-2,2]$  and  $[-1,1]$ . Analyzing the positive coefficient for the variable ESG relativity, which allows for discernment of the relativity of the score of the target and the bidder, it is possible to conclude that for buyers who announce a transaction against targets with a higher relative score, the market reacts positively. However, this tends to fade if we consider larger event windows such as  $[-10,10]$  and  $[-5,5]$  where the coefficient remains positive but not statistically significant. This can be traced back to the fact that M&A transactions tend to be complex corporate events and hence, investors required more time to fully process the new information. This evidence embraces the theory of stakeholder value creation at least as far as the very short term is concerned, as the European market

seems to reward buyers who invest in environmental, social, and governmental aware companies. Thereafter for the other variables, the results were confirmed to be in line with those found in the literature although variables such as *Friendly* and *Relative Industry* are found to be statistically insignificant in each model analyzed while others such as *Cross Border* find similar value and significance for all models.

To learn more about the analysis, I also wanted to consider the effect of affinity of ESG scores on abnormal returns in the same time windows. The results were obtained considering the absolute value of the *ESGRelativity* variable for which values near 0 correspond to higher affinity. Although a positive coefficient is recorded for all the models, no significant values were reported such that conclusions could be drawn. In addition, adjusting the sample for the *ABS(ESGRelativity)* outliers does not improve the previous results also due to the reduction of the sample.

## 5.2 Limitation

This thesis investigates the connection between ESG performance and the return of the buyer's shareholders. While the data may suggest a relationship between these two factors, there are several constraints to consider.

First, the choice of the ESG data provider could influence the results obtained, and therefore it is considered that these results are valid within the scope of the research carried out in the Refinitiv ESG scores database. Multiple ESG databases used different selection methods for which firms to include in their sample and how to standardize their CSR scores to make them comparable with group peers. So, the findings of this investigation are not directly comparable to those of other databases.

Second, because financial and accounting data for public organizations is easily available, this study is based on a very modest sample of European public corporations. The ideal approach would have been to examine a randomly chosen sample of the firm to estimate the cumulative abnormal return but, for this research, the data collection only included target and bidder companies that got an ESG score the year of the deal's announcement. Furthermore, ESG scores are connected to the level of ESG disclosure (Refinitiv, 2022) which suggests that ESG disclosure may be related to the level of voluntary financial transparency. When disclosure is optional, it is logical to predict that organizations with strong ESG performance will be more motivated to reveal their actions than those with poor performance (Hummel & Schlick, 2016) leading to a potential bias sample.

### 5.3 Future Research

Considering the limitation described above, the basis for future study is outlined in the constraints section. For example, this study investigates the association between ESG performance and M&A announcement returns using the Refinitiv database, and hence, future research could provide a meta-analysis of the relationship between ESG, and M&A performance based on the various databases, which could provide a more coherent view of this relationship or indicate that a specific database is better to measure ESG performance and its effect on M&A performance. Going on, while this study focuses on the total ESG score, future research might focus separately on single ESG pillars, which were described in section 3.1.2. This might indicate whether investors should base their investment decisions on the environmental, social, governance, or a mix of these pillars rather than the total ESG score. Finally, this study investigates the connection between ESG performance and acquirer returns. However, does not examine the possible impact of ESG performance on target returns and combined deal returns. Further study might give proof that ESG performance is significantly more valuable when looking at the merged business rather than just the acquirer (Mees, 2020).

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## Appendix

*Appendix 1 - List of reference countries' market indexes*

<b>Reference Country</b>	<b>Market Index</b>	<b>N° of deals</b>
Luxembourg	LuxX Price Index	1
Spain	IBEX 35	6
France	CAC 40	12
Sweden	OMSX30	4
Finland	OMSX Helsinki 25	3
Italy	FTSE MIB	3
Germany	DAX	6
United Kingdom	FTSE 100	10
Poland	WIG 30	2
Ireland	FTSE Ireland Index	2
Greece	Athex Composite Share Price Index	1
		50

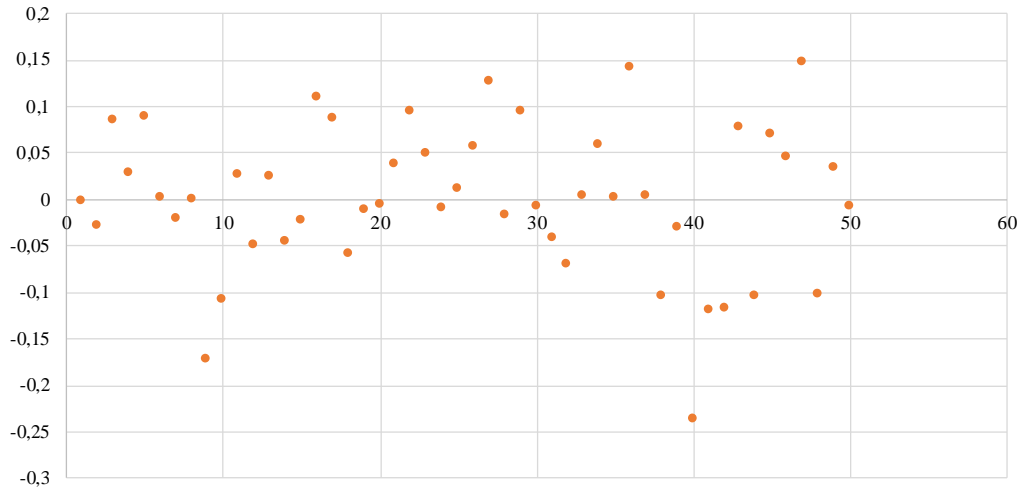
*Appendix 2 - VIF value for multicollinearity*

<b>Variable Name</b>	<b>VIF</b>	<b>1/VIF</b>
LN Bidder Size	2,12	0,47
Financial Bidder	1,84	0,54
Cash Deal	1,73	0,58
Ln Deal Value	1,68	0,60
Leverage	1,36	0,73
Relative Industry	1,25	0,80
Friendly	1,24	0,81
ESG Relativity	1,23	0,81
Cross Border	1,11	0,90
<b>Mean</b>	1,51	

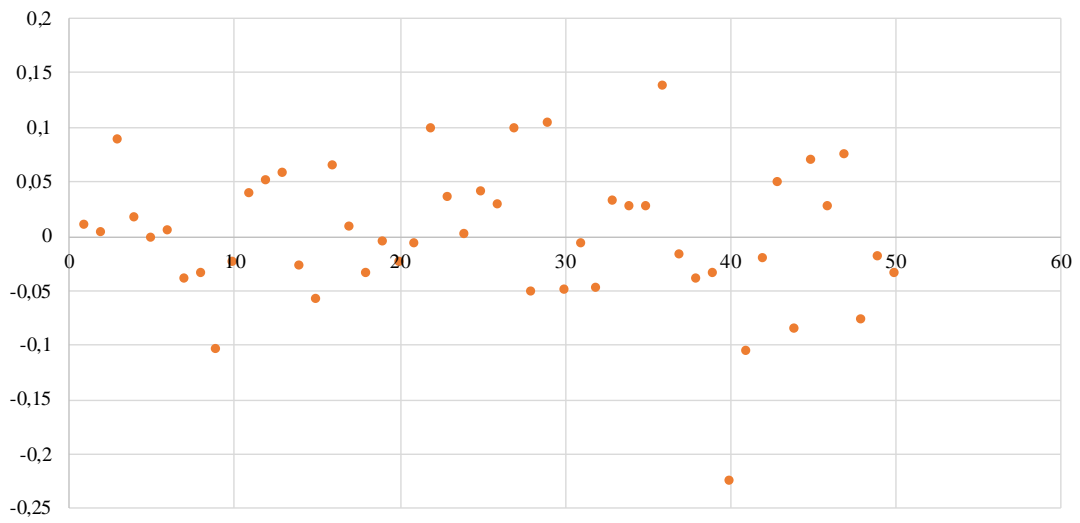
Note: Values < 10 indicate multicollinearity

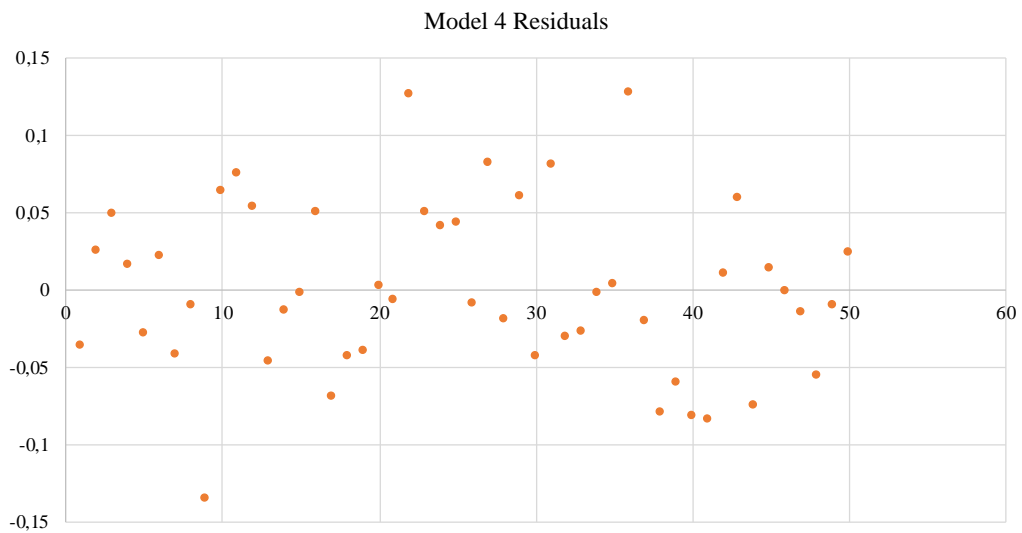
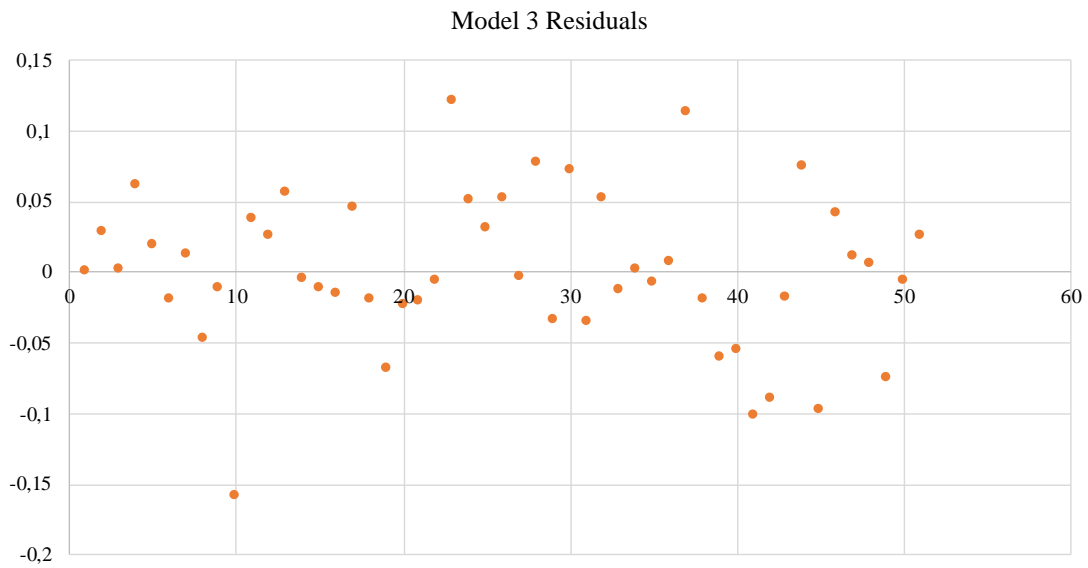
*Appendix 3 - Residual plot regression Model*

Model 1 Residuals



Model 2 Residuals





*Appendix 4 - White's test for heteroskedasticity*

<b>Model</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Statistic Chi square	41,91	37,15	46,50	45,78
df	42	42	42	42
P-value	0,4747	0,6833	0,2924	0,3181

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

*Appendix 5 - Breusch-Pagan's test for heteroskedasticity*

<b>Model</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>
Statistic Chi square	1,25	2,42	0,10	0,52
df	1	1	1	1
P-value	0,2639	0,1185	0,7482	0,4697

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