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Does ESG affect shareholder value creation? Evidence from the M&A market

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Abstract

We examine the relationship between social performance and shareholder value creation in corporate takeovers using a sample of 3,142 M&A deals in the US. We construct two variables that summarise the social performance of a firm (*ESG score*) and the social performance similarity between the acquirer and the target (*ESG similarity*). The empirical results reveal several insights. First, we provide evidence that socially committed acquirers experience positive and significant abnormal returns compared to insignificant abnormal returns for acquirers with poor social performance, though a multivariate regression analysis does not corroborate these finding. Second, investors expect the realisation of greater synergies between firms with a higher degree of ESG similarity and react positively when these deals are announced. Finally, we show that acquirers with an ESG profile similar to the target are more likely to pay lower bid premiums to complete the takeover. Overall, the results support the stakeholder theory suggesting that social performance is a significant determinant of M&A performance.

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List of Abbreviations

CAAR – Cumulative Average Abnormal Return

CAR – Cumulative Abnormal Return

CSR – Corporate Social Responsibility

ESG – Environment, Social and Governance

KLD – MSCI ESG KLD STATS database

M&A – Mergers and Acquisitions

OLS – Ordinary Least Squares

SDC – Thomson Reuters Securities Data Corporation database

1. Introduction

Corporate takeovers are one of the most significant events in the life of a firm and represent the largest and the most readily observable form of corporate investment (Golubov, Petmezas and Travlos, 2013). Not surprisingly, it is a major area of study in corporate finance, and much of the current literature has attempted to identify the variables that influence the performance of mergers and acquisitions (M&A). This paper investigates the impact of these variables on a large sample of M&A deals, with a focus on the relationship between a firm's social commitment and its M&A performance, which in turn affect value creation for its shareholders.

Whether a firm should engage in socially responsible activities that deviate from the profit maximisation is a question deeply rooted in economic theory. According to the traditional *shareholder theory*, social welfare is maximised when each firm maximises its profit. In sharp contrast, *stakeholder theory* argues that managers should take account of the interests of all stakeholders in a firm, including not only financial claimants but all those who are affected by the decisions made by the firm. This long-lasting debate has been getting renewed interest in the last years as the attention to Environmental, Social and Governance (ESG) factors in investment and M&A decisions has continuously increased. ESG criteria are a set of standards aiming at assessing firms' performance with regard to these three broad categories. By looking at these measures is possible to gauge a company's social commitment and assess its Corporate Social Responsibility (CSR) behaviour towards these dimensions. Corporate social responsibility can be defined as the set of a company's practices and voluntary initiatives that helps it to be socially accountable and define its relationship with its stakeholders and the surrounding environment. Despite being not compulsory, many firms have raised their investment in ESG either voluntarily or as a result of pressure from activist investors, and detail their social activities in their annual reports. Given the growing interest around this topic, the recent literature has tried to find a relationship between social performance and financial performance, at the same time practitioners are increasingly incorporating non-financial factors in their investment decisions. However, only a limited number of studies have analysed the impact of sustainability on M&A activity, and empirical evidence is still scarce.

In the context of M&A, several surveys show growing importance given to *ESG due diligence*, to the point that is now considered a core part of the deal process.[1] Increasingly, deal makers are integrating ESG factors into their due diligence process in order to uncover hidden risks and adjust the valuation and the deal's terms accordingly. However, the extent to which ESG factors are considered is primarily affected by the sector concerned and the deal size.[2] In certain sectors, such as utility, energy and mining, sound performance on ESG factors has been part of proper business management for years, while in

[1] KPMG – Integrating environmental, social and governance (ESG) due diligence into deals
[2] The integration of environmental, social and governance issues in mergers and acquisitions – Transactions trade buyers survey results (PwC)

other sectors these factors are seen as less material to the business. Large firms usually adopt a more systematic approach to ESG due diligence and allocate more resources to this aspect. By contrast, small firms still have a weak and inconsistent approach, especially in emerging and developing markets. ESG performance represents a significant lever in price negotiation when is critical to have a comprehensive view of all relevant risks and opportunities; it can also have a significant impact on valuation in terms of cost-saving associated to energy efficiency, reputation, employee engagement or customer loyalty. Overall, there is consensus that the focus on ESG in due diligence process has increase over the past years and the trend is set to continue in the future as the issues related to it become more material in the context of corporate transactions. Moreover, as ESG information becomes more detailed, standardised, and widely available ESG due diligence is likely to expand beyond risks and potential liabilities and begin to encompass also positive aspects such as business sustainability, brand value and employee or customer engagement.

This paper joins the ongoing debate about the merits of ESG, with the purpose of better investigate the relationship between social performance and shareholder value creation in corporate takeovers. Its purpose is twofold. First, it is proposed to assess whether acquirers that are more socially responsible engage in M&A transactions that generate more value for their shareholders. Second, it examines the effect of ESG similarity between acquirer and target on shareholder value creation, to determine whether a higher degree of similarity leads to more successful and synergistic deals. To answer these questions, an empirical analysis is conducted following the contributions of previous studies from Deng, Kang and Low (2013) and Bereskin et al. (2018), which are among the firsts who analysed the impact of corporate sustainability on mergers. The present paper differentiates from them by focusing exclusively on short term returns, at the same time it expands the scope of research by analysing not only on mergers but also acquisitions and using a more recent sample of deals.

More specifically, a sample of 3,142 M&A deals between 1998 and 2017 have been analysed using an event study approach and the estimation of multivariate regression models. First, the selected sample is divided into two subsamples of low and high ESG acquirers, the classification is based on the full sample mean of the *ESG Score*, a variable described later in the text. Then, an event study is applied to test the difference in the acquirers Cumulative Average Abnormal Returns (CAARs) between the two subsamples. The results show that high ESG acquirers realise on average positive and significant announcement returns vis-à-vis non-significant CAAR for low ESG acquirers, with the difference between the two subsamples being positive and significant. Second, the impact of a firm's social performance on M&A value creation is further investigated using multivariate regression models. In this analysis, the acquirers' Cumulative Abnormal Returns (CARs) are regressed on their ESG Score and *ESG Similarity*, respectively, also including some deal-specific characteristics. The results show that as regards to M&A value creation, the degree of ESG similarity between the acquirer and the target

is a potential driver of performance. Finally, the last regression model analyses the impact of social similarity on bidding premiums, showing a negative relationship between them.

The advantage of using CARs instead of others firm's performance measures (e.g. ROE, stock price, firm value, etc.), is that M&A events are largely unanticipated thus using announcement returns allow to mitigate the *reverse causality* problem that affects many studies that try to link ESG with firm's financial performance (Waddock and Graves, 1997). For instance, a company may decide to make more ESG investments as a result of a sound financial performance because it can afford non-essential spending, so firms with high ESG score show a higher value but is the latter variable that affects the former.

This dissertation is organised as follow. Section 2 offers an overview of previous studies related to M&A value creation. Section 3 explains the methodology employed and the regression models. Section 4 describes the data collection and shows the summary statistics of the sample, along with the definition of variables included in the models. In Section 5 are reported and discussed the empirical results. Finally, Section 6 summarises the main results obtained and suggests potential future research.

2. Literature Review

The purpose of this section is to provide an overview of the empirical evidence regarding the shareholder value creation in M&As. The first paragraphs present a broad literature review of the motives leading to M&A, the merger waves and the factors that affect corporate takeovers' performance. The last part focuses more specifically on the academic findings related to this study and the impact of ESG on value creation.

2.1.Motives for M&As

Among the existing studies, the most common cited primary motivation for M&As, is the potential synergy between the acquirer and the target (Ferreira et al., 2014). Synergies can be defined as the additional value created by the combination of two businesses, thus are achieved when the value of the combined entity resulting from the M&A transaction is higher than the sum of the two stand-alone firms (Desai and Kim, 1988). Synergies can be either operating or financial. *Operating synergies* can be achieved through a reduction in average total costs due to the decline in average fixed costs as production volume increases (economies of scale), or because it is cheaper to produce two or more products in a single firm than in separate firms (economies of scope). Other drivers of operational synergies are the acquisition of complementary technical assets and skills, rationalisation of overhead expenses, and revenue enhancements due to optimisation of the distribution network (e.g. cross-selling). *Financial synergies* refer to the reduction in the acquirer's cost of capital due to a merger or acquisition. M&As that result in firms whose individual business unit cash flows are uncorrelated lead, on average, to a reduction of earnings volatility and a lower cost of capital (Hann, 2013). Furthermore, target firms

usually become less financially constrained when they are acquired, especially when the target firm is relatively small. (Erel et al., 2015).

Diversification, besides creating financial synergies, allows a firm to shift its core business towards new growing markets and may accelerate overall growth. However, share prices of conglomerates (firms that operate in many unrelated businesses) often trade at a discount compared to shares of firms focused on a single sector (Berger & Ofek, 1995).

A common M&A reason is also managerial overconfidence (also known as the *hubris* hypothesis), First introduced by Roll (1986), this hypothesis suggests that some CEOs engage in M&A deals due to excessive optimism regarding their ability to create value. Empirical evidence suggests that because of the overestimation of synergies, these managers tend to overpay for targets and are likely to destroy value for their shareholders (Malmendier and Tate, 2008). CEOs may involve in acquisition to augment their compensation (often linked to firm size), strengthen their prestige, and build their spheres of influence (Masulis, Wang, & Xie, 2007). In this case, managers undertake acquisitions against the interests of firm's shareholders, agency problems may be mitigated by the target's board of directors by using fairness opinions. Not surprisingly, evidence suggests that acquisitions driven by these motives destroy shareholder value.

Although rarely the main reason behind takeover transactions, *tax considerations* play an important role in corporate decision making. Targets with tax credits are attractive because acquirers firms may use them to offset future profits generated by the combined entity. Hayn (1989) shows that merger gains are positively associated with the tax attributes of the target, such as loss carry-forwards, tax credits, and the possibility of higher depreciation charges from asset value step-ups. Furthermore, if the target is based in a low-tax jurisdiction, a reincorporation may allow the acquirer to change its tax domicile and consequently be subject to a lower tax rate. Finally, other motives for M&A can be found in stock market misevaluation, the willingness to increase market power, and the influence from investment banks that earn high fees from advising on M&A deals (Golubov et al. 2011). The next section will focus on how industry shocks and market valuations have led takeover activity to form merger waves over the years.

2.2.Mergers & Acquisitions waves

Before to start our analysis is important to provide an historical dimension of the phenomenon, therefore this paragraph focuses on how industry shocks and market valuations have led takeover activity to form merger waves over the years. It is a well-known fact that mergers and acquisitions tend to cluster in waves. This means that the number and the total value of takeover deals show a cyclical pattern when plotted over time. Nevertheless, it is worth mention that Netter et al. (2011) have shown that in samples that include small deals and private acquirers, the M&A activity in is smoother and less wavelike than patterns observed with only public acquirers and large deals.

There are two competing explanations for M&A clustering: the *neoclassical hypothesis* and the *behavioural hypothesis*. The first, widely supported by Mitchell and Mulherin (1996), is that takeover waves occurs as a result of industry shocks; the second, proposes that takeover waves are driven by misevaluation or irrational managerial decisions, as shown by Rhodes-Kropf and Viswanathan (2004), Shleifer and Vishny (2003). When takeovers are a response to economic, technological, financial, regulatory, and political shocks and managers act in shareholders' interest, M&A activity is expected to lead to profit optimisation and shareholder value creation. By contrast, transactions driven by managerial hubris and herding behaviour are likely to be value-destroying. In their study, Martynova and Renneboog (2008) argue that takeovers occurring early in the wave are triggered by industry shocks and increase shareholders wealth, these deals are usually followed by unprofitable takeovers as result of the agency problems mentioned early. It follows that the majority of value-destroying acquisitions occur in the second half of the takeover wave. The neoclassical hypothesis is deemed to be prevailing by Harford (2005) provided that when the shock happens the market has sufficient overall capital liquidity. Differently, Gugler et al. (2012) pointed out that if real changes in economy diver waves, as predicted by the neoclassical theory, both listed and unlisted firms should experience waves positively correlated with external shocks. However, the evidence that unlisted firms fail to increase M&A activity following industry shocks, does not offer support to the neoclassical theory. In conclusion, no single theory is able to explain entirely takeover activity and M&A waves, but both contribute to their understanding.

Since the late 1890s there have been a total of seven identifiable multiyear waves in the US. Although there is not a unanimous consensus regarding the exact starting and ending years of the waves, most of the academics agree with the classification reported below:

The First Wave (1897 - 1904): This first wave was driven by radical changes in technology, economic expansion, innovation in industrial processes and a lax enforcement of the Sherman Anti-Trust Act. These years are largely characterised horizontal consolidation between competitors, resulting in increased concentration especially in metal, transportation and mining industries.

The Second Wave (1916 - 1929): Most of the activity during this period was a result of the post-war economic boom. Mergers also tended to be horizontal between small companies, in an effort to compete with the monopolies created during the previous wave. This resulted in a move towards oligopolies with industries no longer dominated by one firm but by a few corporations.

The Third Wave (1965 - 1969): In this period a high number of diversifying takeovers led to the development of large conglomerates intended to reduce earnings volatility by investing in unrelated sectors. Firms learned to boost earnings per share (EPS) by buying firms with lower P/E ratios but high earnings growth to increase the EPS of the combined company.

The Fourth Wave (1981 - 1989): The beginning of this wave coincided with the recovery of the stock market, changes in anti-trust policy and the deregulation of the financial services sector. The 1980s was characterised by the breakup of many major conglomerates by so-called corporate raiders using hostile takeovers and leveraged buyouts (LBOs). As a consequence, many antitakeover measures were first adopted in these years to prevent hostile takeover attempts.

The Fifth Wave (1993 - 1999): Spurred by a sustained economic growth, technological innovation, deregulation and privatisation, this wave was characterised by friendly and stock-financed mergers. A significant portion of M&As was cross-border transactions, viewed as a way to cope with the tough international competition created by economic globalisation.

The Sixth Wave (2003 - 2008): The sixth wave was characterised by increasing globalisation and the creation of strong national firms operating globally. US financial markets were characterised by a proliferation of complex financial securities collateralised by pools of debt, that eventually contributed to the financial crisis in 2007.

The Seventh Wave (2012 - 2019): the last years have witnessed the highest volume of transactions ever recorded, mostly driven by the high level of liquidity and low interest rates environment due to expansive monetary policies. Consequently, some academics and practitioners argue that there are grounds to acknowledge a seventh wave, which has now been interrupted by the current circumstances.

Historically, merger waves occurred in periods of sustained high economic growth, declining interest rates, and a rising stock market. Nonetheless, they have differed in terms of industry focus, technology development and type of transaction (horizontal, vertical, conglomerate). Since, stock markets seem to reward firms pursuing deals early in the wave while punishes those acting late in the cycle, it is important to anticipate merger waves.

2.3. Value Creation in M&A Deals

A relevant question regarding M&A is whether it creates value for the shareholders of the firms involved. The existing literature has extensively examined this aspect, focusing mostly on US and UK takeover markets which are notoriously more active. Measuring the value created or destroyed by an M&A deal is not straightforward since isolate the effect of the transaction may be challenging, a common way is to analyse the market reaction in the short event window surrounding the announcement of the deal. Under the assumption of market efficiency, the new information brought by an M&A announcement is immediatedly reflected in stock prices, it follows that value value-creative deals are followed by positive returns, and vice versa. Therefore, many researchers use the cumulative abnormal returns (CARs) to bidder and target shareholders around the announcement date as a synthetic indicator of M&A success. There is a consensus that target shareholders enjoy positive and significant abnormal returns (20% - 40% on average) at the announcement, mainly driven by the acquisition premium paid (Dodd and Ruback, 1977; Bauguess et al., 2009; Franks et al., 1991). By contrast, conclusions regarding

bidders abnormal returns are not unanimous, with many inconsistencies and contradictory results among existing studies. Most of the times, empirical evidence shows abnormal returns close to zero, either slightly positive (Moeller et al., 2004; Fuller et al., 2002), or slightly negative (Betton, Eckbo and Thorburn, 2008; Officer, 2003; Hackbarth and Morellec, 2008). The lack of common findings regarding the extent of acquirer returns is due to the fact that these are greatly affected by deal characteristics (e.g. listing status of the target, method of payment). Finally, with acquirer returns being close to zero (either positive or negative) and those of the target being substantially positive, the combined entity often experiences a positive statistically significant abnormal return around the announcement date (Mulherin and Boone, 2000; Andrade et al., 2001).

2.4. Determinants of bidder's announcement returns

As already mentioned, acquiring-firm abnormal returns are mostly situational, and many studies have sought to analyse the relationship between them and deal characteristics. What follows is a discussion of some relevant factors which have been found to have an impact on the acquirer CARs.

The listing status of the target

Target listing status is considered one of the most impactful characteristics. On average, returns seem to be positive when the targets are privately owned and zero-to-negative when the targets are publicly traded firms.

Fuller et al. (2002), study the abnormal returns of US publicly traded firms that completed bids for five or more targets in any three-year window from 1990 to 2000. By doing so, they control for the acquirer characteristics, analysing a sample of announcements where the same bidders try to acquire targets with different listing status (i.e. either private or public). Their results show that CAR is significantly negative for public targets (-1.00%) and significantly positive for private targets (2.08%). Similar results are provided by Betton, Eckbo and Thornburn (2008), using a sample consisting of more than 3000 takeover contests in the US market from 1980 to 2005. By analysing the listing status of the target, the bidder size, and the method of payment, they find evidence that average CAR (-1, 1) of acquiring firms are positive for small bidders acquiring private targets and negative for large bidders acquiring listed targets, both results are statistically significant at 1% level. More specifically, the worst-case scenario (average CAR of -2.21%) is given by the combination of large bidder, public target, and all-stock payment. In contrast, a combination of small bidder, private target, and, again, all-stock as payment represents the best-case scenario (average CAR of 6.46%). Therefore, the two key drivers of CAR appear to be the target's listing status and the bidder size. These findings are consistent with the *limited competition hypothesis*: acquirers pursuing non-listed targets are purchasing assets in a relatively illiquid market with limited competition. Thus, the valuation of those assets reflects an illiquidity discount, resulting in a higher return to bidder shareholders. By contrast, if the market for corporate

controls is competitive, acquirers of public firms should only break even, and the acquisition itself will be a zero net present value project.

Besides, Chang (1998) found that bidders offering common stock experience a positive abnormal return when the target firm is privately held (2.64%) vis-à-vis a negative abnormal return when the target firm is publicly traded (-2.64%). The *monitoring hypothesis* can explain this phenomenon: ownership in private targets is usually concentrated as opposed to dispersed ownership in public firms. Therefore, a stock offer tends to create an outside blockholder, i.e. shareholders that own a significant stake in the firm. Since blockholders have more incentives to monitor managerial performance than dispersed ownership, the market recognises the expected benefits and react positively at the announcement.

Method of payment

In general, when the target firm is publicly traded, all-cash bids generate higher returns to the acquiring shareholders compared to deals where acquirer stock is offered as a form of payment. Andrade et al. (2001) analyse a sample of 4,256 completed deals between 1973 and 1998, where both the acquirer and the target are publicly traded US-based firms. They find that the average three-day abnormal return for acquiring firms that use at least some stock to finance their acquisition is negative (-1.5) and statistically significant, while acquirers that abstain from equity financing have average abnormal returns indistinguishable from zero. Consistently, Travlos (1987) provides evidence that stock exchanges generate significantly negative abnormal returns especially when the financial leverage increases (average acquirers CAR (-1, 1) of -4.08%), by contrast, in the case of cash offers, abnormal returns are not significantly different from zero.

The explanation proposed by Myers and Majluf (1984) is based the assumption of *asymmetric information*: managers have superior information regarding the value of the firm they control and, for publicly traded firms, they have an incentive to issue shares when they believe them to be overvalued by the market. Investors aware of the adverse selection problem, treat the announcement of a stock-offer as signals that buyer equity is overvalued and react negatively, causing the firm's share price to decline. Supporting this view, Chemmanur et al. (2009) show that overvalued acquirers are likely to choose stock a form of payment. In the case of a privately held target, the opposite is true: acquirer returns on stock deals are not negative and often exceed cash offers (Chang, 1998), as seen in the previous paragraph, the monitoring hypothesis offers a justification for this. An additional explanation is proposed by Liu and Wu (2014), who provide evidence that the majority of the decline in acquirer shares price is caused mostly by merger arbitrage activity.[3]

[3] In a stock-for-stock acquisition, merger arbitrageurs take a long position in target shares and a short position in acquirer shares, putting downward pressure on acquirer stock price

Size and Relative size

It is acknowledged that the size of the acquirer and the target affects acquisitions returns. Moeller et al. (2004) examine a sample of 12,023 acquisitions by public firms from 1980 to 2001 and provide evidence of a size effect in M&A returns over time. They divide the sample into small and large acquiring firms depending on whether the firm market capitalisation is less or greater than the market capitalisation of the 25th percentile of NYSE firms in the same year. They then estimate the acquirer's abnormal returns over the three-day event window (-1, +1) using a market model as a benchmark. The results show that large firms have an insignificant equally weighted abnormal return of 0.08% while small firms have an equally weighted abnormal return of 2.32%. Therefore, shareholders of small acquiring-firms earn on average 2.24% more than shareholders of larger acquirers. The difference is significant at 1% confidence level and is robust for different forms of financing and listing status of the target. A reason for this may be that bidder size proxy for the extent of agency costs. Managers of large firms may be more inclined to *hubris* and overpayment (Roll, 1986), while interests of managers in small firms are better aligned with those of the shareholders because of the closer monitoring due to higher ownership concentration (Demsetz and Lehn, 1985).

The relative size of the deal also appears to have a significant effect, with bidder returns decreasing with the relative size of the target in public firm acquisitions. Fuller et al. (2002) find that for public targets, the larger the seller relative to the buyer, the more negative the acquirer CAR (-2,+2). By contrast, for private targets, the opposite is true, with a positive relationship between the target's relative size and the acquirers' positive abnormal returns. One proposed explanation is that the larger the size of the target compared to the bidder, the stronger its negotiating power and ability to obtain more favourable contractual conditions, making the deal less value-creating for the acquirer. Furthermore, larger deals are usually riskier for the acquirer and reflect higher post-closing integration costs and difficulties in realising projected synergies. The opposite effect in the case of a private target may be explained by the fact that managers of private firms might be the firm founders who want to sell to cash out and are thus less incentivised to assume a bargaining position.

Domestic / Cross-border

Shareholders wealth seems to be influenced by the cross-border status of the deal, though the effect is not a clear-cut. Moeller and Schlingemann (2005) collect a sample of 4,430 acquisitions between 1985 and 1995 find empirical evidence that US firms who acquire cross-border targets experience significantly lower announcement stock returns of approximately a hundred basis points relative to those that acquire domestic targets. They also argue that when the bidder is from a country with a great shareholder orientation relative to the target, additional value is generated by the improvement in the target corporate governance (positive spillover). Corroborating these findings, John et al. (2010) find that one of the main determinants of acquirer returns in a cross-border acquisition is the legal protection of minority shareholders in the target country. They analyse a large sample of cross-border acquisitions

by US firms and find that for public targets, acquirer returns are significantly positive when targets countries have low shareholder protection and significantly negative when target countries have high shareholder protection. For private targets, investor protection does not seem to affect acquirer returns.

Industry relatedness

The industry relatedness is often considered a determinant of value creation in M&A. Consistently with the concept of *conglomerate discount*[4], deals in which the buyer and the seller are within the same industry generate higher acquirer return around the announcement day. Morck et al. (1990) analyse a sample of 326 US acquisitions between 1975 and 1987 and find that during the 1980s the returns to bidding shareholders are lower when their firm diversifies, deals are classified as unrelated if the target and acquirer primary 4-digit SIC code is different. Their findings are consistent with the view that managers can pursue unrelated diversification even when it hurts shareholders. However, by looking only at the conglomerate merger wave of the late 1960s, the evidence is that acquirer shareholders benefited from diversification acquisitions, which implies that managerial objectives were not the primary diver for diversification (Matsusaka, 1993). In conclusion, according to the existing literature, whether diversification has a positive or negative effect depends mainly on the sample period, and evidence is not consistent over time.

Hostile / Friendly

Hostile takeovers are those attempts to obtain control of the target without the acceptance of its management. Using a sample consisting of 704 complete takeovers over the period 1972-1987, Servaes (1991) show that hostile takeovers reduce bidder gains by more than 7%. This can be justified by higher premia paid to target shareholders, lower success rates associated with hostile deals, or because takeover defences make the target firm less valuable. However, a more recent study of Schwert (2000) finds that whether the deal is hostile or friendly does not have a statistically significant impact on acquirer abnormal returns. Overall, the evidence in the previous literature is limited, and there is not a clear-cut. On the other end, abnormal returns to target shareholders are usually higher in hostile tender offers due to the higher premia and the prospect of an auction process with competing bidder.

This list of variables is not exhaustive, and other determinants have found to be significant in the literature. Among those: takeover competition (Michel and Shaked, 1988), financial advisor reputation (Golubov et al., 2012), and acquisition technique (Ruback and Jensen, 1983).

2.5. ESG measures and M&A performance

Although the existing literature has extensively examined these two areas of study on a stand-alone basis, there is still limited evidence regarding the relationship between the two. Some recent papers have sought to analyse and quantify the impact of ESG on M&A performance and, more in general, to

[4] According to the concept of conglomerate discount, capital markets penalise the equity value of groups that are over-diversified, with shares of the group trading at a discount compared to the theoretical value of the combined activities

shed light on the long-lasting debate between shareholders view and stakeholders view. The majority of these studies are event studies based on M&A announcements, and firm CSR is often proxied by data collected from ESG databases.

Deng, Kang, and Low (2013) are among the first to study the impact of CSR on shareholders returns. Using the KLD STATS database, one of the largest providers of ESG scores, they investigate a sample of 1,556 successful US mergers between 1992 and 2007. They first perform a univariate test by dividing the deals into two subsamples, and find that the average acquirer CAR (-1, +1) is higher and statistically significant for bidders with higher CSR score. However, the difference between the means is not statistically significant for CARs estimated over larger windows, i.e. (-2, +2) and (-5, +5). Besides, in a multivariate test, the CSR measure (proxied by ESG scores) has a positive and significant impact on acquirer CAR, even after controlling for numerous deal-specific characteristics. The empirical results suggest that firms that integrate stakeholders' interests in their activities and thus have higher ESG score engage in M&A activities that ultimately benefit shareholder wealth and corporate value. Besides, they find that high CSR acquirers realise higher stock returns also in the long-term, suggesting that the market does not fully recognise the benefits of CSR immediately. By contrast, Yen and André (2018) did not find a statistically significant association between CSR and acquirer CARs and argue that the effects of CSR performance on shareholder wealth depend primarily on the cost-benefit concerns of investors. However, they focus merely on emerging market countries, and the sample may be not representative of the entire M&A market. Additionally, Arouria, Gomesb, Pukthuanthongc (2019) find that deals conducted by acquirers with strong CSR are associated with lower deal completion uncertainty, as revealed by narrower arbitrage spreads following initial acquisition announcements. The proposed explanation is that when the attempt comes from a socially responsible bidder, target firms' stakeholders are less likely to oppose the acquisition because of the potential increased reputation of the combined entity.

Some scholars analyse not only the CSR performance of the acquirer but also its closeness with the target firm. Bereskin et al. (2018) conduct research on 570 completed US mergers from 1994 to 2004 and find that firms with similar cultures (proxied by CSR) are more likely to merge, experience smoother post-deal integration and realise higher synergies. Specifically, the differences in the mean and median combined CARs of the high-similarity (top 25th percentile) and low-similarity (bottom 25th percentile) groups are 3.5% and 3.1%, respectively, and both of these differences are statistically significant at the 1% level. The CSR similarity variable is constructed matching ESG scores of acquirer and target over several subcategories. Consistently, Alexandridis et al. (2018) observe that the "corporate cultural divergence" – a variable built using data on ESG – between the acquiring and the target firm is associated with lower acquirer announcement and long-run returns.

Other researchers shift the attention from the abnormal returns to the acquisition premium. Target's ESG performance is positively valued by the bidder, and it is thus related to higher bid premiums

(Cremona and Passador, 2019; Gomes and Marsat, 2018), parallelly acquiring firms with high ESG scores pay lower premiums to target firms Krishnamurti et al. (2019). Some explanations are that socially-oriented firms engage better with stakeholders, have greater transparency and disclosure and are therefore less prone to value-destroying acquisition driven by managerial self-interest.

3. Methodology

This section provides an explanation of the two methodologies used to test the research hypotheses: the event study and the multivariate regression analysis.

3.1. Event Study

Event studies are widely used by researchers to analyse the market reaction to firm-specific events, like in the case of M&A announcements. This approach was proposed for the first time by Fama, Fisher, Jensen and Roll (1969) and has become the dominant technique since the 1970s thanks to its general applicability. Over the years it has been enhanced, notably from Brown and Warner (1980, 1985) who highlight some issues and propose relative solutions. More recently, MacKinlay (1997) and Kothari and Warner (2007) offer a detailed and comprehensive outline of this research method.

With an event study, it is possible to assess the extent of shareholders abnormal returns in the period around the announcement date. An abnormal return equals the difference between the realised returns and an expected benchmark return, which would be generated in case the takeover bid would not have taken place (Martynova and Renneboog, 2008). Typically, the benchmark return used in this approach is either the capital asset pricing model (CAPM) or the Fama-French three-factor model. An M&A announcement brings new information to the market and, if the stock market is efficient, investors' expectations about this new information are immediately and fully reflected in share prices. Therefore, all the value created by the M&A transaction is captured by the abnormal return in a short event window surrounding the announcement date. Announcements will be accompanied by positive returns if the acquisition is value-creative and by negative returns if the acquisition is value-destroying. Typically, a few days before the announcement are included to capture potential information leakages, while including trading days following the announcement allows accounting for any delays in the stock price reaction. Once the abnormal returns (ARs) are calculated, they can be aggregated through time for any security to obtain the Cumulative Abnormal Returns (CARs), the CARs can be further aggregated across all securities to get the Cumulative Average Abnormal Returns (CAARs). In this paper, the estimated CAARs are employed to perform an initial univariate analysis to test the overall significance of the abnormal returns; the CARs are instead used as the dependent variable of multivariate regression analysis. A more detailed outline of the procedure employed to calculate the abnormal returns can be found in *Appendix A.*

Despite its effectiveness and its remarkable impact in the corporate finance literature, this approach has some limitations that have to be considered. First of all, it relies on the efficient market hypothesis (EMH) and assumes investors rationality and the absence of restrictions on arbitrage. Furthermore, the announcement effect reflects accurately the value created by the deal only if the bid is *not anticipated* and is *uncontaminated* with other information regarding the stand-alone value of the firms involved (Golubov, Petmezas and Travlos, 2013). Regarding the first assumption, anticipation can severely complicate the estimation of gains from bidding and should be taken into account to avoid underestimating the value implications. Malatesta and Thompson (1985) demonstrated that investors at least partially anticipate acquisition attempts, implying that the overall economic impact of an acquisition attempt is generally larger and more significant than the estimated announcement effect. Regarding the second assumption, Bhagat et al. (2005) show that tender offer bids are sometimes subject to *bidder-revelation bias*, i.e. the bid reveals information about the value of the bidder not arising from the deal itself. For instance, stock-financed public acquisitions are essentially a joint announcement (a takeover and an equity issue), since the issue of public equity is often associated with an adverse market reaction, acquirer returns could be downward biased (Golubov et al., 2016).

Moreover, although stock markets are relatively efficient and react quickly, there is evidence of stickiness in stock prices (resistance to changes), and investors may need time to process the new information. Thus, the reaction may be delayed. In order to take this effect into account, other approaches try to measure the long-term effect of M&A on shareholders wealth. However, is more challenging to isolate the takeover effect over a more extended period because many variables come into play, holding constant all other factors is not feasible and would make the model excessively complicated or misspecified (Barber and Lyon, 1997; Kothari and Warner, 1997). Studies based on a comparison of performance measures prior and after a takeover suffer from the same problem. In conclusion, the success of the event study approach can be attributed to its ability to provide a direct and forward-looking measure of value created for shareholders and to being theoretically well-grounded.

3.2.Regression Models

To better investigate the impact of social performance on M&A value creation and to disentangle its impact from other value drivers, a multivariate regression analysis is performed. The estimated CARs are used as the dependent variable, while several deal-specific characteristics are used as explanatory variables. A detailed definition of all the variables included in the models can be found in *Appendix B.* Model (1), (2) and (3), include different sets of variables that have proved to have an impact on stock returns around the announcement date:

$$\textbf{\textit{Model (1)}}: CAR(-1,1)_i = \beta_0 + \beta_1(Listed\ Target)_i + \beta_2(All\ cash\ deal)_i + \beta_3(All\ stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_6(Stock\ issue)_i + \beta_7(Cross\ border)_i + \beta_8(Industry\ relatedness)_i + \beta_9(Hostile)_i + \beta_{10}(Competing\ bidders)_i$$

$$\textbf{Model (2)}: CAR(-1,1)_i = \beta_0 + \beta_1(Listed\ Target)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_6(Stock\ issue)_i + \beta_7(Cross\ border)_i + \beta_8(Industry\ relatedness)_i + \beta_9(Hostile)_i + \beta_{10}(Competing\ bidders)_i$$

$$\textbf{Model (3)}: CAR(-1,1)_i = \beta_0 + \beta_1(Listed\ Target)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4(Private\ target)_i * (Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_7(Listed\ target)_i * (Relative\ size)_i$$

The total number of observation used to estimate the model is 3,142. From (1) to (3) some variables are added and some others are dropped in order to find the model that better described the value creation drivers. Some interaction variables are also included to test for differences in marginal effects. Model (4) introduces the variable ESG score in order to verify whether it improves the quality of the model and has some kind of explanatory power.

$$\textbf{Model (4)}: CAR(-1,1)_i = \beta_0 + \beta_1(Listed\ Target)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4(Private\ target)_i * (Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_7(Listed\ target)_i * (Relative\ size)_i + \beta_8(ESG\ score)_i$$

Then, two regression equations are estimated to study the impact of ESG similarity on CARs (5) and Acquisition premium (6), respectively. In both models, a number of control variables is included to avoid any bias in the coefficient estimates. The estimation of a measure of similarity requires ESG data available for both acquirer and target, this result in a smaller sample (N = 376) that includes only public target, thus the variable "Listed target" is dropped from the model.

$$\textbf{Model (5)}: CAR(0,2)_i = \beta_0 + \beta_1(ESG\ Similarity)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_7(Industry\ relatedness)_i$$

$$\textbf{Model (6)}: Acquisition\ Premium_i = \beta_0 + \beta_1(ESG\ Similarity)_i + \beta_2(Competing\ bidders)_i + \beta_3(Tender\ offer)_i + \beta_4(Hostile)_i + \beta_5 Log(Acquirer\ size)_i + \beta_6(Relative\ size)_i + \beta_7(All\ cash\ deal)_i + \beta_8(All\ stock\ deal)_i + \beta_9(Industry\ relatedness)_i$$

The coefficients are estimated using Ordinary Least Squares (OLS) with heteroskedastic and autocorrelation consistent (HAC) standard errors. This measure is necessary since a White (1980) heteroskedasticity test rejects strongly (at even the 1% level) the null hypothesis of homoskedasticity, meaning that any inference based on ordinary s.e. formulae may produce misleading inference. Once the coefficients are obtained, a two-tailed test for significance is conducted for each individual variable to assess whether it has a statistically significant impact or not. A standard F-test for overall significance is also conducted for each model.

4. Data

4.1. M&A Sample

The sample of mergers and acquisitions was collected from Thomson Reuters Securities Data Corporation (SDC) Platinum database. The initial sample include all completed transactions involving US acquirers announced between 1998 and 2017 that satisfy the following criteria:

i. The acquirer is publicly listed
ii. The deal value is at least $10 million
iii. Transactions labelled as acquisitions of minority interest, acquisitions of remaining interest, recapitalisations, exchange offers or repurchases are excluded.
iv. The percentage of target common shares outstanding held by the acquirer at the announcement date is less than 50%, it seeks to own more than 50%, and own more than 50% after the deal completion (i.e. the transactions must involve a change of control).
v. Both the target and the acquiring firm do not operate in the financial sector or in the public sector.
vi. Those acquisitions where the percentage of common shares outstanding acquired is less than 20% are also excluded.

Additionally, stock return data must be available for the acquirer firm in the Center for Research in Security Prices (CRSP) database and acquirer firm characteristics must be available in the Compustat database. This initial screening through SDC identifies 5,852 transactions. Then the sample was further refined to include only those deal whose acquirer is in the KLD database which contains data on ESG, resulting in a final sample of 3,142 transactions.

4.2. ESG data and variables construction

The data to measure a firm's social performance are obtained from the MSCI ESG KLD STATS (KLD) database, an annual data set of positive and negative environmental, social, and governance (ESG) performance indicators applied to a universe of publicly traded companies. It has been extensively used in prior literature and covers approximately 2,600 companies since 1991, which made it one of the longest continuous ESG data time series available. KLD is realised by MSCI ESG Research, a global independent rating agency specialising in assessing corporate social performance across a range of dimensions related to stakeholder interests. It uses a variety of sources to capture firms' performance including macro data at segment or geographic level from academic, government, and NGO datasets, annual surveys, financial reports, proxy statements, and external data sources such as articles in popular press. Therefore, although firms are invited to review all data collected, KLD results are not generally affected by self-reporting issues.

Each annual KLD data set contains a set of indicators assessing positive and negative ESG performance grouped in the three major dimensions: *Environment*, *Social* (broken down in five subcategories:

community, human rights, employee relations, diversity, product), *Governance*. Each of these dimensions comprises several positive or negative indicators, which in previous studies are usually referred to as *strengths* and *concerns* respectively, due to the original rating framework terminology. For example, the environmental dimension includes energy efficiency (strengths), toxic emissions and waste (weakness); the social dimension includes board diversity (strengths), anticompetitive practices (weakness); the governance dimension includes financial system risk (strengths), bribery & fraud(weakness), and many more. The total number of indicators has changed over the years and amounted to 71 in 2016 (latest data). There are also ratings on other "controversial business involvement indicators" alcohol, gambling, tobacco, firearms, military, and nuclear power, which will not be considered in this analysis – a detailed description of all indicators included is reported in *Appendix C*.

The ESG performance indicators are assessed by a binary scoring model that facilitates a quantitative analysis: "1" if a company meets the assessment criteria established for an indicator, "0" if a company does not meet the assessment criteria established for an indicator. If a company has not been researched for a particular ESG indicator, then this is signified with a "NR" (Not Researched). As pointed out by Bereskin et al. (2018), since there are separate subcategories for strengths and concerns, a score of 0 in a strength subcategory does not necessarily mean that a firm is considered socially irresponsible in that dimension but rather that a firm does not show significant commitment. Conversely, a score of 1 in a concern subcategory implies that the firm is subject to severe controversies regarding that dimension.

These data are used to construct two variables: one measure the overall *ESG score* of a company and the other the *ESG similarity* between acquirer and target. In both cases, ESG data for the year preceding the announcement have been used; this to avoid that at the time of the announcement the data was not available and thus incurring in a look-ahead bias.

Regarding the overall ESG score, one of the most popular aggregation methods, used in several studies based on KLD data, has been to take the sum of all strengths net of the sum of all concerns to arrive at a single ESG score for each dimension (Waddock and Graves, 1997; Johnson and Greening, 1999; Ruf et al., 2001; Levine et al., 2008). However, as noted by Manescu (2009), the drawback of this approach is the lack of comparability across years because the number of strength and concerns indicators have varied over time. To overcome this problem, a relative measure was constructed by dividing the numbers of strengths and concerns in each dimension by the respective total numbers of strength and concern indicators in that year, deriving standardised scores. The following step is taking the difference between the standardised strength score and the standardised concern score in each dimension:

$$dimesion\_ESG_t^i = \frac{\sum_{s=1}^{u_t^i} strength_s^i}{u_t^i} - \frac{\sum_{c=1}^{k_t^i} concern_c^i}{k_t^i}$$

Where: $\boldsymbol{dimesion\_ESG_t^i}$ = standardised ESG score for the dimension i at year t;

$\boldsymbol{strength_s^i}$ = strength indicator, equal to 1 if the firm meets strength s, i and 0 otherwise;

$\boldsymbol{u_t^i}$ = total number of strengths for dimension i, year t;

$\boldsymbol{concern_c^i}$ = concern indicator, equal to 1 if the firm meets concern c, i and 0 otherwise;

$\boldsymbol{k_t^i}$ = total number of concerns for dimension i, year t.

Finally, the annual overall ESG Score of a firm is the arithmetic average of its three dimensions: Environment (E), Social[5] (S), Governance(G)

$$ESG\ Score_t = \frac{1}{3}\sum_{i=1}^{3} dimension\_ESG_t^i$$

This score is bounded between [-1, 1] and can be compared across different years. Furthermore, by giving equal weight to each dimension and not to the individual indicators, it mitigates any bias caused indicators that are relatively irrelevant in specific industries (Deng, Kang and Low, 2013).

Measuring ESG similarity is less intuitive. In fact, comparing the overall ESG performance of target and acquirer is not a good practice and could be misleading. The reason is that the overall score facilitates the understanding with a synthetic number but at the cost of reducing the degree of granularity. For clarity, assume that the acquiring-firm has a strength in "employee involvement" and a concern in "child labour", while the target has a strength in "supply chain labour standards" and a concern in "collective bargaining & unions", all of this indicators are under the category: employee relation. Although the two company have a substantially different ESG profile, at the aggregate level is not possible to discern it, and they will have the same score. This implies that the correlation between overall ESG scores and the ESG similarity is not necessarily positive. Two firms may both score high in overall ESG while having a low similarity score if they have strengths and concerns in different indicators. The opposite is also true: different overall scores may result in high similarity.

It is also worth noting that, given a particular indicator (either a strength or a concern), a score equal to 1 is much more informative than a score equal to 0. This because the 0 is the default score and a company is not given 1 in an indicator unless it shows a significant deviation from the average. Therefore, the similarity measure has to assign a higher weight to a pair of 1s than to a pair of 0s.

Following Bereskin et al. (2018), to overcome these issues, the Jaffe's (1986) distance (also known as cosine similarity) is employed to calculate the ESG similarity. This is simply the dot product of two vectors divided by the product of their length. Given two firms α and β, the ESG similarity between the two is given by:

$$ESG\ Similarity_{\alpha\beta,t} = \frac{\sum_{i=1}^{n} \alpha_{i,t}\beta_{i,t}}{\sqrt{\sum_{i=1}^{n} \alpha_{it}^2}\sqrt{\sum_{i=1}^{n} \beta_{it}^2}} = \frac{\boldsymbol{X}_{\alpha,t} \cdot \boldsymbol{X'}_{\beta,t}}{\sqrt{\boldsymbol{X}_{\alpha,t} \cdot \boldsymbol{X'}_{\alpha,t}} \cdot \sqrt{\boldsymbol{X}_{\beta,t} \cdot \boldsymbol{X'}_{\beta,t}}}$$

[5] Note that the *Social* dimension is computed by taking the average of its five subcategories

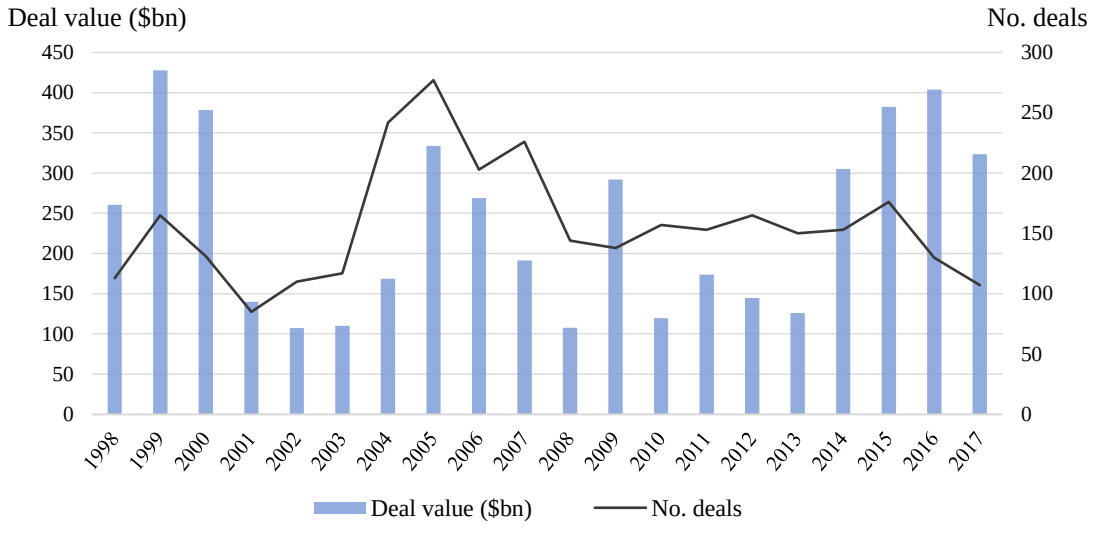
Where the vectors $\boldsymbol{X}_{\alpha,t}$ and $\boldsymbol{X}_{\beta,t}$ correspond to firm $\alpha's$ and firm $\beta's$ ESG scores in each indicator. According to the *Cauchy–Schwartz inequality*, the value of this variable is bounded between [0, 1], with a value of 1 indicating a perfect match between all strengths and all concerns of two the firms (the two vectors are parallel) and a value of 0 indicating no match between the two ESG profiles (the two vectors are orthogonal).

The Jaffe's (1986) distance is particularly suited in this case because it measures similarity only between non-zero values, thus between those indicators where the firms show actual involvement and score 1, the indicators where both firms have 0 (their involvement is not different enough than the average) to not contribute to the measure. As noted by Bereskin et al. (2018), the KLD data involve vectors with large dimension and frequent scores of 0; Thus a distance measure that treats 0s and 1s equally (e.g. the Euclidian distance) would overestimate ESG similarity between companies that show poor proactive engagement – i.e. have a small number of positive values. Nonetheless, this measure is potentially flawed when both the acquirer and the target have a high number of null values. In the event that two vectors have all null values except a few positive coincident values, their similarity would be maximum and greater than that of two vectors with many coincident positive values but few discordant, though the latter could be considered closer than the former.

4.3. Summary statistics

The volume of the deals included in the sample is reported in *Figure 1*. Both the deal value and the number of deals are not evenly distributed over the years mirroring approximately the overall M&A activity in the US market across the same period. (A more detailed representation is shown in *Appendix D.1*).

Figure 1 *– Total deal value and number of deals*



The number of transactions in the sample is 3,142, and the total deal value is $4,765bn, resulting in average deal value of roughly $1.5bn. *Appendix D.2* compares the total deal value of deals included in

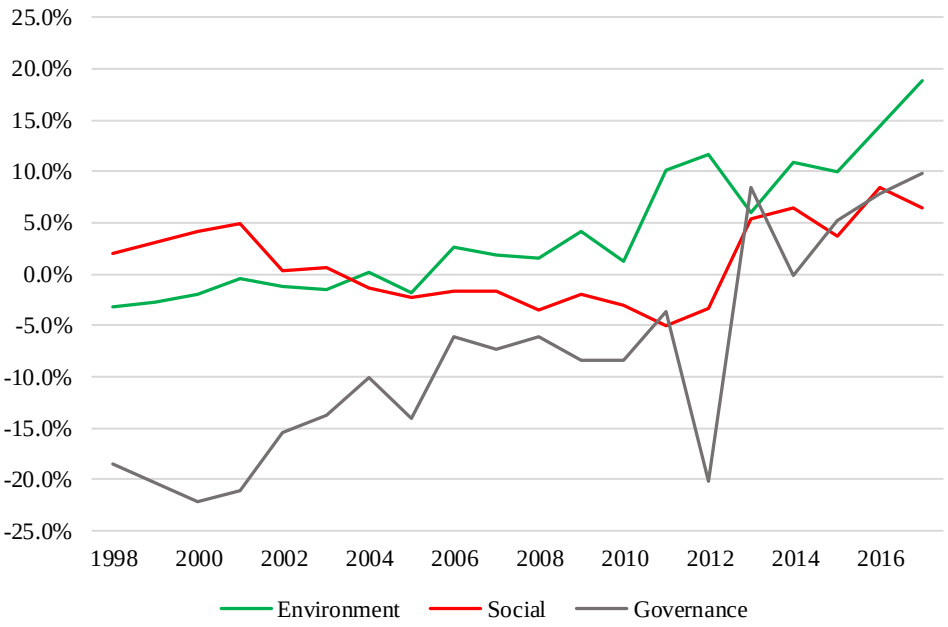
the initial sample with those included in the final sample which comprises only those deal whose ESG data for the acquirer is available in the KLD database, the ratio is relatively large (73% overall) and has slightly increased over time. A breakdown of the transactions according to the macro industry in which the acquirer and the target operate is shown in *Appendix D.3*, while the deal-specific characteristics are illustrated in *Figure 2*. The majority of deals (48%) have been completed using a mixed form of payment (i.e., involving both cash and stock or other securities), the fraction of all-cash deals is 39%, and the remaining 13% are all-stock deals, this latter form of payment is more frequent in the first half of the sample period. Regarding the listing status of the target, the transactions are almost equally split between those involving the acquisition of a listed target (47.2%) and those involving the acquisition of a private target (52.8%). A significant fraction of transactions consists of cross-border acquisitions (21%), while those involving competing bidders or defined as "hostile" by the target board are only 2.5% and 0.5% respectively. Finally, 2316 out of 3142 transactions are classified as related acquisitions (i.e., the buyer and the seller operate in the same business).

Figure 2 *– Deal-specific characteristics of the sample*

Deal-specific Characteristics											
Year	All-cash	All-stock	Mixed	Listed Target	Private Target	Cross-broder	Comp. Bidders	Hostile	Stock Issue	Related Industry	Relative Size
1998	30	42	41	81	32	19	3	0	4	87	17.4%
1999	45	67	53	115	50	26	4	5	0	113	20.8%
2000	28	45	58	78	53	23	3	3	3	89	12.2%
2001	24	29	32	62	23	17	5	2	1	66	15.8%
2002	41	23	46	58	52	21	3	1	3	86	7.3%
2003	40	16	61	59	58	22	2	1	1	89	14.0%
2004	88	25	129	96	146	53	8	2	7	182	22.6%
2005	110	21	146	115	162	57	13	2	1	199	19.2%
2006	91	17	95	104	99	40	5	0	2	147	28.9%
2007	104	17	105	106	120	47	2	0	2	174	24.6%
2008	60	10	74	63	81	35	6	0	4	113	21.3%
2009	52	13	73	64	74	29	8	0	1	99	21.6%
2010	85	8	64	72	85	40	3	0	4	115	27.2%
2011	60	7	86	43	110	41	1	1	4	101	22.6%
2012	87	7	71	70	95	42	0	0	4	119	21.5%
2013	62	8	80	46	104	37	1	0	9	110	21.9%
2014	74	10	69	55	98	34	2	0	6	123	21.2%
2015	66	14	96	69	107	31	3	0	16	118	30.5%
2016	45	15	70	72	58	25	4	0	10	107	28.7%
2017	38	10	59	54	53	22	4	0	1	79	26.6%
Total	**1230**	**404**	**1508**	**1482**	**1660**	**661**	**80**	**17**	**83**	**2316**	**21.9%**
% sample	**39.1%**	**12.9%**	**48.0%**	**47.2%**	**52.8%**	**21.0%**	**2.5%**	**0.5%**	**2.6%**	**73.7%**	

Figure 3 shows how the ESG performance of acquirers, for each of the three dimensions, has evolved over the period of time examined. The Environment performance of the firm in the sample has steadily increased over the last two decades, the Social dimension has remained quite stable reverting around zero, the Governance performance has also raised but following a more erratic pattern. Overall, the average ESG score has moved from negative territory to positive values in the last quarter of the sample period.

Figure 3 *– Acquirers ESG Performance (1998-2017)*



5. Results

This section provides an analysis of the acquirer M&A announcement returns and investigates the impact of the ESG performance in shareholder value creation. The first part is proposed to assess whether acquirers that are more socially responsible engage in M&A transactions that generate more value for their shareholders. To test this hypothesis, the approach proposed by Deng, Kang and Low (2013) has been applied, using both a univariate test and a multivariate regression analysis. The second part builds upon the contributions of Bereskin et al., (2018) and Krishnamurti et al. (2019) to analyse the impact of ESG similarity on M&A performance, using both at acquirer returns and bid premiums as dependent variables.

5.1. Univariate test

Table 1 shows the cumulative average abnormal returns for the shareholders of the acquiring firms for five different event windows and using both the market model and the three-factor model to estimate the normal returns. As expected, the two models yield similar results with a negligible difference. The CAARs are reported for the full sample of acquirers (3142) as well as for the two subsamples of high and low ESG acquirers, which include 1421 and 1721 observations, respectively. Any acquiring firm is assigned to its subsample depending on whether it has an ESG Score above or below the average of the full sample. In addition, *Figure 4* provides a better understanding of the data reported in the table by showing a graphical representation of the abnormal returns over the 11-day period around the announcement date.

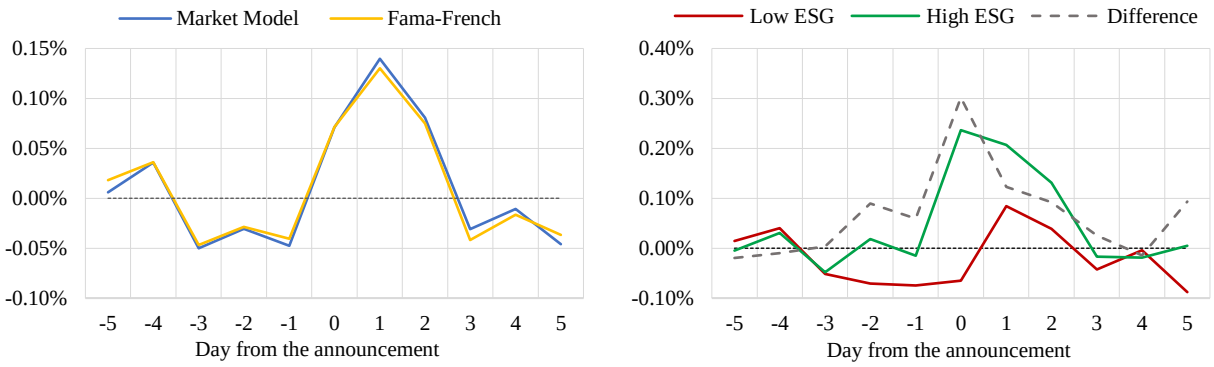
Table 1 *– Results of the univariate test*

Acquirer CAARs (percentage)	Full sample (N=3142)		High ESG score: A (N=1421)		Low ESG score : B (N=1721)		Test of difference (A-B)	
	Market M.	Three-factor M.	Market M.	Three-factor M.	Market M.	Three-factor M.	Market M.	Three-factor M.
CAAR (0, 1)	0.211*	0.202*	0.443**	0.442**	0.019	0.003	0.424*	0.439*
	(0.080)	*(0.092)*	*(0.022)*	*(0.021)*	*(0.900)*	*(0.985)*	*(0.084)*	*(0.071)*
CAAR (0, 2)	0.291**	0.276**	0.574***	0.538***	0.058	0.060	0.516**	0.478*
	(0.021)	*(0.027)*	*(0.004)*	*(0.007)*	*(0.717)*	*(0.705)*	*(0.044)*	*(0.061)*
CAAR (-1, 1)	0.163	0.161	0.428**	0.430**	-0.055	-0.060	0.483*	0.490*
	(0.192)	*(0.194)*	*(0.032)*	*(0.030)*	*(0.726)*	*(0.701)*	*(0.057)*	*(0.052)*
CAAR (-2, 2)	0.213	0.207	0.577***	0.543**	-0.088	-0.071	0.665**	0.614**
	(0.113)	*(0.123)*	*(0.007)*	*(0.010)*	*(0.611)*	*(0.682)*	*(0.015)*	*(0.024)*
CAAR (-5, 5)	0.117	0.119	0.525**	0.501**	-0.219	-0.196	0.743**	0.697**
	(0.467)	*(0.461)*	*(0.038)*	*(0.048)*	*(0.296)*	*(0.350)*	*(0.023)*	*(0.034)*

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

The CAARs of the full sample are positive for all the windows considered and irrespective of the model employed to estimate the normal returns, but only CAAR (0, 2) is significant at the 5% level – the probability that a CAAR is different from zero is reported in brackets. The subsamples results show that these positive returns are mostly driven by high ESG acquirers. The CAARs for high ESG acquirers are positive and significant, while CAARs of low ESG acquirers are not significant and negative most of the times. The test of difference shows that the equality of CAARs between high and low ESG firms is rejected at 5% level for CAAR (-2, 2) and CAAR (-5, 5) and at 10% level for the other event windows.

Figure 4 *– Abnormal returns of the full sample (left) and the subsamples (right)*



These results support the stakeholder value maximisation theory, firm that invest more in ESG seem to realise higher announcement returns that ultimately benefit shareholders wealth. A potential explanation is that firms that are considered more socially responsible are less driven by managerial self-interest and tend to engage in acquisitions that are more value-creative. Besides, firms with higher ESG score have a better reputation for keeping their commitments to fulfil implicit contracts and are more likely to engage better with stakeholders of the firm. These characteristics facilitate the post-closing integration process, meaning that target firms may be willing to accept less favourable explicit contact.

Overall, the results are consistent with those reported by Deng et al. (2013) and are innovative in using a larger and more recent sample of deals, in addition, this sample includes not only mergers but also acquisitions, and the mean difference is still positive and significant.

5.2. Multivariate regression analysis

This section articulates in the following way: the first part provides a discussion over the impact of various deal-specific characteristics on acquirer's returns, then the ESG score in added to the regression model to check whether the multivariate regression corroborates the findings obtained with the univariate test

The cross-sectional regression analysis is conducted using acquirer CARs (-1, 1) as a dependent variable and the deal characteristics described in the literature review as explanatory variables. *Table 2* shows the results of four different regression models. Each column reports the coefficients (express in percentage), and the respective p-values (in brackets) for the variables included in the model, together with the adjusted R^2 of the regression.

Regarding the listing status of the target, model (1) and (2) show that the coefficient of "Listed target" – a dummy variable equal to 1 if the target is publicly traded and 0 otherwise – is substantially negative and statistically significant at the 1% level. This result is consistent with Fuller et al. (2002) and supports the limited competition hypothesis – i.e., the acquirers capture an illiquidity discount by acquiring a private target, while in the case of a public target the market is competitive and no positive abnormal returns are generated. However, the explanatory power of the first to models is relatively low, and when different variables are included the listing status of the target becomes no longer significant in explaining abnormal returns.

The choice of the method of payment also has a significant impact on the CARs. It seems to be a positive relationship between all-cash payments and abnormal returns. One reason could be that an all-cash offer is often associated with a higher probability of completion due to the smaller uncertainty regarding the total value of considerations at the closing date. By contrast, all-stock offers do not have a significant impact on abnormal returns. In model (2) the variable "All-stock deal" is replaced by the variable "Stock deal", the latter is a dummy equal to one if the acquiring firm uses at least some stock to finance the acquisition, and zero otherwise. In this case, the marginal impact of the all-cash offer is still positive and significant while offers that include acquirer stock reduce CARs by approximately one percentage point. The results support the signalling hypothesis: managers are more likely to offer stock as means of payment when they believe that their firm is overvalued, a stock offer signals the market that acquirer share price is higher than its intrinsic value and investors react negatively. To further investigate this effect, in model (3) the interaction variable "Listed target*Relative size" is introduced to accommodate differences in the marginal effect of stock offers for public and private targets. The findings suggest that the negative effect of offering common stock is explained only by acquisitions of listed targets; in

fact, bidders offering common stock experience higher abnormal returns when the target firm is privately held. The results are consistent with Chang (1998) and can be explained by the monitoring hypothesis: ownership in private targets is usually concentrated. Thus, a stock offer tends to create an outside blockholders that have a stronger incentive to discipline and monitor incumbent management.

Table 2 *– Results of the multivariate regression analysis – model (1), (2), (3), (4)*

Dependent variable: Acquirer CAR (-1, 1)
Method: Least Squares with HAC standard errors

	(1)	**(2)**	**(3)**	**(4)**
Constant	1.620**	2.009***	1.669**	1.721**
	(0.016)	*(0.003)*	*(0.044)*	*(0.040)*
Listed target	-1.607***	-1.474***	0.490	0.490
	(0.000)	*(0.000)*	*(0.113)*	*(0.113)*
All-cash deal	1.174***	0.778***	0.192	0.192
	(0.000)	*(0.005)*	*(0.480)*	*(0.482)*
All-stock deal	-0.701			
	(0.162)			
Stock deal		-1.009**	-2.770***	-2.753***
		(0.010)	*(0.000)*	*(0.000)*
Private Target * Stock deal			3.153***	3.146***
			(0.000)	*(0.000)*
Log (Acquirer size)	-0.129*	-0.139**	-0.185**	-0.191**
	(0.075)	*(0.048)*	*(0.022)*	*(0.020)*
Relative size	0.992*	1.076*	4.130**	4.115**
	(0.073)	*(0.057)*	*(0.036)*	*(0.036)*
Listed target * Relative size			-4.144**	-4.132**
			(0.034)	*(0.035)*
Stock issue	-1.006	-0.946		
	(0.454)	*(0.481)*		
Cross-border	-0.294	-0.386		
	(0.251)	*(0.140)*		
Industry relatedness	-0.133	-0.090		
	(0.646)	*(0.757)*		
Hostile	-0.562	-0.607		
	(0.617)	*(0.593)*		
Competing bidders	-0.550	-0.472		
	(0.391)	*(0.455)*		
ESG score				0.737
				(0.341)
Sample size	3,142	3,142	3,142	3,142
Adjusted R-squared	2.5%	2.6%	6.0%	6.1%

The acquirer size also influences CARs, the coefficient of this variable is negative and significant across all the models, meaning that the larger the acquirer market capitalisation, the lower its abnormal returns at announcement date. A potential explanation is that firm size is a proxy for the extent of agency costs, managers of large firms are usually more prone to engage in value-destroying acquisition and overpay for the target (Roll, 1986). The effect of the relative size, defined as the deal value divided by acquirer's market capitalisation, appears in the first instance to be positively related to abnormal returns. However, adding an interaction variable (as in the case of the method of payment) reveals that for public targets, the larger the seller relative to the buyer, the more negative the acquirer CAR, while for deals involving private targets the opposite is true. These findings corroborate those of Fuller et al. (2002) and are justified by the fact that large public targets have a stronger bargaining power thus tend to obtain a more favourable price, by contrast, private targets may be less incentivised to negotiate given the desire to cash out.

In column (4) the variable "ESG score" is added to the regression model (3) in order to analyse its impact on acquirer CARs, its marginal effect is positive (0,737) but not statistically significant. Thus, after controlling for a number of firm- and deal-specific characteristics, there is no evidence that shareholders of high ESG acquirers realise higher returns than those of low ESG acquirers. The contradiction with the result in the univariate test may be due to the fact that a firm's social performance is correlated with other variables. With an event study analysis is not possible to disentangle the impact of these variables on CAAR, and there is the risk of incurring misleading inference. In conclusion, although in the univariate test, firms with high ESG performance seem to generate more value than their peers with low ESG performance, this effect is no longer significant when controlling for other variables. These results suggest that the acquirer's social performance has a limited impact on value creation through M&A activity and indicate that further research is still needed.

5.3. ESG similarity and M&A performance

While the previous part has focused on the overall level of ESG performance of acquiring firms, this section builds upon the contribution of Bereskin et al. (2018) and investigates the role of similarities in ESG policies between acquiring and target firms involved in the M&A transactions. The ESG similarity is a good proxy of cultural fit between firms, and the latter is often regarded as a crucial factor for successful post-closing integration. How smoothly post-closing integration occurs substantially impacts the extent to which synergies are realised and how much value is created for shareholders. If this is true, then the level of ESG performance similarity should have a positive impact on the value created for the shareholders. This hypothesis is tested using a linear regression model with CAR (0, 2) as the dependent variable and ESG Similarity and other deal-specific characteristics as independent variables. *Table 3* shows the estimated output of ordinary least-squares (OLS) regression. The sample size is smaller (N = 376) because this analysis requires ESG data available for both acquirer and target. This restriction

results in a sample that includes only public targets; thus, the variable "Listed target" is dropped from the model.

Table 3 *–ESG Similarity and Acquirer CAR – model (5)*

Dependent variable: Acquirer CAR (0, 2)
Method: Least Squares

	Coefficient	t-Statistic	Probability
ESG Similarity **	2.669	2.058	0.040
All-cash deal	-1.190	-0.933	0.352
Stock deal ***	-5.464	-4.258	0.000
Log (Acquirer size) ***	-0.534	-2.614	0.009
Relative size	-0.557	-1.216	0.225
Industry relatedness	0.031	0.038	0.970
Constant ***	6.333	2.728	0.007
N	376		
Adjusted R-squared	9.8%		

The coefficient of ESG Similarity is positive and significant at the 5% level, even after controlling for a number of firm- and deal-specific characteristics. This result strongly suggests that investors expect the realisation of greater synergies between firms with higher ESG similarity and react positively when these deals are announced. Therefore, there is evidence that the acquisition of firms with ESG policies close to the bidder generate more value for acquiring shareholders, as this decision is perceived to be value-creating.

Furthermore, target firms that have similar ESG profiles and share the same values with acquiring firms may be less incentivised to negotiate the acquisition price or resist takeover attempts. This because the target board is more confident that post-closing integration will occur smoothly and that its stakeholders will benefit more. Therefore, it can be argued that acquirers with ESG performance close to the target are unlikely to pay higher bid premiums to acquire it. This hypothesis is tested using a linear regression model with acquisition bid premium as the dependent variable and ESG Similarity as the independent variable, the model also includes a number of control variables that are deemed to have an impact on the premium. The bid premium is defined as the ratio of the total deal value to the target firm market capitalisation one week before the M&A announcement date minus one. *Table 4* presents the estimated output.

Table 4 *–ESG Similarity and Acquisition Premium – model (6)*

Dependent variable: Acquisition Premium
Method: Least Squares

	Coefficient	t-Statistic	Probability
ESG Similarity **	-15.436	-2.149	0.032
Competing Bidders ***	23.884	3.159	0.002
Tender Offer ***	14.747	3.022	0.003
Hostile	7.771	0.560	0.576
Log (Acquirer size) **	2.457	2.161	0.031
Relative size	1.775	0.701	0.483
All-cash deal	1.609	0.369	0.712
All-stock deal	-5.928	-1.078	0.282
Industry relatedness	4.732	1.041	0.299
Constant	7.705	0.661	0.509
N	373		
Adjusted R-squared	9.7%		

The results support the proposition that a higher level of ESG similarity is associated with a lower acquisition premium as indicated by the negative and significant coefficient of ESG Similarity. These findings are consistent with the expectation that the similarity between ESG profiles creates value for acquiring shareholders through the M&A process. Regarding the other variables, the presence of competing bidders is unsurprisingly associated with larger bid premiums, because of the competition between multiple prospective buyers that props up the offered price. Tender offers are also positively related to bid premiums because, with this takeover tactic, the bidder reaches target's shareholders directly and has to offer a higher price to induce them to sell their shares. Finally, the hubris hypothesis can explain the positive coefficient of acquirer size: the larger the firm, the greater the extent of agency costs and the probability of overpayment.

6. Conclusions

This paper has investigated the relationship between social performance and shareholders value creation in M&A deals. In recent years corporate sustainability has been getting renewed attention with a focus on Environmental, Social and Governance (ESG) factors. Despite the growing interest among practitioners and researchers, the impact of social performance on financial performance is still subject to much debate, and empirical evidence is still scarce. This paper joins the existing literature with the aim of clarifying the implications of ESG in corporate takeovers.

More specifically, a sample of 3,142 M&A deal completed by US acquirers between 1998 and 2017 has been selected and studied. Two different methodologies have been applied to test the research

hypotheses: event study and multivariate OLS regression. The first research hypothesis is that firms with higher ESG score engage in acquisitions that are more value-creative. The explanation is that firms that are considered more socially responsible are less driven by managerial self-interest; they also have a better reputation for keeping their commitments which encourage the target to accept less favourable explicit contracts. Supporting this view, the event study analysis suggests that acquirers with higher ESG score realise M&A transactions that generate more value for their shareholders. However, these findings are not supported by the regression analysis; thus, it cannot be ruled out that this effect is actually caused by other deal-specific characteristics. The attention then shifts to the level of social performance similarity between the acquirer and the target, the pairwise closeness of any two firms' ESG profiles are calculated in this regard. Post-closing integration is a crucial factor for successful M&A, if two firms share the same corporate culture and social commitment, the integration is likely to occur smoothly, and the expected synergies are easier to materialise. Therefore, the expectation is that the level of social performance closeness should have a positive impact on the value created for the shareholders. The results support this hypothesis by showing a positive and significant impact of ESG similarity on bidder's abnormal returns. Consistently, the acquisition premium offered by the bidder is negatively related to the degree of similarity, meaning that the target's management may be less incentivised to negotiate the acquisition price if it believes that post-closing integration will be easier and that its stakeholders will benefit more. Overall, the results suggest that what contributes to shareholders value creation in M&A transactions is not so much the overall acquirer's ESG performance, but rather the level of ESG similarity between this and the target.

The focus of this paper is on M&A value creation in the short term. If markets are efficient, new information is immediately reflected in stock price, and the value created by the transaction is fully captured by the abnormal returns following the announcement date. However, most of the times, investors need time to process all the information, especially when it comes to ESG information that is not always standardised and easy to interpret. For future research, an analysis of the long-term impact of social performance on M&A transaction would be of great benefit. Further analysis of post-deal integration and likelihood of completion is also useful to get a better understanding of the relationship between social responsibility and shareholder value creation. Finally, as non-financial information becomes more standardised, available and comparable, future research will have access to a larger volume of data with better quality to refine the present findings.

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Appendix

Appendix A – CAARs estimation

If new information is immediately reflected in stock prices – i.e. the stock market is efficient – the event's economic impact can be measured by examining the return behaviour in the short period around the announcement. For each security i, its return for the time period t is:

$$R_{i,t} = E(R_{i,t}) + AR_{i,t}$$

Where: $R_{i,t}$ is the actual/observed return, $E(R_{i,t})$ is the expected/normal return, and $AR_{i,t}$ is the abnormal return. Thus, the abnormal return is the difference between the actual return and the normal return that would be expected if the event did not take place and represents the unexpected change in security holder wealth related to the event.

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

The normal returns for a given security can be calculated in different ways. The easiest is the mean adjusted return model, which assumes that the expected return for a given security is equal to a constant:

$$R_{i,t} = k_i + \varepsilon_{i,t}$$

$$with \quad E(\varepsilon_{i,k}) = 0 \quad and \quad Var(\varepsilon_{i,t}) = \sigma_{\varepsilon_i}^2$$

Despite its simplicity, Brown and Warner (1980) find that most of the time its power in detecting abnormal returns is not worse than more sophisticated models. A potential improvement of the mean adjusted return model is the market model, which assumes that the return on a security depends only on the return on the market portfolio (R_m):

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

$$with \quad E(\varepsilon_{i,k}) = 0 \quad and \quad Var(\varepsilon_{i,t}) = \sigma_{\varepsilon_i}^2$$

Restricted versions of the market model are i) the market-adjusted-return model, which set $\alpha_i = 0 \; and \; \beta_i = 1$ and ii) the Capital Asset Pricing Model (CAPM), which assumes α_i equal to zero in the long run. The CAPM is based on the economic theory and states that the expected return on a security is equal to the risk-free rate (R_f) plus a risk premium, which is equal to the beta of that security times the equity risk premium:

$$E[R_i] = R_f + \beta_i(E[R_m] - R_f)$$

The CAPM is an equilibrium model and says that investors are compensated only for bearing the market risk, given by the extent of beta. It has been widely used in event studies during the 1970s; however, its validity has been questioned as a result of anomalies evidence and has been consequently improved by Fama and French (1993) with the three-factor model reported below:

$$E[R_i] = R_f + \beta_i(E[R_m] - R_f) + \beta_i^{SMB} E[R_{SMB}] + \beta_i^{HML} E[R_{HML}]$$

Where:

R_{SMB} is the difference between the return on the portfolio of "small" stocks (market value of equity below the median) and "big" stocks (market value of equity above the median);

R_{HML} is the difference between the return on the portfolio of "high" (greater than the 70th percentile) and "low" (lower than the 30th percentile) book-to-market stocks;

Relaxing the assumption that α_i is equal to zero, the three-factor model becomes an extended version of the market model:

$$R_{i,t} = R_f + \alpha_i + \beta_i\left(R_{m,t} - R_f\right) + \beta_i^{SMB}\left(R_{SMB,t}\right) + \beta_i^{HML}\left(R_{HML,t}\right) + \varepsilon_{i,t}$$

$$with \quad E\left(\varepsilon_{i,k}\right) = 0 \quad and \quad Var\left(\varepsilon_{i,t}\right) = \sigma_{\varepsilon_i}^2$$

Irrespective of whether these factors represent equilibrium compensation for additional sources of risks or are an indication of market inefficiency, it is important to use them when measuring abnormal returns. The final purpose of an event study is to isolate the effect of an event on security prices, and without including the factors mentioned above, it would not be possible to disentangle the performance associated solely to the event itself (Kothari, Leone, and Wasley, 2005). In practice, however, the gains from employ a multifactor model for event studies are limited because the marginal explanatory power of additional factors beyond the market factor is negligible MacKinlay (1997). In this study, the expected returns required to measure the abnormal returns are estimated using both the market model and the three-factor model, with slightly different outcomes. The respective formulas are reported below:

Market Model: $AR_{i,t} = R_{i,t} - \left[R_f + \alpha_i + \beta_i\left(R_{m,t} - R_f\right)\right]$

Three-factor Model: $AR_{i,t} = R_{i,t} - \left[\left(R_f + \alpha_i + \beta_i\left(R_{m,t} - R_f\right) + \beta_i^{SMB}\left(R_{SMB,t}\right) + \beta_i^{HML}\left(R_{HML,t}\right)\right]\right.$

All returns are measured using a daily frequency, the risk-free rate is measured using the annualised three-month Treasury bill, and the market return is proxied by the CRSP value-weighted NYSE/AMEX/Nasdaq index return. The estimation period over which the parameters of the model (α and β) are estimated is [-200, -20], and the minimum number of non-missing return observations within the estimation window is 100. The event period itself is not included in the estimation period to prevent the event from influencing the model's parameters estimates. A gap period – number of trading days between the end of estimation window and the beginning of the event window – allows to reduce the likelihood that the model estimation is affected by the event-induced return variance, that may bias the estimates. The event window – the period of time (in trading days) over which the security prices of the firms involved are examined – is set at [-1, +1], all day notation is relative to the event date (day 0). The day preceding the announcement is included to capture price movements resulting from information leakages, while including a trading day following the announcement allows accounting for any delays in the stock price reaction. As a robustness test, longer and different event windows also examined.

Once the abnormal returns are calculated, they are aggregated through time for any security. Since the returns calculated are continuously compounded: $R_{i,t} = ln(P_{i,t} / P_{i,t-1})$, the cumulative abnormal return (CAR) is given by adding up the 1-day abnormal returns:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

Where t_1 *and* t_2 are the beginning end the end of the event window, respectively, e.g. $CAR_i(-1, 1)$ is the cumulative abnormal return of firm i in the period of time from one day before the announcement to one day following the announcement. 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:

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

Where *N* is the number of securities included in the sample. The significance of CAAR can be assessed by using an ordinary cross-sectional t-test, where the null hypothesis is that the average of the CARs is not different from zero – i.e., $H_0: CAAR = 0$. The test statistic is given by:

$$t_{CAAR} = \frac{CAAR - 0}{\hat{\sigma}_{CAAR}/\sqrt{N}} \sim t_{(N-2)}$$

With:

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

Which distributes as a student's t-distribution with N-2 degrees of freedom under the null hypothesis. It is common that the variance of abnormal returns changes because of the event itself. The ordinary cross-sectional test allows for the event-induced variance but assumes that abnormal returns among securities are independent. If the events tend to cluster in calendar time, the assumption of no cross-sectional dependence in violated and the estimates are biased.

The test for difference between means changes depending on the size of the subsamples and the dependence between them. For large and independent samples the test statistic follows a normal distribution under the null hypothesis of equal means $H_0: CAAR_A - CAAR_B = 0$ and can be implemented by:

$$Z_0 = \frac{(CAAR_A - CAAR_B)}{\sqrt{\sigma_A^2/N_A + \sigma_B^2/N_B}} \sim N(0,1)$$

Where $\hat{\sigma}_A^2$, $\hat{\sigma}_B^2$ and N_A , N_B are the variance and the number of observations included in the two samples.

Appendix B – Variables definition

This appendix contains a detailed description of all the variables included in the models

Listed Target: is a dummy variable equal to 1 if the target was listed on a stock exchange at the deal announcement date, and 0 otherwise.

Private Target: is a dummy variable equal to 1 if the target was privately held at the deal announcement date, and 0 otherwise

All-cash deal: is a dummy variable equal to 1 if the percentage of consideration paid in cash is 100% and 0 otherwise.

All-stock deal: is a dummy variable equal to 1 if the percentage of consideration paid in stock is 100% and 0 otherwise.

Stock-deal: is a dummy variable equal to 1 if the consideration paid include a stock and 0 otherwise.

Log(Acquirer Size): is the natural logarithm of the acquirer's equity market capitalisation measured one month before the announcement.

Relative Size: is defined as the deal value divided by the acquirer's equity market capitalisation measured one month before the announcement.

Stock Issue: is a dummy variable equal to 1 if the transaction was financed through a common stock offering, and 0 otherwise

Cross-border: is a dummy variable equal to 1 if the acquirer and the target firm is incorporated in a state other than US, and 0 otherwise.

Industry Relatedness: is a dummy variable equal to 1 if the acquirer and the target firm operate in the same macro industry (their first 2-digit US SIC code are equal), and 0 otherwise.

Hostile: is a dummy variable equal to 1 if the acquirer is hostile, and 0 otherwise. Hostile is defined as in SDC and refers to takeovers where the target board officially rejects the offer, but the acquirer persists with the takeover

Competing Bidders: is a dummy variable equal to 1 if a third party launched an offer for the target while the original bid was pending, and 0 otherwise.

Tender Offer: is a dummy variable equal to 1 if a tender offer is launched for the target. A tender offer is a formal offer of determined duration to acquire a public company's shares made to equity holders.

Bid Premium: is equal to the ratio of the total deal value to the target firm market capitalisation one week before the M&A announcement date minus one.

ESG Score: $ESG\ Score_t = \frac{1}{3}\sum_{i=1}^{3}\left(\frac{\sum_{s=1}^{u_t^i} strength_s^i}{u_t^i} - \frac{\sum_{c=1}^{k_t^i} concern_c^i}{k_t^i}\right)$

ESG Similarity: $ESG\ Similarity_{\alpha\beta,t} = \frac{\sum_{i=1}^{n}\alpha_{i,t}\beta_{i,t}}{\sqrt{\sum_{i=1}^{n}\alpha_{it}^2}\sqrt{\sum_{i=1}^{n}\beta_{it}^2}} = \frac{\boldsymbol{X}_{\alpha,t}\cdot\boldsymbol{X'}_{\beta,t}}{\sqrt{\boldsymbol{X}_{\alpha,t}\cdot\boldsymbol{X'}_{\alpha,t}}\cdot\sqrt{\boldsymbol{X}_{\beta,t}\cdot\boldsymbol{X'}_{\beta,t}}}$

Appendix C – KLD ESG Components

This appendix contains a list of all indicators included in the latest KLD dataset (2015). The indicators are grouped by the three categories: Environment, Social (broken down in five subcategories: community, human rights, employee relations, diversity, product), and Governance. The strengths are reported in blue and the concerns in orange.

ENVIRONMENT

Strengths

Environmental Management Systems

Pollution & Waste - Electronic Waste

Pollution & Waste - Toxic Emissions and Waste

Pollution & Waste - Packaging Materials & Waste

Natural Capital - Water Stress

Natural Capital - Biodiversity & Land Use

Natural Capital - Raw Material Sourcing

Environmental Opportunities - Environmental Opportunities in Clean Tech

Environmental Opportunities - Opportunities in Green Building

Environmental Opportunities - Opportunities in Renewable Energy

Climate Change - Carbon Emissions

Climate Change - Financing Environmental Impact

Climate Change - Energy Efficiency

Climate Change - Product Carbon Footprint

Climate Change - Climate Change Vulnerability

Environment - Other Strengths

Concerns

Toxic Emissions and Waste

Energy & Climate Change

Biodiversity & Land Use

Operational Waste (non-hazardous)

Supply Chain Management

Water Stress

Environment - Other Concerns

SOCIAL

Community

Strengths

Community Engagement

Concerns

Impact on Local Communities

Human Rights

Strengths

Indigenous Peoples Relations

Human Rights Policies & Initiatives

Concerns

Civil Liberties

Human Rights Concerns

Human Rights - Other Concerns

Employee Relations

Strengths

Union Relations

Cash Profit Sharing

Involvement

Health & Safety

Supply Chain Labour Standards

Human Capital Development

Labour Management

Stakeholder Opposition - Controversial Sourcing

Human Capital - Other Strengths

Concerns

Collective Bargaining & Unions

Health & Safety

Supply Chain Labour Standards

Child Labor

Labor Management Relations

Labor Rights & Supply Chain - Other Concerns

Diversity

Strengths

Representation

Board Diversity - Gender

Concerns

Discrimination & Workforce Diversity

Board Diversity – Gender

Product

Strengths

Product Safety & Quality

Social Opportunities-Access to Healthcare

Social Opportunities-Access to Finance

Social Opportunities-Access to Communications

Social Opportunities-Opportunities in Nutrition & Health

Product Safety - Chemical Safety

Product Safety -Financial Product Safety

Product Safety - Privacy & Data Security

Product Safety - Responsible Investment

Product Safety - Insuring Health & Demographic Risk

Concerns

Product Safety & Quality

Marketing & Advertising

Anticompetitive Practices

Customer Relations

Privacy & Data Security

Customers - Other Concerns

GOVERNANCE

Strengths

Corruption & Instability

Financial System Risk

Concerns

Governance Structures

Controversial Investments Bribery & Fraud

Governance - Other Concerns

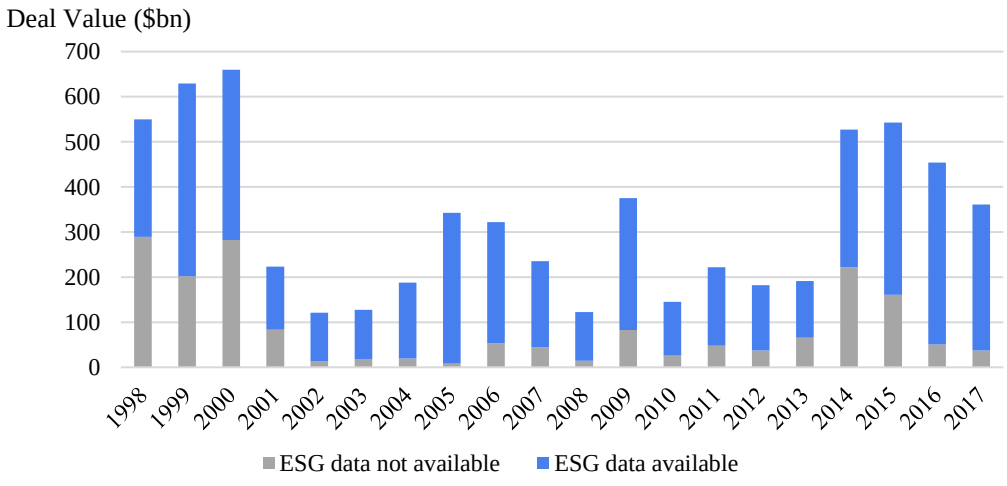
Appendix D – Tables and Charts

Appendix D.1

Year	No. deals	Deal value ($bn)	Avg deal value ($mil)
1998	113	260.38	2,304.24
1999	165	427.64	2,591.74
2000	131	378.20	2,887.02
2001	85	140.07	1,647.86
2002	110	107.42	976.58
2003	117	109.97	939.93
2004	242	168.54	696.44
2005	277	333.74	1,204.85
2006	203	268.72	1,323.73
2007	226	191.15	845.79
2008	144	107.88	749.17
2009	138	292.06	2,116.39
2010	157	119.71	762.51
2011	153	173.86	1,136.33
2012	165	144.75	877.30
2013	150	125.95	839.69
2014	153	304.96	1,993.20
2015	176	382.32	2,172.28
2016	130	403.82	3,106.30
2017	107	323.61	3,024.35
Total	**3142**	**4,764.75**	**1,516.47**

Appendix D.2

Portion of deals with acquirer ESG data available



Appendix D.3

Acquirer Industry

Year	Consumer Products	Consumer Staples	Energy and Power	Healthcare	High Technology	Industrials	Materials	Media and Entertainment	Real Estate	Retail	Telecommunications	Total
1998	9	4	11	16	25	14	8	9	1	7	9	113
1999	5	12	16	14	46	23	13	11	1	4	20	165
2000		13	13	9	45	15	13	5	3	2	13	131
2001	3	4	13	10	28	8	6	4	2	1	6	85
2002	7	9	10	18	37	8	4	5	2	4	6	110
2003	6	5	7	26	32	10	5	9	5	6	6	117
2004	21	10	16	41	70	24	11	13	15	7	14	242
2005	16	11	17	42	89	31	17	13	13	13	15	277
2006	14	8	13	32	55	23	7	13	14	8	16	203
2007	18	11	15	48	59	30	17	4	5	7	12	226
2008	5	4	13	24	49	18	10	7	1	8	5	144
2009	13	9	12	22	40	17	5	7	2	2	9	138
2010	11	9	15	31	45	22	9	6	4	2	3	157
2011	6	8	17	26	29	27	15	10	7	4	4	153
2012	19	4	12	30	32	32	8	11	8	5	4	165
2013	14	9	5	30	35	19	9	10	11	5	3	150
2014	9	13	12	21	37	24	15	7	7	6	2	153
2015	22	6	14	25	37	28	17	8	7	7	5	176
2016	6	9	15	29	31	14	10	4	7	2	3	130
2017	9	8	11	14	15	24	9	7	2	7	1	107
Total	**213**	**166**	**257**	**508**	**836**	**411**	**208**	**163**	**117**	**107**	**156**	**3142**

Target Industry

Year	Consumer Products	Consumer Staples	Energy and Power	Healthcare	High Technology	Industrials	Materials	Media and Entertainment	Real Estate	Retail	Telecommunications	Total
1998	6	5	12	17	24	10	9	7	1	7	15	113
1999	8	9	18	16	41	25	12	11		6	19	165
2000	7	15	13	7	46	13	10	6		3	11	131
2001	6	3	12	11	31	8	7	4		1	2	85
2002	5	9	11	15	41	7	5	5	1	5	6	110
2003	9	6	5	27	36	10		6	5	7	6	117
2004	20	9	16	44	75	19	13	16	12	9	9	242
2005	31	10	17	35	97	30	13	11	14	9	10	277
2006	6	10	13	34	58	20	10	17	11	7	17	203
2007	16	9	18	44	71	26	16	5	5	5	11	226
2008	10	4	12	21	53	17	8	3	1	8	7	144
2009	14	9	12	21	43	12	5	7	2	2	11	138
2010	14	9	15	24	55	16	6	6	5	3	4	157
2011	7	9	16	32	30	18	15	11	3	4	8	153
2012	19	6	11	31	38	24	13	8	5	3	7	165
2013	12	8	4	31	36	16	12	8	11	8	4	150
2014	10	13	13	25	39	18	14	7	8	5	1	153
2015	17	6	13	26	53	22	13	7	3	6	10	176
2016	5	5	14	29	35	10	12	8	6	3	3	130
2017	8	8	7	17	20	20	10	4	3	7	3	107
Total	**230**	**162**	**252**	**507**	**922**	**341**	**203**	**157**	**96**	**108**	**164**	**3142**

Appendix D.4

Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12
1	Listed target	1											
2	All-cash deal	0.140	1										
3	All-stock deal	0.121	-0.308	1									
4	Stock deal	0.154	-0.561	0.549	1								
5	Log (Acquirer size)	0.264	0.093	0.141	0.010	1							
6	Relative size	0.118	-0.121	0.058	0.207	-0.223	1						
7	Stock issue	-0.028	-0.043	-0.051	0.016	-0.010	0.066	1					
8	Cross-border	-0.072	0.040	-0.086	-0.157	-0.005	-0.087	-0.017	1				
9	Industry relatedness	0.054	-0.063	0.013	0.086	0.026	0.043	-0.005	-0.025	1			
10	Hostile	0.078	0.003	0.024	0.013	0.039	0.011	-0.012	0.047	0.014	1		
11	Competing bidders	0.159	0.040	-0.020	0.020	0.048	0.032	-0.014	0.041	0.032	0.098	1	
12	ESG score	-0.003	0.045	-0.088	-0.060	0.086	0.001	0.064	0.003	0.026	-0.048	-0.024	1

Department of Business and Management

Chair of Advanced Corporate Finance

Does ESG affect shareholder value creation? Evidence from the M&A market

(Summary)

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Introduction

Corporate takeovers are one of the most significant events in the life of a firm and represent the largest and the most readily observable form of corporate investment. Not surprisingly, it is a major area of study in corporate finance, and much of the current literature has attempted to identify the variables that influence the performance of mergers and acquisitions (M&A). This paper investigates the impact of these variables on a large sample of M&A deals, with a focus on the relationship between a firm's social commitment and its M&A performance, which in turn affect value creation for its shareholders.

Whether a firm should engage in socially responsible activities that deviate from the profit maximisation is a question deeply rooted in economic theory. According to the traditional *shareholder theory*, social welfare is maximised when each firm maximises its profit. In sharp contrast, *stakeholder theory* argues that managers should take account of the interests of all stakeholders in a firm, including not only financial claimants but all those who are affected by the decisions made by the firm. This long-lasting debate has been getting renewed interest in the last years as the attention to Environmental, Social and Governance (ESG) factors in investment and M&A decisions has continuously increased. ESG criteria are a set of standards aiming at assessing firms' performance with regard to these three broad categories. By looking at these measures is possible to gauge a company's social commitment and assess its Corporate Social Responsibility (CSR) behaviour towards these dimensions. Corporate social responsibility can be defined as the set of a company's practices and voluntary initiatives that helps it to be socially accountable and define its relationship with its stakeholders and the surrounding environment. Despite being not compulsory, many firms have raised their investment in ESG either voluntarily or as a result of pressure from activist investors and detail their social activities in their annual reports. Given the growing interest around this topic, the recent literature has tried to find a relationship between social performance and financial performance, at the same time practitioners are increasingly incorporating non-financial factors in their investment decisions. In the context of M&A, a growing importance given to *ESG due diligence*. Deal makers are increasingly integrating ESG factors into their due diligence process in order to uncover hidden risks and adjust the valuation and the deal's terms accordingly. ESG performance represents a significant lever in price negotiation when is critical to have a comprehensive view of all relevant risks and opportunities; it can also have a significant impact on valuation in terms of cost-saving associated to energy efficiency, reputation, employee engagement or customer loyalty. The focus on ESG in due diligence process has increase over the past years and the trend is set to continue in the future as the issues related to it become more material in the context of corporate transactions.

This paper joins the ongoing debate about the merits of ESG, with the purpose of better investigate the relationship between social performance and shareholder value creation in corporate takeovers. Its purpose is twofold. First, it is proposed to assess whether acquirers that are more socially responsible

engage in M&A transactions that generate more value for their shareholders. Second, it examines the effect of ESG similarity between acquirer and target on shareholder value creation, to determine whether a higher degree of similarity leads to more successful and synergistic deals. To answer these questions, an empirical analysis is conducted following the contributions of previous studies from Deng, Kang and Low (2013) and Bereskin et al. (2018), which are among the firsts who analysed the impact of corporate sustainability on mergers. The present paper differentiates from them by focusing exclusively on short term returns, at the same time it expands the scope of research by analysing not only on mergers but also acquisitions and using a more recent sample of deals.

More specifically, a sample of 3,142 M&A deals between 1998 and 2017 have been analysed using an event study approach and the estimation of multivariate regression models. First, the selected sample is divided into two subsamples of low and high ESG acquirers, the classification is based on the full sample mean of the *ESG Score*, a variable described later in the text. Then, an event study is applied to test the difference in the acquirers Cumulative Average Abnormal Returns (CAARs) between the two subsamples. The results show that high ESG acquirers realise on average positive and significant announcement returns vis-à-vis non-significant CAAR for low ESG acquirers, with the difference between the two subsamples being positive and significant. Second, the impact of a firm's social performance on M&A value creation is further investigated using multivariate regression models. In this analysis, the acquirers' Cumulative Abnormal Returns (CARs) are regressed on their ESG Score and *ESG Similarity*, respectively, also including some deal-specific characteristics. The results show that as regards to M&A value creation, the degree of ESG similarity between the acquirer and the target is a potential driver of performance.

Literature review

The purpose of this section is to provide an overview of the empirical evidence regarding the impact of ESG (and more in general of social responsibility) on shareholder value creation in M&As. Deng, Kang, and Low (2013) are among the first to study the impact of corporate social responsibility on shareholders returns. Using the KLD STATS database, one of the largest providers of ESG scores, they investigate a sample of 1,556 successful US mergers between 1992 and 2007. They first perform a univariate test by dividing the deals into two subsamples, and find that the average acquirer CAR (-1, +1) is higher and statistically significant for bidders with higher CSR score. However, the difference between the means is not statistically significant for CARs estimated over larger windows, i.e. (-2, +2) and (-5, +5). Besides, in a multivariate test, the CSR measure (proxied by ESG scores) has a positive and significant impact on acquirer CAR, even after controlling for a number of deal-specific characteristics. The empirical results suggest that firms that integrate stakeholders' interests in their activities and thus have higher ESG score engage in M&A activities that ultimately benefit shareholder wealth and corporate value. Besides, they find that high CSR acquirers realise higher stock returns also

in the long-term, suggesting that the market does not fully recognise the benefits of CSR immediately. By contrast, Yen and André (2018) did not find a statistically significant association between CSR and acquirer CARs and argue that the effects of CSR performance on shareholder wealth depend primarily on the cost-benefit concerns of investors. However, they focus merely on emerging market countries, and the sample may be not representative of the entire M&A market. Additionally, Arouria, Gomesb, Pukthuanthongc (2019) find that deals conducted by acquirers with strong CSR are associated with lower deal completion uncertainty, as revealed by narrower arbitrage spreads following initial acquisition announcements. The proposed explanation is that when the attempt comes from a socially responsible bidder, target firms' stakeholders are less likely to oppose the acquisition because of the potential increased reputation of the combined entity.

Some scholars analyse not only the CSR performance of the acquirer but also its closeness with the target firm. Bereskin et al. (2018) conduct research on 570 completed US mergers from 1994 to 2004 and find that firms with similar cultures (proxied by CSR) are more likely to merge, experience smoother post-deal integration and realise higher synergies. Specifically, the differences in the mean and median combined CARs of the high-similarity (top 25th percentile) and low-similarity (bottom 25th percentile) groups are 3.5% and 3.1%, respectively, and both of these differences are statistically significant at the 1% level. The CSR similarity variable is constructed matching ESG scores of acquirer and target over several subcategories. Consistently, Alexandridis et al. (2018) observe that the "corporate cultural divergence" – a variable built using data on ESG – between the acquiring and the target firm is associated with lower acquirer announcement and long-run returns.

Other researchers shift the attention from the abnormal returns to the acquisition premium. Target's ESG performance is positively valued by the bidder, and it is thus related to higher bid premiums (Cremona and Passador, 2019; Gomes and Marsat, 2018), parallelly acquiring firms with high ESG scores pay lower premiums to target firms Krishnamurti et al. (2019). Some explanations are that socially-oriented firms engage better with stakeholders, have greater transparency and disclosure and are therefore less prone to value-destroying acquisition driven by managerial self-interest.

Methodology

This section provides an explanation of the two methodologies used to test the research hypotheses: the event study and the multivariate regression analysis. Event studies are widely used by researchers to analyse the market reaction to firm-specific events, like in the case of M&A announcements. These events bring new information to the market and, if the stock market is efficient, investors' expectations about this new information are immediately and fully reflected in share prices. Therefore, all the value created by the M&A transaction is captured by the abnormal return in a short event window surrounding the announcement date. Announcements will be accompanied by positive returns if the acquisition is

value-creative and by negative returns if the acquisition is value-destroying. This approach relies on the efficient market hypothesis (EMH) and assumes investors rationality. Also, the announcement effect reflects accurately the value created by the deal only if the bid is not anticipated and not contaminated with other information regarding the stand-alone value of the firms involved.

The abnormal return is given by the difference between the actual return and the normal return that would be expected if the event did not take place and represents the unexpected change in security holder wealth related to the event:

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

Where: $AR_{i,t}$ is the abnormal return for the security i at the time period t, $R_{i,t}$ is the actual/observed return, $E(R_{i,t})$ is the expected/normal return. In this study, the expected returns required to measure the abnormal returns are estimated using both the market model and the three-factor model, with slightly different outcomes. The respective formulas are reported below:

Market Model: $AR_{i,t} = R_{i,t} - [R_f + \alpha_i + \beta_i(R_{m,t} - R_f)]$

Three-factor Model: $AR_{i,t} = R_{i,t} - [(R_f + \alpha_i + \beta_i(R_{m,t} - R_f) + \beta_i^{SMB}(R_{SMB,t}) + \beta_i^{HML}(R_{HML,t})]$

The estimation period over which the parameters of the models are estimated is [-200, -20], and the event window is set at [-1, +1], all day notation is relative to the event date (day 0). The day preceding the announcement is included to capture price movements resulting from information leakages, while including a trading day following the announcement allows accounting for any delays in the stock price reaction. As a robustness test, longer and different event windows also examined.

Once the abnormal returns are calculated, they are aggregated through time for any security. Since the returns calculated are continuously compounded: $R_{i,t} = ln(P_{i,t} / P_{i,t-1})$, the cumulative abnormal return (CAR) is given by adding up the 1-day abnormal returns:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{it}$$

Where t_1 *and* t_2 are the beginning end the end of the event window, respectively – e.g. $CAR_i(-1, 1)$ is the cumulative abnormal return of firm i in the period of time from one day before the announcement to one day following the announcement. 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:

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

Where N is the number of securities included in the sample. The significance of CAAR can be assessed by using an ordinary cross-sectional t-test, where the null hypothesis is that the average of the CARs is not different from zero – i.e., $H_0: CAAR = 0$. The test for difference between means, for large and

independent samples, is given by the following test statistic, which follows a normal distribution under the null hypothesis:

$$Z_0 = \frac{(CAAR_A - CAAR_B)}{\sqrt{\sigma_A^2/N_A + \sigma_B^2/N_B}} \sim N(0,1)$$

Where $\hat{\sigma}_A^2$, $\hat{\sigma}_B^2$ and N_A , N_B are the variance and the number of observations included in the two samples.

In the second analysis, to better investigate the impact of social performance on M&A value creation and to disentangle its impact from other value drivers, a multivariate regression analysis is performed. The acquirers' Cumulative Abnormal Returns (CARs) are used as dependent variable and are regressed on their *ESG Score* and *ESG Similarity* variables, several firm- and deal-specific characteristics are also included in the models to avoid any bias:

ESG Score Model: $$CAR(-1,1)_i = \beta_0 + \beta_1(Listed\ Target)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4(Private\ target)_i * (Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_7(Listed\ target)_i * (Relative\ size)_i + \beta_8(ESG\ score)_i$$

ESG Similarity Model: $$CAR(0,2)_i = \beta_0 + \beta_1(ESG\ Similarity)_i + \beta_2(All\ cash\ deal)_i + \beta_3(Stock\ deal)_i + \beta_4 Log(Acquirer\ size)_i + \beta_5(Relative\ size)_i + \beta_7(Industry\ relatedness)_i$$

The coefficients are estimated using Ordinary Least Squares (OLS) with heteroskedastic and autocorrelation consistent (HAC) standard errors. Once the coefficients are obtained, a two-tailed test for significance is conducted for each individual variable to assess whether it has a statistically significant impact or not.

Data and variables definition

The sample of mergers and acquisitions was collected from Thomson Reuters Securities Data Corporation (SDC) Platinum database. The initial sample include all completed transactions involving US acquirers announced between 1998 and 2017 that satisfy the following criteria:

i. The acquirer is publicly listed
ii. The deal value is at least $10 million
iii. Transactions labelled as acquisitions of minority interest, acquisitions of remaining interest, recapitalisations, exchange offers or repurchases are excluded.
iv. The percentage of target common shares outstanding held by the acquirer at the announcement date is less than 50%, it seeks to own more than 50%, and own more than 50% after the deal completion.
v. Both the target and the acquiring firm do not operate in the financial sector or in the public sector.
vi. Those acquisitions where the percentage of common shares outstanding acquired is less than 20% are also excluded.

Additionally, stock return data must be available for the acquirer firm in the Center for Research in Security Prices (CRSP) database and acquirer firm characteristics must be available in the Compustat database. This initial screening through SDC identifies 5,852 transactions. Then the sample was further refined to include only those deal whose acquirer is in the KLD database which contains data on ESG. The final sample results in 3,142 transactions with an aggregate deal value of $4,765bn, resulting in average deal value of roughly $1.5bn. The majority of deals (48%) have been completed using a mixed form of payment, the fraction of all-cash deals is 39%, and the remaining 13% are all-stock deals, this latter form of payment is more frequent in the first half of the sample period. Regarding the listing status of the target, the transactions are almost equally split between those involving the acquisition of a listed target (47.2%) and those involving the acquisition of a private target (52.8%). A significant fraction of transactions consists of cross-border acquisitions (21%), while those involving competing bidders or defined as "hostile" by the target board are only 2.5% and 0.5% respectively, 73.7% of the transactions are classified as related acquisitions.

The data to measure a firm's social performance are obtained from the MSCI ESG KLD STATS (KLD) database, an annual data set of positive and negative environmental, social, and governance (ESG) performance indicators applied to a universe of publicly traded companies. Each annual KLD data set contains a set of indicators assessing positive and negative ESG performance grouped in the three major dimensions: *Environment*, *Social* (broken down in five subcategories: community, human rights, employee relations, diversity, product), *Governance*. Each of these dimensions comprises several positive or negative indicators referred to as *strengths* and *concerns*, respectively. The ESG performance indicators are assessed by a binary scoring model that facilitates a quantitative analysis: "1" if a company meets the assessment criteria established for an indicator, "0" if a company does not meet the assessment criteria established for an indicator. These data are used to construct two variables: one measure the overall ESG score of a company and the other the ESG similarity between acquirer and target.

The *ESG Score* of a company is given by the arithmetic average of its three dimensions: Environment (E), Social (S), Governance(G) and is bounded between [-1, 1]

$$ESG\ Score_t = \frac{1}{3}\sum_{i=1}^{3} dimension\_ESG_t^i$$

$$dimesion\_ESG_t^i = \frac{\sum_{s=1}^{u_t^i} strength_s^i}{u_t^i} - \frac{\sum_{c=1}^{k_t^i} concern_c^i}{k_t^i}$$

Where: $strength_s^i$ is an indicator equal to 1 if the firm meets strength s,i and 0 otherwise; u_t^i is the total number of strengths for dimension i, year t; $concern_c^i$ is an indicator equal to 1 if the firm meets concern c, i and 0 otherwise; k_t^i is the total number of concerns for dimension i, year t.

The *ESG Similarity* is calculated as a distance by computing the dot product of two vectors divided by the product of their length. Given two firms α and β, the ESG similarity between the two is given by:

$$ESG\ Similarity_{\alpha\beta,t} = \frac{\sum_{i=1}^{n} \alpha_{i,t}\beta_{i,t}}{\sqrt{\sum_{i=1}^{n} \alpha_{it}^2}\sqrt{\sum_{i=1}^{n} \beta_{it}^2}} = \frac{\boldsymbol{X}_{\alpha,t} \cdot \boldsymbol{X'}_{\beta,t}}{\sqrt{\boldsymbol{X}_{\alpha,t} \cdot \boldsymbol{X'}_{\alpha,t}} \cdot \sqrt{\boldsymbol{X}_{\beta,t} \cdot \boldsymbol{X'}_{\beta,t}}}$$

Where the vectors $\boldsymbol{X}_{\alpha,t}$ and $\boldsymbol{X}_{\beta,t}$ correspond to firm $\alpha's$ and firm $\beta's$ ESG scores in each indicator. The value of this variable is bounded between [0, 1], with a value of 1 indicating a perfect match between all strengths and all concerns of two the firms and a value of 0 indicating no match between the two ESG profiles.

Results

This section provides an analysis of the acquirer M&A announcement returns and investigates the impact of the ESG performance in shareholder value creation. The first analysis is proposed to assess whether acquirers that are more socially responsible engage in M&A transactions that generate more value for their shareholders. To test this hypothesis, the selected sample is divided into two subsamples of low and high ESG acquirers, depending on whether they have an *ESG Score* above or below the full sample mean. The Cumulative Average Abnormal Returns (CAARs) for the acquiring firms are then estimated for the full sample of acquirers as well as for the two subsamples of high and low ESG acquirers, for five different event windows and using both the market model and the three-factor model as normal return benchmark. The results show that CAARs for high ESG acquirers are positive and significant, while CAARs of low ESG acquirers are not significantly different from zero. The test of difference reveals that the equality of CAARs between high and low ESG firms is rejected at 5% level for CAAR (-2, 2) and CAAR (-5, 5) and at 10% level for the other event windows, irrespective of the of the model employed to estimate the normal returns. A potential explanation is that firms that are more socially responsible are less driven by managerial self-interest and tend to engage in acquisitions that are more value-creative for their shareholders. These firms often have a better reputation for keeping their commitments and are more likely to satisfy target's stakeholders, characteristics that facilitate the post-closing integration process.

In the second analysis, the impact of a firm's social performance on M&A value creation is further investigated using multivariate regression models. The estimated output suggests that acquirer's social performance has a limited impact on shareholder value creation, as indicated by the positive (0,737) but not statistically significant coefficient of *ESG Score*. The contradiction with previous test may be due to the fact that a firm's social performance is correlated with other variables, and, when controlling for this effect, its impact is no longer significant. It also indicates that further research is still needed. Conversely, the degree of ESG similarity between the bidding firm and target firm has a positive (2,67%) and significant (5% significance level) impact on the value created for acquiring shareholders.

This result indicates that investors expect the realisation of greater synergies between firms that share the same corporate culture and social commitment (proxied by the *ESG Similarity* variable) and react positively when these deals are announced. The cultural fit is often regarded as a crucial factor for successful post-closing integration thus the acquisition of firms with ESG policies close to the bidder is perceived to be value-creating.

Finally, an analysis of the bidding premium shows that a higher level of ESG similarity is associated with a lower acquisition premium as indicated by the negative and significant coefficient of *ESG Similarity*. This finding is consistent with the expectation that the similarity between ESG profiles creates value for acquiring shareholders through the M&A process: target's management is less incentivised to negotiate the acquisition price if it believes that post-closing integration will be easier and that its stakeholders will benefit more.

Conclusions

This paper has investigated the relationship between social performance and shareholders value creation in M&A deals. In recent years corporate sustainability has been getting renewed attention with a focus on Environmental, Social and Governance (ESG) factors. Despite the growing interest among practitioners and researchers, the impact of social performance on financial performance is still subject to much debate, and empirical evidence is still scarce. This paper joins the existing literature with the aim of clarifying the implications of ESG in corporate takeovers, for this purpose a sample of 3,142 M&A deal completed by US acquirers between 1998 and 2017 has been selected and studied. Two different methodologies have been applied to test the research hypotheses: event study and multivariate OLS regression. The first research hypothesis is that firms with higher ESG score engage in acquisitions that are more value-creative. The explanation is that firms that are considered more socially responsible are less driven by managerial self-interest; they also have a better reputation for keeping their commitments which encourage the target to accept less favourable explicit contracts. Supporting this view, the event study analysis suggests that acquirers with higher ESG score realise M&A transactions that generate more value for their shareholders. However, these findings are not supported by the regression analysis; thus, it cannot be ruled out that this effect is actually caused by other deal-specific characteristics. The attention then shifts to the level of social performance similarity between the acquirer and the target, the pairwise closeness of any two firms' ESG profiles are calculated in this regard. Post-closing integration is a crucial factor for successful M&A, if two firms share the same corporate culture and social commitment, the integration is likely to occur smoothly, and the expected synergies are easier to materialise. Therefore, the expectation is that the level of social performance closeness should have a positive impact on the value created for the shareholders. The results support this hypothesis by showing a positive and significant impact of ESG similarity on bidder's abnormal returns. Consistently, the acquisition premium offered by the bidder is negatively related to the degree

of similarity, meaning that the target's management may be less incentivised to negotiate the acquisition price if it believes that post-closing integration will be easier and that its stakeholders will benefit more. Overall, the results support the stakeholder theory suggesting that social performance is a significant determinant of M&A performance. In particular what seem to contribute to shareholders value creation in M&A transactions is the degree of ESG similarity between the acquirer and the target, rather than the overall ESG performance on a stand-alone basis.