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Impact of the CEO Age and CSR Score on Mergers and Acquisitions

by

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Keywords:	Corporate Social Responsibility (CSR), Merger and Acquisitions (M&A), Cumulative Abnormal Returns (CAR), Short-term M&A performance, Management characteristics and CEO age
Purpose:	This study aims to shed light into the research gap identified in the M&A literature. This paper investigates how the combination of the acquiring firm characteristics and the individual CEO characteristics can impact the performance of the M&As. Besides, this study explores how the target's individual and firm characteristics impact the investors' reaction.
Methodology:	The method adopted was the Event Study through the Market Model approach. We calculated the cumulative abnormal returns of the firm from two days before to two days after the announcement day. The Estimation Window is from eleven to two hundred trading days before the event. Besides, we also used the ordinary least squares (OLS) for multiple regression when analysing the main hypotheses.
Theoretical perspectives:	The theoretical perspective combines the theory from the performance of M&As with the CSR theories and studies over the age of the CEO.
Empirical foundation:	M&As of European companies from 01.01.2008 to 31.12.2018 involving the ESG scores and the CEO age of the acquiring and the target companies.
Conclusions:	The CSR score and CEO age of the acquiring company impact the M&A performance both individually and combined. The target company's CSR score and CEO age do not influence the market's reaction in the event of the announcement of the M&A.

Abstract

This study intends to combine both the management characteristics and firm's characteristics to analyse the M&A performance. For the management characteristics, we used the CEO age and for the firm characteristics, we used the CSR score. In order to understand the M&A performance, we conducted an Event Study to predict the abnormal stock returns of the acquiring firm around the announcement of the M&A. The sample consists of European M&As from 2008 to 2018. The study extends not only to the acquirer's but also to the target's perspective. The findings for the acquiring company suggest that the M&A performance has a relationship with the CEO age and CSR score both individually and combined. More particularly, M&As have higher performance when the CEO of the acquiring company is old and the CSR score of the acquiring company is high. Finally, our empirical evidence suggests that the market is not concerned about the target characteristics.

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List of Abbreviations

CAR - Cumulative Abnormal Returns

CAPM - Capital Asset Pricing Model

CSR - Corporate Social Responsibility

M&A - Mergers and Acquisitions

OLS - Ordinary Least Squares

SRI - Sustainability Responsible Investments

GDP - Gross Domestic Product

CLM - Classical Linear Model

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1. Introduction

The purpose of this Chapter is to increase the reader's understanding of the background of the study. The aim, research question and limitations are discussed.

1.1 Background

Global merger and acquisitions (M&A) market have seen a rapid increase reaching the $ 3.7 trillion in announced volumes by 2017 (JP Morgan, 2018). The reason for this trend is twofold. First, the M&As are expected to secure a rapid growth for the organization and second to create synergies that increase the value of the organization. Much of the current literature has attempted to identify the inputs that can impact the performance of M&As[1] (Hazelkorn et al., 2004, Masulis et al., 2007, Aktas et al., 2011). Previous studies, however, suffer from different results and this leads to confusion on which are the inputs that drive the performance of an M&A.

Few recent studies attempt to address the performance of M&As based on the CSR score, bringing different empirical results to the academic studies[2]. Investor decisions and expectations are not merely based on CSR. Nevertheless, the investors consider CSR as a part of the management characteristics since sustainability relies on the managers' decisions. Investors are aware of the existent pressure on firms to propagate a responsible and sustainable image that sometimes does not reflect reality. Moreover, M&A studies mainly focus on the firm's characteristics, such as CSR, rather than individual characteristics, such as the demographics of the CEOs. This fact is problematic since CSR is related to the management's decisions and, thus, driven by their characteristics. A question then arises regarding whether it is appropriate to study the CSR score alone as one of the performance drivers of M&As.

Additionally, it is debated which individual CEO characteristics can be combined with the CSR score and result in a successful definition of M&A. Some relevant demographic characteristics of a CEO are age, gender, tenure, educational level and educational specialization (Huang, 2013). From these, age is considered the most important characteristic that impacts the CEO's corporate risk-taking behaviour. Disregarding gender or education, people of the same generation have some common characteristics that distinguish them from other generations

[1] By the term, "M&A performance", the authors mean the positive reaction of the stock price of the acquirers after the announcement day of the M&A

[2] For studies that examine the performance of M&As through CSR score, see, for example, Aktas et al. (2011), Deng et al. (2013), Bereskin et al. (2018)

(Business Insider, 2018). For example, the Millennials are stigmatized as the generation with the highest impact from the media (Geraci & Nagy, 2004) and the Baby Boomers as the generation that had to recover from the disasters of the World Wars (Doepke et al., 2015). Thus, the age of the people can be described as an umbrella term that influences all other characteristics and risk-taking behaviour of a CEO.

Clearly, there is a gap in the researches when exploring the interactions between the firm's sustainability image and its management characteristics. This study takes on a new approach and combines both the acquiring firm's characteristics through CSR score and the individual characteristics through the CEO age.

1.2 Aim and Research Purpose

Limited studies have analysed the impact of sustainability on the M&As and only one paper has focused on the relationship between the CEO age and M&As (Yim, 2013). To the extent of our knowledge, there is no research combining both the CEO age and CSR score for the performance of M&As. Therefore, this paper aims to explore how the combination of management characteristics with sustainability impacts the performance of M&As. In addition to the main question, other valuable results can be achieved by analysing whether the acquirer and target characteristics combined can affect the performance of the M&A.

The research topic is relevant since it contributes to the academic study of M&As by linking two important aspects, sustainability and the age of the CEO. These authors have not found evidence that these two aspects have been analysed together previously. This topic is interesting since the high amount of money spent on M&A deals encourages researchers to understand and even predict the share price oscillations around the event day. Although the CEO age is readily observable, there is surprisingly little evidence on how the age affects the CEO's corporate risk-taking behaviour. During this study, the authors intend to answer the three main questions about the interaction of the CSR, management characteristics and M&A:

Can the CSR score and the CEO age of the acquiring company affect the performance of the M&A?

Can the CEO age of the target and acquiring company affect the performance of the M&A?

Can the CEO age of the acquiring company together with the target CSR score affect the performance of the M&A?

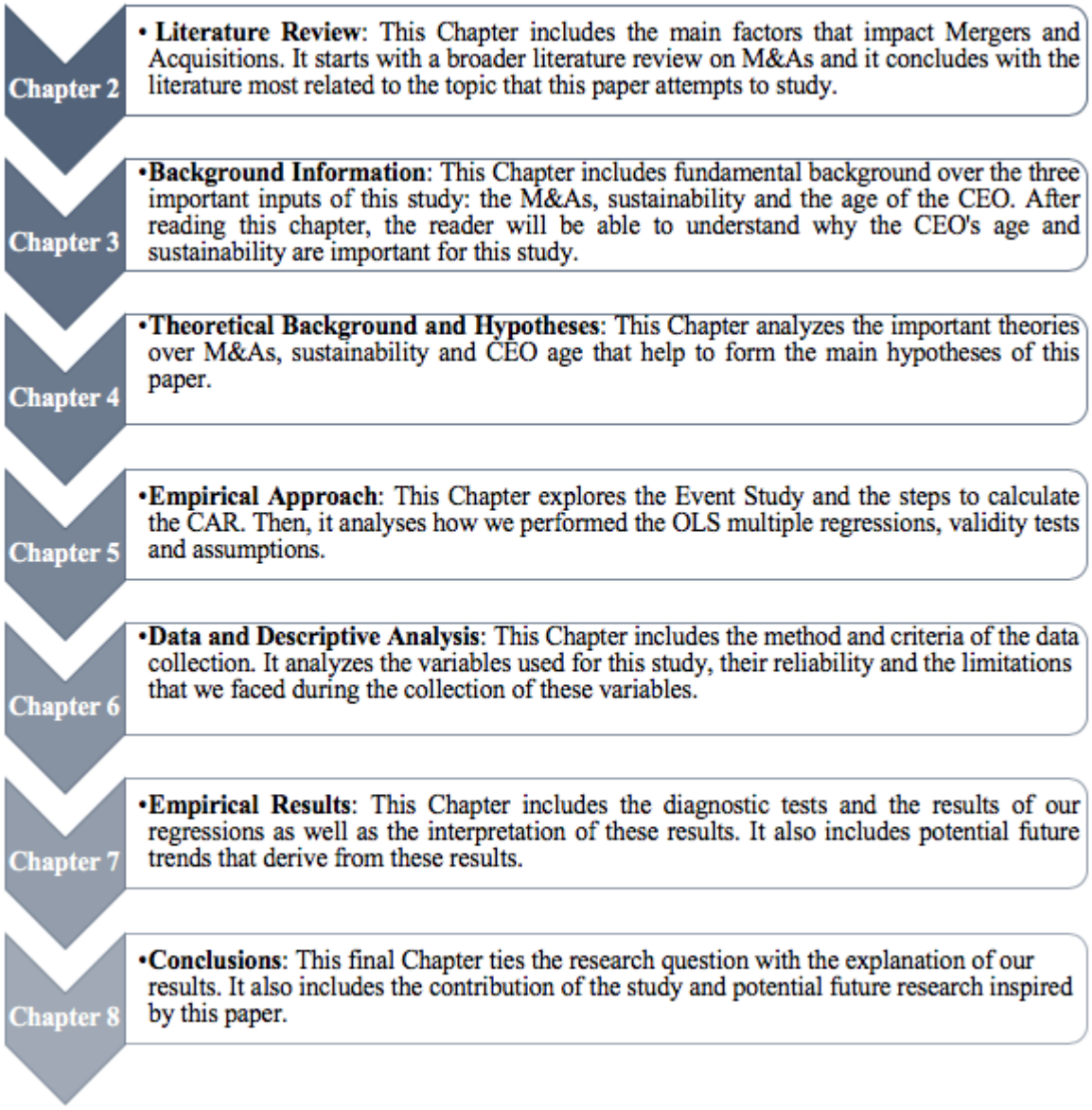
Within these questions, the study intends to understand the relation of management characteristics and CSR together when analysing the M&A performance, both in the acquirer's and target's perspective. The findings of this research suggest that the ideal CSR score for the performance of a merger can only be defined when we know the age of the CEO as well. The shareholders will invest in a company with an older CEO even if it has a lower CSR score since they trust the CEO experience, status and business instincts. Furthermore, this study also suggests that the shareholders are not concerned about the target characteristics. The market believes that the acquiring company's individual and firm characteristics are enough to predict the performance of M&As.

1.4 Delimitations

This study concerns the period of the European crisis and this might have an impact on the M&A deals conducted throughout this period as well. Nevertheless, the sample refers to a period of ten years which is long enough to offset the results from the crisis shock. Also, this period can give valuable results for future studies that also analyse periods under the economic crisis.

In order to analyse the research questions, an Event Study is conducted following previous researches that have studied a similar topic (Aktas et al., 2011, Deng et al., 2013, Bereskin et al., 2018). However, this method relies on the Efficient Market Hypothesis (Fama, 1970), assuming that the stock price incorporates the market expectation regarding the event.

1.5 Outline of the Thesis



2. Literature Review

The purpose of this Chapter is to analyse the main empirical papers with the factors that impact the performance of M&As. It starts with a broader literature review on M&As and it concludes with the literature most related to the topic that we study.

2.1 Literature on M&As

Studies into Mergers and Acquisitions have a long history and many researchers attempted to analyse the factors that result in a better performance of the M&As. However, the performance of the M&As is not simple to define and it can be analysed in different perspectives. There are two main categories of M&As performance and these are the short-term and the long-term performance. In the case of the short-term performance, studies define the performance in terms of the market's reactions for the stock returns. In this case, the object of study or, in other words, the dependent variable can be the abnormal stock returns around the event day (Aktas et al., 2011; Deng et al., 2013). The previous researches have studied different explanatory variables that can impact the abnormal stock returns. For example, Hazelkorn et al. (2004) studied the US M&As from 1990 to 2002 and published a roadmap with the most important factors that affect the performance of M&As. They argued that short-term success is affected by whether the target and the acquirer have similar size, operate in the same country and have similar EBITDA margins.

On the other hand, some may argue that the short-term view is not appropriate by itself since the post-merger and integration plan are important aspects of the M&A performance. This is seen as the long-term approach to M&A performance. For this reason, some researchers used operating performance as the dependent variable. For example, Deng et al. (2013) attempted to compare the operational performance of the merged firms with non-merged firms. Yet, another used approach considers that the acquirer creates value when his/her operations outperform the competitors (Hazelkorn et al., 2004). There is a variety of explanatory variables that can influence M&A performance. The post-integration depends on differences between the acquirer and the target company, avoiding cultural clashes and psychological issues of both parts (Larsson & Finkelstein, 1999). For this reason, long-term success can change if the target and the acquirer operate in the same industry or the same country (Hazelkorn et al., 2004). Furthermore, the management has an important task in the integration, since it is recommended to have a good capability to solve conflicts or employee resistance. Also, managers should use effective communication during the process (Larsson & Finkelstein, 1999).

Some aspects surely impact both the short-term and long-term in different ways and magnitudes. Both approaches are extensively used in literature to study the M&As depending on the focus of the study. For example, Hazelkorn et al (2004) argued that the method of payment of the deal affects both the short-term and long-term performance of M&As. They refer to the payment method as the acquisition with either equity or cash and stock. Furthermore, the same authors argued that earnings growth can impact both short-term and long-term performance. They implied that the lower earnings growth of the target can result in higher M&A performance. They explained this by arguing that targets with lower earnings growth belong to a mature industry and, hence, the merger can result in higher operating synergies. In contrast, companies with lower earnings growth should not be acquired since they will create more future value if they focus on their own operations. Finally, strict regulations are seen by the investors as an extra barrier that threatens the performance of M&As both in the short-term and in the long-term (Campa & Hernando, 2004).

2.2 Empirical papers on M&As and CSR

Although there is extensive literature for M&As and CSR as separate topics, there is less research for the importance of CSR to the performance of mergers and acquisitions. So far and to the extent of our knowledge, there is no research on the topic of the present study. This section includes existing literature which is considered closely related to this study. The authors conducted a meticulous screening to include only the most important and reliable articles.

Positive relationship between CSR and M&As

Aktas et al. (2011) conducted interesting research on the impact of CSR in M&As. They drew on an extensive range of sources to select 106 completed global mergers from 1997 to 2007. The purpose of their research was to identify whether Sustainability Responsible Investments (SRI) affects the response of M&A investors and had two valuable results. The first one is that the stock market awards the acquirer for investing in socially and environmentally responsible targets. The second is that after the acquisitions of a target with high investment in sustainability, the acquirer's environmental and social performance increases.

Deng et al. (2013) extended on Aktas et al. (2011) research with a bigger sample of 1,556 completed US mergers from 1992 to 2007. In contrast to Aktas et al. (2011) research, they didn't focus on the target's CSR. They examined the two competitive CSR views of the shareholder maximization and shareholder expense view in the short term and long term. They concluded that acquirers with higher CSR realize higher merger returns both in the short-term and long-term. However, they added that the market does not measure the impact of the CSR

immediately, but the higher results are focused on the long-term. Also, they stated that mergers with higher CSR acquirers take less time to complete.

Further to Deng et al (2013) research, Bereskin et al (2018) conducted similar research of 570 completed US mergers from 1994 to 2004. They attempted to find the impact of the cultural fit on the performance of M&As, taking evidence from CSR. They found two valuable results. First, organizations with similar cultures are more likely to merge. Second, mergers with similar cultures have more successful post-integration and higher long-term operating performance.

Negative relationship between CSR and M&As

Meckl and Theuerkorn (2015) took issue with the contention that higher CSR acquirers will have more successful mergers and acquisitions. Nevertheless, their results were different than expected. Using a sample of 113 completed US and German M&As from 2006 to 2010 they found two interesting results. The first one is that high engagement in CSR can be value-destroying for the M&A. The second one is that high environmental engagement implies higher costs during the M&A transactions, and this can lead to failure of the M&A. These results are different from the existing literature since they imply that CSR has a negative impact on the performance of M&As.

One main reason for this negative relationship is the information asymmetry between the managers and the stakeholders (Hahn & Lulfs, 2015). The shareholders cannot assess whether the information is reliable or not and this is an agency problem. If the investors don't consider that the motives behind sustainability are sincere, then they will have a negative reaction (Yoon et al., 2006) as a result of agency problems (Kruger, 2015). Another reason can be that the investment in CSR without value-creation leads to lower performance (Falkenberg & Brunsæ, 2011).

CEO age and M&As

The age of the CEO formed the central focus of a study by Yim (2013) in which the author found that a firm with a CEO who is 20 years younger is 30% more likely to announce an acquisition. His sample was composed of 1500 firms of the S&P 1500 Index from 1992 to 2007. His study gives valuable results about how the agency problem is affected by the CEO age. The same author also published a paradox in his research where he argued that CEOs with longer tenure have a positive impact on the performance of M&As as well. All the above theories are summarized in Appendix A.

3. Background information

This Chapter aims to give to the reader a broader understanding of the three most important aspects of the paper. First, we analyse background information over the M&As. Second, we define sustainability through the pros and cons and the construction of the ESG score. Finally, this Chapter describes the background information over the importance of the CEO age.

3.1 Mergers and Acquisitions

There are two ways of expanding one organization. The first one is through organic growth which is a slower procedure where the company grows through existing operations. It requires less immediate cash and it is a slow and uncertain process. It gives more space to the reaction of the competitors who can create a similar competitive product without violating any patent. Organic growth is also vulnerable to regulatory, economic and technology shocks since it is not feasible to adjust rapidly the company's operations (Gaughan, 2015).

The second one is rapid growth through mergers and acquisitions. These are the most common forms of corporate investment (Masulis et al., 2007). Also, M&As are preferred compared to organic growth especially during the merger waves (Gaughan, 2009). Since 1897, there have been six waves in the M&As market. The sixth and last recorded wave was from 2003 to 2007 (Alexandridis et al., 2012). This study is not influenced by the takeover waves since it refers to the period after the sixth wave and there is not a seventh historic takeover wave recorded so far.

Another advantage of mergers and acquisitions is that they create value through the increased economies of scale, shared distribution channels and combined technology (Arzac, 2007). Therefore, through all these synergies the stock value increases and this increases the company's value as well. The increased company value implies maximization of the shareholders' value.

Mergers and acquisitions are two different transactions that should be defined. In the case of the mergers, the two companies create a new combined firm. The two old companies terminate their existence and only the new company continues to operate (Gaughan, 2015). On the other hand, in the case of acquisitions, the acquired firm still exists as an independent legal entity (Deng et al., 2013). However, its assets and liabilities are consolidated into the group's Financial Statements (Gaughan, 2015).

There are three different types of mergers and acquisitions as described by Hijzen et al. (2008). The *vertical M&A* is the one where the two merged companies have a buyer-supplier relationship and the *horizontal M&A* is the one where two competitors merge. The third is the *conglomerate M&A* where the two companies do not have linkages. Empirical studies have shown that conglomerate mergers have superior gains than non-conglomerate mergers (Elgers & Clark, 1980).

3.2 Sustainability

3.2.1 Definition & Purpose

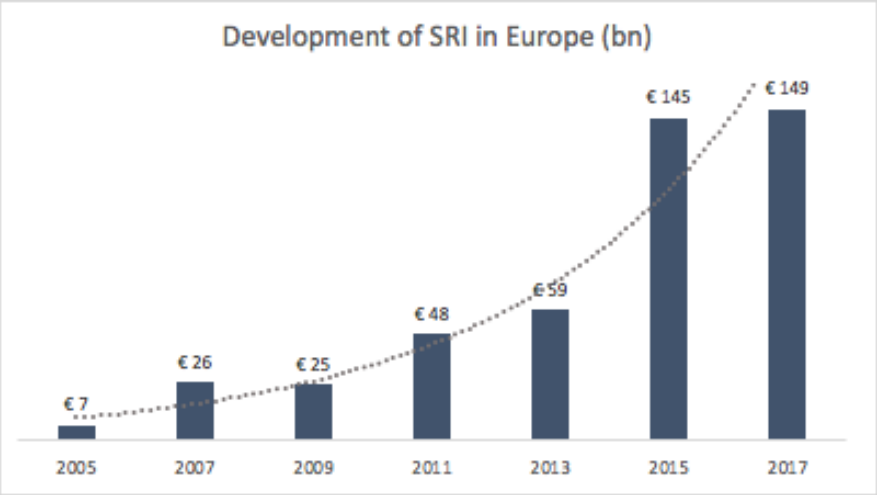
Although CSR has become a frequently used term, there is not a pre-defined and universally accepted definition of this concept (Khan et al., 2012). According to Bénabou & Tirole (2009), the purpose of CSR is to sacrifice the company's profits to satisfy society's interest. These authors explain that these interests do not only include the legal obligations, but they also include the environment, employees, ethics, overall corporate behaviour, etc.

The Green paper of the European Commission has also published a definition for sustainability[3]. It considers that companies are socially responsible if they integrate "social, environmental, ethical, consumer, and human rights concerns into their business strategy and operations; always following the law" (European Commission, 2019).

As depicted in Figure 1, there is a rapid development of SRI in Europe. It can be extracted that in 2017, the companies invested €123 bn more in sustainability than in 2007 which is an increase of 473% over ten years. This is attributed to many causes that will be analysed in the following section. However, one of the main forces that drive the increase of SRI is the stricter regulations that oblige the companies to publish CSR reports.

[3] The Green paper is a manuscript completed by the European Commission in July 2001 with the main object to promote a European framework for corporate social responsibility

Figure 1 Development of sustainability investment in Europe

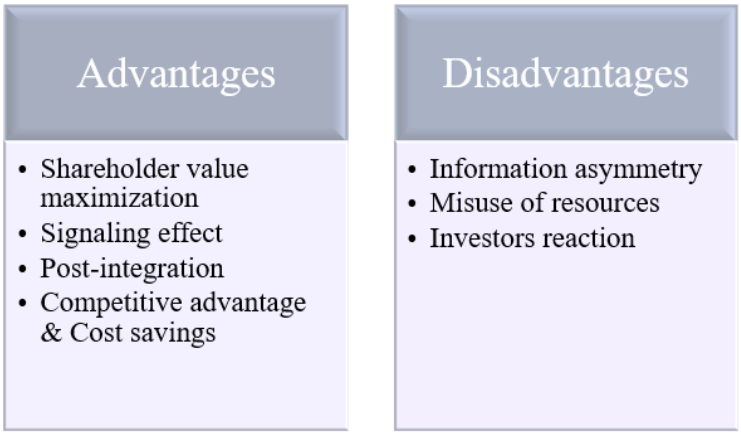


Source: Statista, 2019

3.2.2 Advantages and Disadvantages of Sustainability

The increased research over sustainability has led to two contradictory aspects. The first one supports that sustainability is adding value to the company and the second one claims that sustainability can be value-destroying for the organization. Figure 2 summarizes these two aspects which are also analysed in the following section.

Figure 2 Arguments of sustainability



Advantages of Sustainability

One of the most important advantages of sustainability is the signalling effect. According to Akerlof (1978), the signalling effect mitigates the information asymmetry in a market of lemons that pretend to have a higher value. CSR is usually an expensive investment and by investing in high-value projects, the company shows to the markets that it is not a lemon (Akerlof, 1978).

On the contrary, it signals that it has the adequate financial capital to invest in CSR. A lemon could not invest in this project. Thus, the company is also trust-worthy to complete successful M&As. Finally, since CSR is part of the required regulations, the organization signals that it is compliant, and the investors can rely on their reports.

Another important advantage of the CSR is described as the maximization of the shareholders' value mainly studied by Deng et al (2013). They argued that activist shareholders demand more commitment to sustainability from the managers of the company and that managers expect that CSR can maximize the shareholders' wealth. This argument mainly derives from previous research that found some positive relationship between CSR and financial performance (Spicer, 1978, Sturdivant & Ginter, 1977).

Furthermore, higher CSR can lead to better post-integration of an M&A. The CSR is a good proxy of the company's activities and philosophy (Meckl & Theuerkorn, 2015) and it can indicate a big part of the organization's culture (Bereskin et al., 2018). Thus, when the targets have similar CSR with the acquirers, there will be a better cultural fit. The skills of the employees, the operations and the demands of the customers will match. For example, there are some controversial business sectors such as tobacco, alcohol, arms and animal testing organizations. According to Meckl & Theuerkorn (2015), these are excluded from the CSR factors. In the extreme case where one of the above-excluded businesses is merged with a high CSR company, they will have integration problems. Their cultures and priorities will never match and there will be a small strategic fit that will make the integration almost unachievable.

From an operational point of view, companies with high CSR use less harmful resources for the environment. They prefer reduced fuel consumption and controlled air quality (James, 2015) that can save costs in the long-term. In the case where two companies with high CSR merge, they will both have reduced fuel consumption and thus better synergies and further cost-savings. Also, the customers and employees will be more satisfied, and the consolidated company will gain a competitive advantage over the non-sustainable organizations.

Disadvantages of Sustainability

One important disadvantage of sustainability is information asymmetry. According to Hahn & Lulfs (2015), managers are prone to direct the CSR reports to what the investors want to read. Therefore, there is asymmetric information between the managers and the stakeholders. Also, the extent of the audit over the sustainability reports is not very focused and precise. The gap of the information asymmetry increases in the case of M&As where high CSR bidders acquire high CSR targets. The CSR score derives from the managers' reports. M&A is also a result of the managers' decision. Therefore, the market has difficulties identifying the performance of M&As since the CSR scores could be manipulated by the managers to signal a high-performing acquisition.

In some cases, managers tend to invest the available resources in projects constrained by sustainability goals rather than projects that maximize the profitability of the company (Falkenberg & Brunsæ, 2011). They do this since they believe that they add value to the shareholders (Deng et al. 2013). However, if they keep investing in CSR without value-creation, this can lead to lower performance (Falkenberg & Brunsæ, 2011).

Finally, Yoon et al (2006) argued that there are some instances where CSR acts as a backfire for the company and has a negative impact on the investors' reaction. The authors added that if investors don't consider that the motives behind sustainability are sincere, then they will have a negative reaction. According to them, the sincerity of the motives is a combination of two aspects. The first one is the level of advertisement. The second one is the benefits to the organization from the advertisement. Thus, investors might react negatively to higher CSR as a result of agency problems (Kruger, 2015).

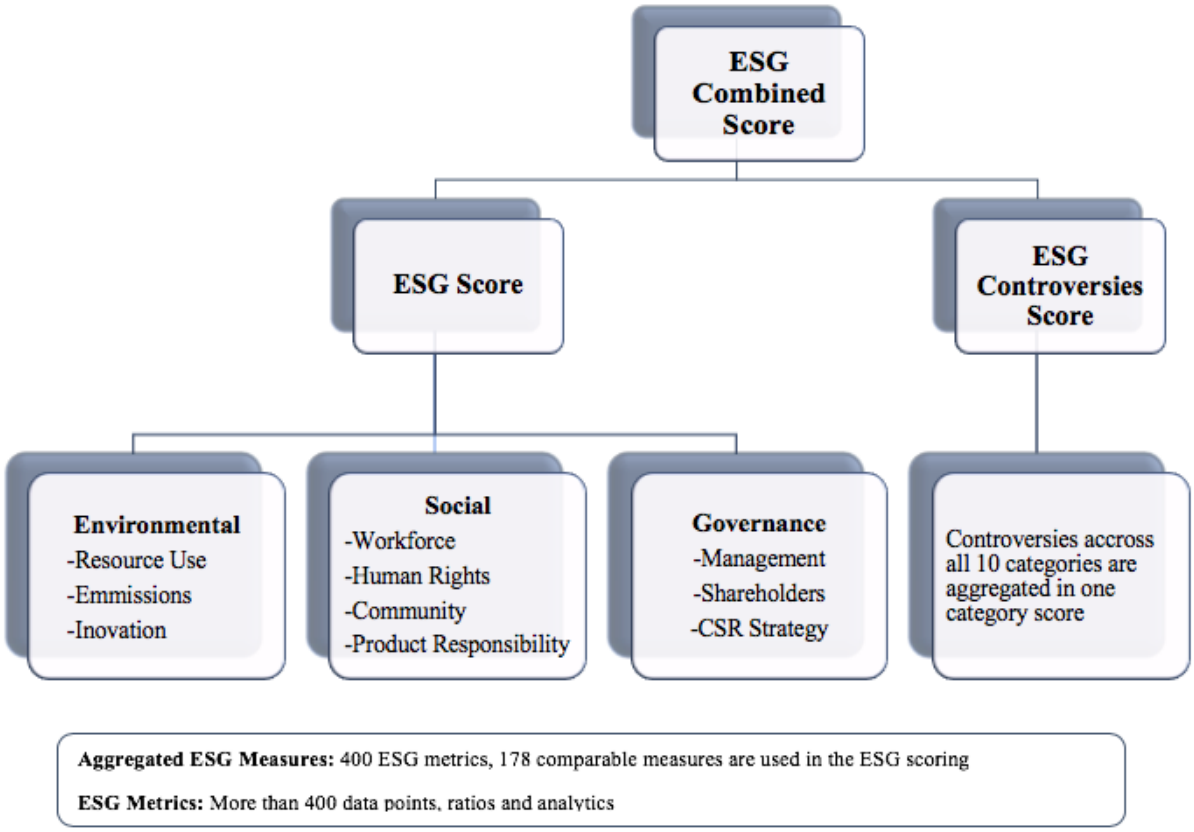
3.2.3 ESG Score

ESG *Combined* score is the proxy used for measuring the Corporate Social Responsibility of the company and it is comprised of three relevant pillars: Environmental, Social and Governance. It is also the combination of the two scores analysed below.

The first one is the ESG *score* which is constructed based on the Sustainability report of the companies. Thomson Reuters uses 400 ESG measures based on comparability and industry relevance in order to give the final score per company. The second is the ESG *Controversy* score that takes into consideration scandals in the media. This score is calculated based on 23 Controversy Measures where all new media news is captured per company and industry (Thomson Reuters ESG Score, 2018).

Each pillar of the ESG score is subdivided into other categories, as demonstrated in Figure 3 below, summing up to ten sub-scores. The full description of all the scores is in Appendix B. All the scores are calculated relative to the performance of other companies across the globe in the same industry. The data is updated early, except for the controversy score which is continually updated (Thomson Reuters ESG Score, 2018).

Figure 3 ESG Combined score decomposition



Source: Thomson Reuters ESG Score, 2018 (Adapted by the authors)

The ESG score has been used in many researchers over the company's corporate responsibility or its investment[4]. The source is also reliable which makes it appropriate for the study. Nevertheless, similarly to the limitations of every index, ESG score is a result of the organization's reports which can often be positively affected. However, the score used in this research is a combination of the management's and media's announcements that offsets any potential bias.

3.3. CEO Age

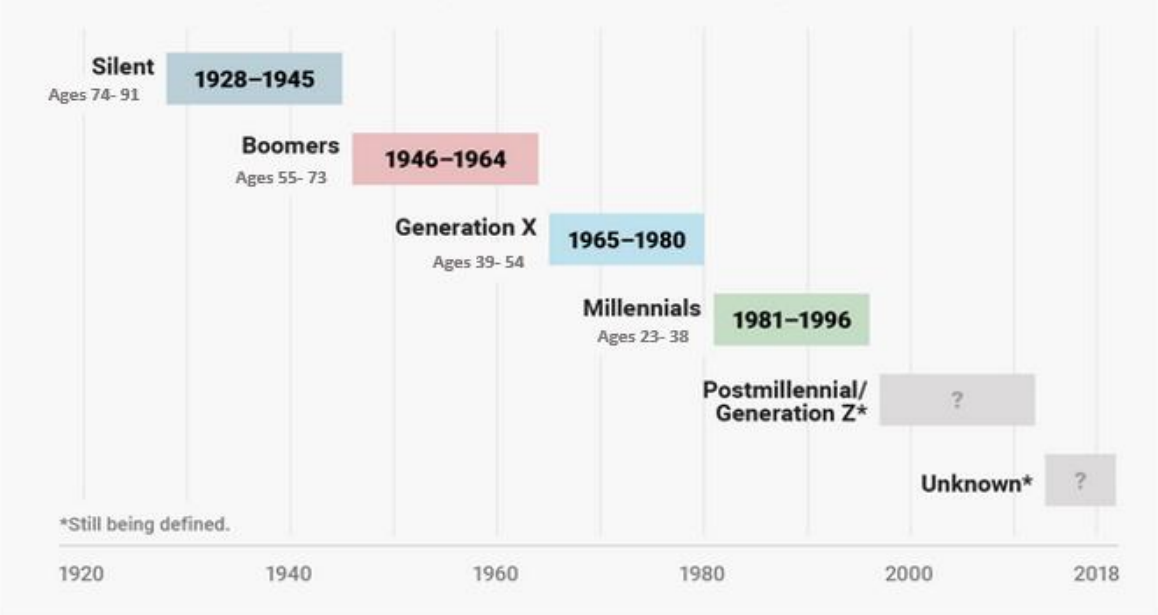
According to Rhodes (1983), age can influence the social experience of individuals since people of similar ages are expected to have a similar mentality and attitude. One way to group people into similar ages is with the use of the generation ranges. To the extent of our knowledge, there

[4] For studies that examine the CSR using the ESG score, see, for example, Wang et al (2018), Wimmer (2012)

is no published research with the range of every generation. Thus, it is not precise when the range of every generation starts or ends. The only generation that is officially designated by the US Census Bureau is the Baby Boomers (Business Insider, 2018).

According to Business Insider (2018) and as depicted in Figure 4, the people of the *Silent* generation were born from 1928 to 1945 and the *Baby Boomers* were born from 1946 to 1964. *Generation X* births are from 1965 to 1980 and the *Millennials* births are from 1981 to 1996. Although the year range of *Generation Z* is not yet defined, this is not a problem currently since it is not common for a company to has those young CEOs.

Figure 4 Generations and ages by 2019



Source: The Business Insider, 2018 (Updated by the authors for the year 2019)

Although the CEOs within the same generation could have up to 18 years difference, they have faced some common characteristics during their lives that distinguish them from other generations. For example, the Millennials were primarily affected by the economic crisis of 2008 while they were the main workforce of Europe (Business Insider, 2018). The impact of the crisis on the Baby Boomers was smaller since they were already holding competitive leading positions.

On the other hand, the Millennials were raised during the rapid increase of the media, internet, and technology (Geraci & Nagy, 2004). Since sustainability is an increasing issue in social media, it is expected that the Millennials are more sensitive to environmentally friendly ideas. Also, higher education universities cultivate students with more sustainable consumption of food and resources (Schoolman et al., 2016). This also impacts more the young generations than the old ones.

Another example is the natural disasters that every generation has faced. Cassar et al. (2017) argued that natural disasters do not only influence the harmed communities, but they also influence the entrepreneurs of the developed countries. They argued that disasters such as the 2004 Ocean tsunami make people more risk-averse since they have a fear that negative events will occur. To take this research one step further it can be argued that people who are influenced by the World Wars are more risk averse. Therefore, Baby Boomers are expected to be more risk-averse since they were raised in the era of the recovery from the wars.

4. Theoretical Background and Hypotheses

The purpose of this Chapter is to analyse the most important theories over M&As, sustainability and CEO age that help to form the hypotheses of this study.

M&A theories

Shareholders are the owners of the company while managers are responsible to run the company. Theoretically, managers should aim to maximize the shareholders' value, and this is why they are described as the "agents" of the company. The agency theory refers to the conflict between the agents (managers) and the principals (shareholders). More particularly, managers tend to behave in their interests to secure their professions and they neglect the shareholders' interests (Jensen & Meckling, 1976).

An example of an agency problem in the case of M&As is the empire building. Managers invest the excess cash to non-profitable projects (Bebchuk & Jesse, 2003) and make unprofitable acquisitions to secure their position. They prefer complicated investments that reflect their talent and they become important for the company. Shareholders cannot remove them since they are the only ones who can manage their intricate acquisitions. Therefore, they become more entrenched to the company (Ogden et al., 2003).

Another example of the agency problem is introduced by Jensen (1986) as the free cash flow theory. He argues that managers prefer to invest the excess cash to unprofitable acquisitions rather than returning them to the shareholders. According to Ogden et al. (2003), a safeguard that can minimize the above empire building is to introduce more leverage. It can give a good signal to the investors since it limits managerial discretion. The excess cash will be allocated to the repayment of the debt and not to value-destroying acquisitions.

Aligned with the previous two theories, Roll (1986) introduced the concept of the hubris hypothesis. He found that the pride of the management is also an important aspect when analysing effects on merger and acquisition events. The author claims that management is susceptive to engage in takeovers because of personal or profitable factors. Also, Roll (1986) found that managers pay a higher premium simply for believing that their valuation rationale is better than the market. This is also linked to their pride.

Sustainability theories

Introducing the CSR to the above theories, when both the target and the acquirer have high CSR, there are more possibilities to have better post-integration (Masulis et al., 2011). However, there is a problem of information asymmetry. Most of the CSR scores are based on

the reports constructed by the managers. Therefore, both the managers of the acquirer and the target company might change the CSR reports to seem more sustainable. This will mislead the investors who will believe that this acquisition will have higher performance through high CSR scores.

CEO personal characteristics theories

The demographic characteristics of the CEO can affect the firm's performance. Examples of these demographic characteristics are age, gender, tenure, educational level and educational specialization (Huang, 2013). The gender of the CEO is important since boards with more gender diversity tend to have more sustainable policies (Kassinis et al., 2016).

The tenure can give valuable results for the CEO's behaviour. For example, Aluto & Hrebiniak (1975), argued that longer tenure is linked with a higher commitment to the status quo of the CEOs and thus higher social structure and values. Therefore, CEOs with longer tenure have a better understanding of the structure of the organization (Kanter, 1977). Also, long-tenured teams have built a specific way of communicating which is more efficient than newly built firms (Wiersema & Bantel, 1992). Yim (2013) argued that tenured CEOs are more likely to make acquisitions.

According to Serfling (2014), the age of the CEO has an imperative impact on risk-taking and firm performance. People of similar age are expected to have a similar mentality and attitude (Rhodes, 1983). Although CEOs of the same generation might have a difference in their age of up to 18 years, they also have some common characteristics that distinguish them from other generations. Therefore, CEOs of similar age have similar experiences and mentality. This can lead to easier post-integration and higher M&A performance when the target and acquiring CEO have a similar age. However, there are different opinions on whether better CSR performance comes from old or young CEOs.

On the one hand, Huang (2013) argued that tenure is positively associated with CSR performance. The authors of this paper believe that the age of the CEO is also a part of the tenure of the CEO. For example, a chairman who works for many years in the same company is also older. Therefore, this theory implies that the higher the CEO age, the higher the CSR performance will be. Furthermore, DeChow and Sloan (1991) argued that people who are closer to retirement are not concerned with increasing their future wealth since their wealth is already established. The authors argued that the old managers are not concerned to secure a future job and thus they take risks that young managers would not take. An example of a risky decision is to manage the earnings (Davidson et al., 2007). Therefore, there is an economic argument where old CEOs try to manage CSR reports to achieve higher CSR scores. They do this since they expect that it will lead the company to higher performance on the M&As.

On the other hand, Wiersema & Bantel (1992) results are different than the previous ones. They argued that young top managers are more likely to take risks. They added that young managers might change the company's current strategy. This means that young managers are more likely to invest in sustainability and take the risk of changing current operations. While people are getting older, they prefer a quieter life (Bertrand and Mullainathan, 2003). Hence, they are more risk averse (Serfling, 2014). Also, old executives prefer job security, show less flexibility and are less likely to undertake changes in corporate strategy (Wiersema & Bantel, 1992).

Based on the above, there is an economic argument where the CEO age and CSR score of the acquiring company are important for the M&A performance. Moreover, it is interesting to analyse how the target's characteristics interact with the acquiring company's characteristics. The age of the CEOs can impact their corporate behaviour (Serfling, 2014). Thus, there is an economic argument that if the acquirer and target CEOs are from the same age group, there will be better post-integration. Hence, higher M&A performance. Finally, research has argued that the CSR score of the target affects the M&A performance (Aktas et al., 2011). It is even more interesting to analyse how the target's CSR score interacts with the acquirer CEO age for the M&A results. The hypotheses of this study are the following:

H1: The performance of the M&As is affected by the CEO age and the CSR score of the acquiring company

H2: The performance of the M&As is higher when both the CEOs of the acquiring and target company belong to the group of the old age[5]

H3: The performance of the M&As is higher when CEOs of the group of old age acquire companies with high CSR[6]

[5] As it will be discussed in Chapter 5, the old group includes the CEOs that are older than 55 years old which is the mean of the sample. The rest of the CEOs are grouped to the young age category.

[6] As it will be discussed in Chapter 5, the high CSR score of the target is the score which is higher than 47 which is the median of the sample. The rest of the CSR scores are grouped to the low CSR score category.

5. Empirical Approach

In this Chapter, we start by exploring the Event Study and the steps to calculate the cumulative abnormal returns. Then, we explain the OLS for multiple regression and present some validity tests and assumptions.

5.1 Cumulative Abnormal Returns

5.1.1. Event Study

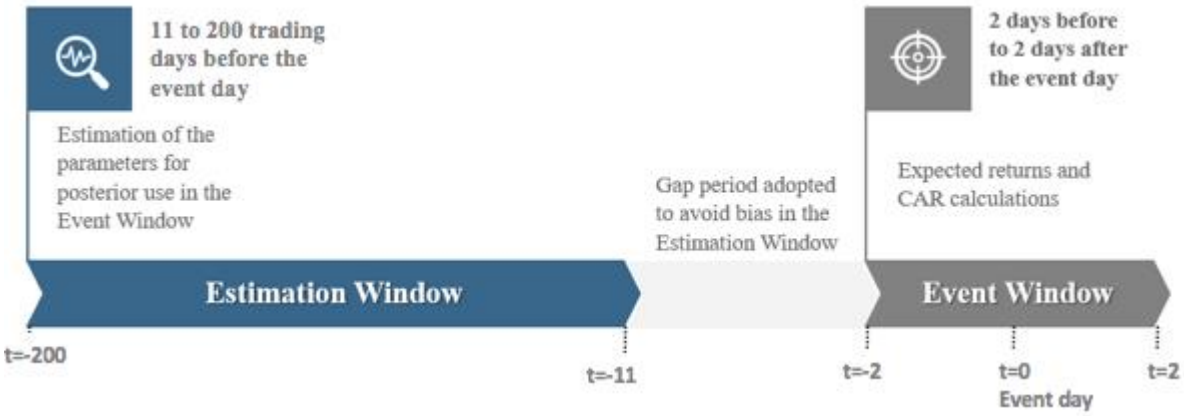
The Event Study is a well-established technique that measures the short-term performance of the company after a specific event, such as IPO or earning announcements (MacKinlay, 1997). In this present study, the event is the announcement of a merger or acquisition and the performance measuring tool is the stock returns of the acquiring firm around the event date.

This method is based on the Efficient Market Hypothesis, which states that the market properly reflects the information of an event because of the investor's rationality (MacKinlay, 1997). Therefore, the stock return is assumed to reflect the market expectation about the performance of a specific event.

Following the lead of McKinley, we adopted the Market Model, because it brings some advantages over the other models. The other models are divided into two groups: Statistical and Economic (MacKinlay, 1997). The two most well-known Statistical models are the Constant Mean Return and Market Model. Economic models are the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT).

The advantage of the chosen model over the Constant Mean Model is the improvement of the abnormal returns. More particularly, the use of the Market Model is proper since it removes the market events that are not related to the acquisition and keeps only the effects related to the M&A event. Furthermore, it avoids the assumptions required by the CAPM model that makes its use fragile (MacKinlay, 1997). This approach starts by calculating the Estimation and Event Window. Figure 5 describes both terms in a timeline for a better understanding of their meaning.

Figure 5 Timeline of Event and Estimation Window



5.1.2 Event Window

The Event Window is a range of days before and after the event day. This range is used for the calculation of the abnormal returns. The risk of leakage of information before the takeover announcement can affect the Event Study if we don't use the appropriate Event Window length (Martynova & Renneboog, 2009). This fact is an economic argument for extending the Event Window range of days. Therefore, a more extended window can capture better the effects on the stock return due to the market reaction around the event day. On the other hand, when we assume that the market is efficient, a shorter Event Window is appropriate for the analysis since the effect on the stock price is captured straight after the announcement (Andrade et al., 2001).

The main Event Window used in this study is based on previous literature which is included in Table 1. This is the range of [-2,+2], which captures two days before and two days after the event day. Although we used CAR [-2,+2] for the interpretation of our results, we also used two more windows, which are [-1,+1] and [-3,+3], to check whether the results are consistent.

5.1.3 Estimation Window

The Estimation Window is the range of days considered to estimate the beta between the observed returns of the firm and the return of the market index, according to Equation 1. Using the same approach as Deng et al. (2013), the Estimation Window was defined from eleven days to two hundred trading days before the announcement day of the M&A [-11, -200]. The choice of the window range is proper because of mainly two reasons. First, it contains a reasonable amount of days that would avoid less bias in case of an atypical oscillation during the period. Second, it has also a reasonable distance from the event day, which will prevent from possible bias caused by leakage of information upon the M&A (MacKinlay, 1997).

$$R_{i,t} = a_{i,t} + \beta_{i,t} R_{M,t} + \varepsilon_{i,t} \qquad \textbf{(1)}$$

Where *Ri,t* is the observed return of the firm *i* during the period *t; RM,t* is the return of the market index during the period *t*; α is the estimated intercept coefficient for the firm *i* during the period *t*; β is the estimated slope coefficient for the firm *i* during the period *t*; ε is the regression residual of the firm *i* during the period *t*.

We use the MSCI Europe Index as a proxy for the market, which captures large and mid-cap across European countries in various industries. The choice is proper because it is a good geographic representation of the study and it contains several industries like the present study. Moreover, this index is highly used by research papers when applying this model[7].

The observed stock prices of the acquiring firm were collected from Thomson Reuters following the daily range of the Estimation Window. The daily returns were then calculated through the daily prices according to Equation 2. The same is done for the calculation of the return of the market index.

$$R_{observed,i,t} = ln(\frac{P_{i,t}}{P_{i,t-1}}) \quad \textbf{(2)}$$

Where *Pi,t-1* is the observed stock price of the firm *i* on the day before t; *Pi,t* is the price of the firm *i* on day *t*.

5.1.4 Expected Return

The expected return is the estimated return of the acquirer if the event had not occurred. After obtaining the estimated parameters for each event, the expected returns of the company are calculated using the Event Window range of days and according to Equation 1 again.

5.1.5 Tests of Cumulative Abnormal Returns

The expected returns are then used to compute the abnormal returns (ARi,t). More particularly, the expected returns are subtracted from the observed returns for each day and deal of the Event Window as depicted in Equation 3.

$$AR_{i,t} = R_{observed,i,t} - R_{expected,i,t} \quad \textbf{(3)}$$

To compute the CARs, the abnormal returns of the Event Window are summed for each event, according to Equation 4. The calculations were executed on Stata through the looping tool "for value". This tool makes it possible to repeat this completed procedure for all the events in the sample.

[7] For studies that adopt the MSCI index, see, for example, Bassen et al (2010), Martynova & Renneboog (2009)

$$CAR\ [-n, +n]\ =\ \sum AR_{i,t} \qquad \textbf{(4)}$$

We also conducted a test to verify the significance of the CAR. We tested all the CARs by grouping all the events. This test is better for our study since we analyse all the events together as a whole, and not individually. Since the p-value was lower than 5%, they were also statistically significant in a 95% confidence interval. To address the outliers that would bias our dependent variable, we constructed a Box Plot (Appendix C). We found three deals with values of more than 20% or -20% and removed them from the sample[8]. Constructing the Box Plot again, the dependent variable seems reasonable for statistic proposes.

5.2. Model using Ordinary Least Squares

In addition to the Event Study, the Ordinary Least Squares method (OLS) for multiple regression is also used.

The first OLS regression in Equation 5 aims to test H1. It contains the CSR score and CEO age of the acquiring company in addition to the interaction between them. The interaction term is represented by the variable Age_CSR_mean. This variable is the interaction between the acquiring CEO age and the CSR score after deducting their means which are 55 and 53, respectively.

Hypothesis 1: The performance of the M&As is affected by the CEO age and the CSR score of the acquiring company

$$CAR = \beta_0 + \beta_1 \cdot CSR\_Score + \beta_2 \cdot Age\_CEO\_acquirer \qquad \textbf{(5)}^{9}$$
$$+ \beta_3 \cdot (CSR\_Score - 53)x(Age\_CEO\_acquirer - 55) + \delta \cdot \sum Controls + \varepsilon_i$$

The second regression (Equation 6) aims to test H2. It has an interaction term between two dummy variables: the age group of the target and acquiring CEOs. The coefficient of the interaction term reveals if there is an impact on the M&A performance when the CEOs of the acquiring and target companies belong to the same age group. We divided the two age groups into young and old according to the sample median. Therefore, the dummy variable is "one"

[8] The 3 outliers were excluded from the sample since the results of the regressions were different when we exclude them than when we include them to the model

[9] For illustration purposes, the control variables are not shown in the equation.

when both the acquirer and target CEOs are older than 55 years old. The dummy is "zero" when they are younger than 55.

Hypothesis 2: The performance of the M&As is higher when both the CEOs of the acquiring and target company belong to the group of the old age

$$CAR = \beta_0 + \beta_1 \cdot Age\_CEO\_acquirer + \beta_2 \cdot Age\_CEO\_target + \beta_3 \cdot (Dummy\_Old\_acquirer)x(Dummy\_Old\_target) + \delta \cdot \sum Controls + \varepsilon_i \quad (6)$$ [10]

The third regression (Equation 7) aims to test H3. It has an interaction term between two dummy variables: age group of the acquirer and the target CSR score. The first one follows the same criteria as Equation 6 where the old acquirer is more than 55 years old. The second variable is "one" when the CSR score of the target company is higher than the median (47) and "zero" when lower.

Hypothesis 3: The performance of the M&As is higher when CEOs of the group of old age acquire companies with high CSR

$$CAR = \beta_0 + \beta_1 \cdot Age\_CEO\_acquirer + \beta_2 \cdot CSR\_Score\_target + \beta_3 \cdot (Dummy\_Old\_acquirer)x(Dummy\_High\_CSR\_Score\_target) + \delta \cdot \sum Controls + \varepsilon_i \quad (7)$$ [11]

5.3 Assumptions & Validity

When using this OLS for multiple regression, the Gauss Markov (MLR1-MLR5) assumptions are set to bring proper results and the best linear unbiased estimators (BLUE) (Bailey, 2019). Also, the discussion and the tests conducted to verify the assumptions are presented in Chapter 7.

MLR 1 Linearity in Parameters: The model assumes that the parameters of the regression, which are the slope and intercept, are linear when related to the dependent variable (Bailey,

[10] For illustration purposes, the control variables are not shown in the equation.
[11] For illustration purposes, the control variables are not shown in the equation.

2019). We assume this assumption holds for the model, since there is no reason to believe that the model presented has not linear parameters.

MLR 2 Random Sampling: This assumption implies that the sample collected for the study should be randomly selected to be a good representation of the population and to avoid biases (Bailey, 2019). We further verify and discuss the sample selection in Chapter 7.

MLR 3 No Perfect Collinearity: This assumption implies that there is no linear relationship between any two variables in the regression (Bailey, 2019). We used a correlation Matrix to verify that (Chapter 7).

MLR 4 Zero Conditional Mean: This assumption states that the error term of the regression should not be correlated to the explanatory variables of the model (Bailey, 2019). When the correlation is found, then the variable is endogenous and, if not, it is exogenous. This assumption has great importance to guarantee an accurate estimation of the parameters and, thus, a correct interpretation of the model. In the presence of endogeneity, it is important to find an appropriate instrumental variable that could correct the bias. We further analyse whether our main explanatory variables are affected by endogeneity in Chapter 7.

MLR 5 Homoscedasticity: This assumption implies that the variance of the error term is constant, which means that it does not vary with the change of the explanatory variable (Bailey, 2019). To verify this condition, it is necessary to conduct the Breusch-Pagan test.

MLR 6 Normal distribution: When applying statistical inference for the model parameters, it is conventional to add a new assumption to the Gauss Markov ones, which turns out to be the Classical Linear Model (CLM) assumptions. MLR6 assumption implies that the error term is normally distributed and not dependent on the explanatory variables (Bailey, 2019). We further discuss the diagnostic tests in Chapter 7.

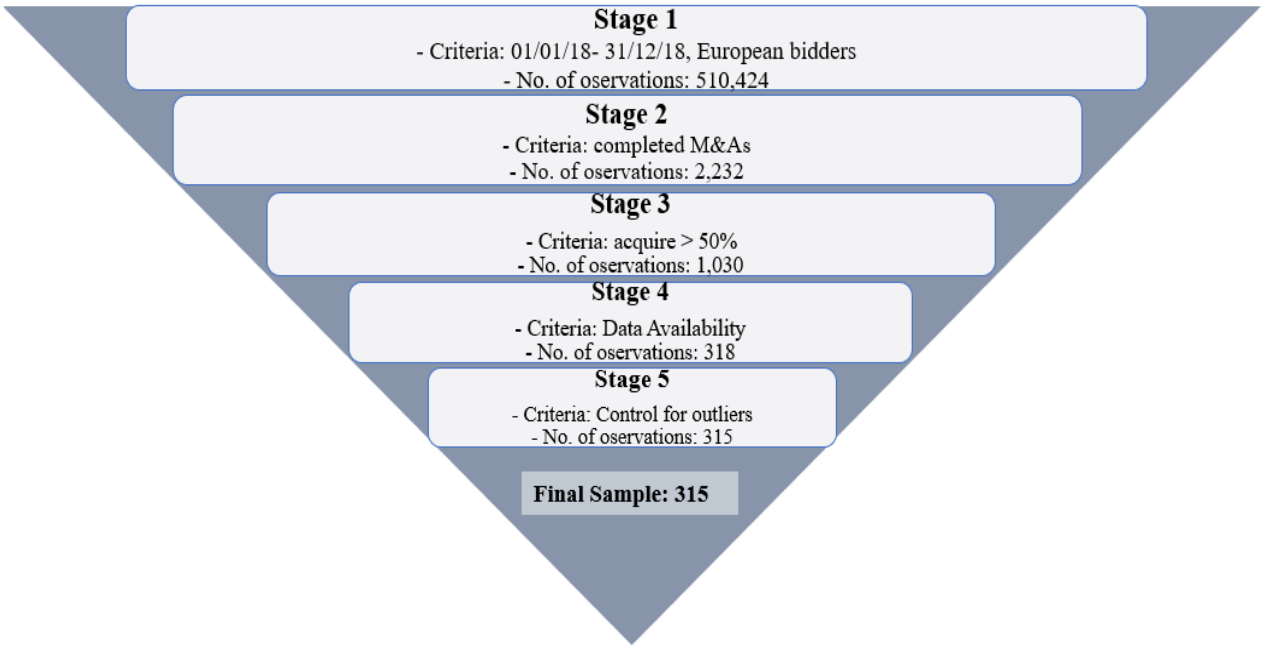
6. Data and Descriptive Analysis

This Chapter includes the process and the criteria of the data collection. It has the definitions of every variable and the related articles that use these variables. First, we explain the first results over the variables. Then, we analyse the reliability, validity, and limitations for the collection of the sample.

6.1 Data Collection & Criteria

The data of this research is collected from secondary databases and reliable sources. This paper builds on and extends on a data set retrieved from Zephyr by Bureau van Dijk. This source is commonly used by academics whose main focus is on mergers and acquisitions (Bollaert & Delanghe, 2015). In addition to Zephyr, Thomson Reuters through Datastream and Bloomberg Terminal were used to complement the additional data of the explanatory variables and some control variables as it will be described later.

Figure 6 Data collection process



As described in Figure 6, the ***first stage*** with an initial population of 510,424 M&As was downloaded from Zephyr. Only M&As were included and no other transactions such as IPOs, joint ventures, etc since they are the main focus of this study. This population included all the

M&As from the 1st of January 2008 to 31 December 2018. Furthermore, the initial population was downloaded only for European bidders since our main intention was to analyse European trends.

In the ***second stage***, only the completed deals were included in the sample. Following the previous research (Aktas et al., 2011, Deng et al., 2013), this paper intends to assess the performance of M&As and this can be determined through completed M&As. There is no reason trying to define the M&A performance if it is not completed. In this case, we would include returns which are by default non-successful mergers and our sample would be biased. This criterion resulted in a reduced sample of 2,232 deals.

In the ***third stage***, the sample was eliminated to the transactions where the acquirer held more than 50% after the acquisition. This was in order to keep acquisitions where the acquirer had the majority stake and thus exercised control over the acquired company. The control is important for the extraction of valuable results over the performance of M&As. After this point, the sample totalled to 1,030 deals and the eliminations of stage four and five are dependent on the availability and quality of the data.

More particularly, the ***fourth stage*** includes all the transactions for which data was available in Zephyr, Datastream or Bloomberg. In some cases of the CEO age, a manual search was conducted. Thus, the fourth stage amounts to 318 deals. At this point, the sample is reduced due to the limitations of different types of deals, country, and industry variables. Thus, the loss of 69% of the deals due to data unavailability does not lead to a biased sample. Also, no pattern was identified when screening for the eliminated deals of this stage.

In other words, the excluded deals were eliminated for different reasons (i.e. missing stock price, financial performance, etc) and they didn't have similar characteristics to each other (i.e. different industry, country, size, etc). The authors of this paper concluded that the data deficiency was due to smaller acquirers/targets with no adequate published information. Nevertheless, it was impracticable to run the regressions of this Event Study with missing data. Finally, the ***fifth stage*** of 315 deals is comprised of trimming for extreme values. More particularly, three outliers were excluded since they would bias the dependent variable.

6.2 Variables Description

This study aims to analyse the impact of the CEO age and CSR score on the performance of M&As. The variables are included according to the theories that already exist for related topics. They are divided into Dependent, Explanatory, and Control variables. Appendix D summarizes

the variables included in previous research and the authors that conducted the research.

6.2.1 Cumulative Abnormal Returns

The dependent variable is the CAR and is constructed as described in *Chapter 5*. The variable used for the interpretation of the results is CAR [-2, +2]. It derives from the cumulated daily abnormal stock returns from two days before to two days after the announcement day. The market proxy is the MSCI Europe Index that covers 85% of the free float adjusted market capitalization across the European Developed Markets equity universe (MSCI, 2019).

Table 2 presents a summary of information regarding the sample variable, including CAR. The dependent variable average is 0,13%, where 14% is the maximum and -19% is the minimum values after removing the outliers. These facts make our sample reliable and valid to use it.

6.2.2 Explanatory Variables

The main explanatory variables are the CSR score and the CEO age, as presented in Table 3. The **ESG Combined Score** is the proxy used for CSR and it includes both the score that derives from the self-reported information as well as the negative events reflected in global media. This variable was downloaded from Datastream and the **CEO age** was downloaded from Bloomberg. For the ages not provided by Bloomberg, the information was manually collected from the Annual Reports of the year of the announcement or Bloomberg online database.

The average CSR score in the sample is 53 and the median is around 50, which shows that the sample is balanced between the good and bad scores. The minimum score is 19,6 and the maximum is 89,8. The average age of the CEOs is 55, where the maximum value is 66 and the minimum is 42.

Regarding the generations, 85% of the M&As were conducted from CEOs who belonged to the Baby Boomers Generation from 2008 to 2018. During these years, the Baby Boomers were aged from 43 to 66 years old. The samples of previous researchers have found that the average age of the CEO is 55 years old which is also aligned with the mean of the present sample[12]. Thus, it is reasonable that the Baby Boomers are the main population of this sample. Since our sample resulted in many observations of the Baby Boomers, we didn't use the generation range, but we created a new classification of our explanatory variable. In this classification, the CEOs can belong to one of the two categories: old or young. Old CEOs are more than 55 years old and young CEOs are less than 55 years old (where 55 is the mean of our sample).

[12] For studies with samples where the mean age of the CEO is 55 years old, see, for example, Yim (2013), Bliss & Rossen (2001)

6.2.3 Control Variables

The control variables are separated into two categories: deal characteristics and bidder's characteristics. The authors describe these variables in detail in Table 4. In the first category, we first control for the ***country*** which measures whether the acquirer and the target operate in the same country. The country is an indicator of the target's and acquirer's corporate culture and regulations (Kogut and Singh, 1988, Edwards & Edwards, 2011). The previous results over the impact of the country are contradictory. The same country between the acquirer and target can have either a positive impact from the geographical, operating and technological synergies (Marks and Mirvis, 1993, Nocke & Yeaple, 2007) or negative due to the information asymmetry. As depicted in Table 5, Great Britain and France are the countries with more acquisitions since these two made 48% of the total European acquisitions. Table 5 also demonstrates that most acquisitions were performed before 2015 whereas the last years faced decreased M&A transactions. Moreover, 32% of M&As are within the same county.

The control variable of ***industry*** measures whether the target and the acquirer operate in the same industry. Mergers from similar industries can be successful since the new company will be more competitive with advanced technology and economies of scale (Chon et al., 2003, Nocke & Yeaple, 2007). However, they can also have a negative impact of the increased costs (Hijzen et al., 2008). According to Table 5, Great Britain makes more acquisitions in the industry of Manufacturing whereas France makes more acquisitions in the industry of Finance. Moreover, 80% of the M&As are within the same industry. Furthermore, the ***relative size*** is the total assets of the target divided by the total assets of the acquirer. Small mergers tend to receive less attention than bigger ones, causing less integration and, thus, less value creation (Larsson & Finkelstein, 1999). According to Table 2, the average of the relative size between the acquirer and the target is 18%.

The ***method of payment*** describes whether the acquirer pays with cash or stock for the acquisition. Cash deals signal that managers have space for empire building whereas the stock deals are paralleled with the public offering of new equity (Chang, 1998). Thus, cash deals have a negative impact whereas stock deals have a positive impact on the performance of M&As. Finally, it is important to include a control variable that describes what percentage of the target is held by the acquirer. Thus, ***Toehold*** (Deng et al., 2013) describes whether the acquirer holds at least 5% of the target before the acquisition announcement. In 35% of the M&As, the acquirer already holds at least 5% of the target. The industry variable was extracted from Datastream and all the others from Zephyr.

In the second category, we control for the bidder's characteristics. ***Tobin's q*** is the market value of assets divided by the book value of assets. It is commonly used by the researchers who try to analyse the M&A performance (Deng et al. 2013, Masulis et al., 2007) and it has both positive

and negative results. According to Table 2, the average number in the sample for Tobin's q is 1,54. The ***Free Cash Flows*** are the Operating Income before depreciation, income expenses, income taxes, and capital expenditures, scaled by the number of shares. They give a signal of empire building and, hence, they harm the M&A performance. However, this can be offset from the increased ***leverage*** that restricts the managers since they use the excess cash to repay the debt (Masulis et al., 2007). According to Table 2, the average acquirer's leverage is 24,7% and 83,8 per share for Free Cash Flow.

Furthermore, the ***size of the acquirer*** is the book value of the acquirer's total assets. It affects negatively the mergers since larger acquirers can pay larger premiums that result in value-destroying M&As (Masulis et al. 2007, Deng et al., 2013). ***Market to Book value of Equity*** is the Market value of equity divided by the Book value of equity of the acquirer. According to previous research (Deng et al., 2013), it harms the performance of M&As since the market value reflects whether the company is over or undervalued. According to Table 2, the average Market to Book Value of equity is 9,6.

Finally, the **CEO tenure** is added in the model as a control variable for the CEO age, since previous research shows that tenured CEOs are more likely to make acquisitions (Yim, 2013). The CEO tenure is 5,7 years, where the maximum is 40 and the minimum is 3 months. It seems that there is a large range of CEO tenures which is in contrast with the small range of the CEO age in our sample. Tobin's q and CEO age were extracted from Bloomberg and all the other variables from Datastream.

6.4 Data Validity and Reliability

When the authors of this paper address the validity, they attempt to decide how the sample and regression tests cover the paper's objectives. According to Table 2, the mean, maximum and minimum values of the variables do not have significant discrepancies from papers that analysed similar topics (Deng et al., 2013, Yim, 2013). This fact validates the data used in the regression and also adds to its reliability. Furthermore, the method selected for this research question is the Event Study which is appropriate when analysing the announcement effects of mergers and acquisitions (Deng et al., 2013, Aktas et al., 2011). This also strengthens the validity of this data.

The reliability is an essential aspect of the data since it verifies the consistency of the paper. For this reason, this aspect has been fully taken into account in every step during this study. The data was collected only from reliable sources, such as Thomson Reuters, Zephyr, and Bloomberg. Furthermore, a fully detailed description was presented for all variables considered

in the model. Moreover, the study was based on reliable journals in the finance perspective, such as the Journal of Corporate Finance. Throughout that, the reader has a clear understanding of the study and also can use the information for future researches.

6.5 Data Limitations

The first limitation of this paper is the sample size. The size of the sample depends on Datastream or Bloomberg availability of the variables used in our study, being either the control or the main ones. Also, the calculation of the CARs demands a high amount of stock prices since we used an Event Window from two hundred to eleven trading days before the event day. This made it more difficult to maintain the sample size since it requires the firm to have long historical data.

Some variables impact the performance of M&As and they are not included in this paper. The first not included variable in the model to mention is the *nature of the bid* which describes whether the bidder approached the target with a friendly or hostile way. According to Craninckx & Huyghebaert (2011) and Deng et al. (2013), hostile acquisitions are more likely to fail due to the resistance from the employees. Nevertheless, the authors argued that hostile acquisitions are rarely observed since most of the acquisitions are friendly.

Another frequently used variable for M&As is whether the target is *private or public* (Masulis et al., 2007, Deng et al., 2013). It describes whether it is owned by the government (public) or not. There are greater returns in the case of private targets since the acquirers can usually achieve a discount in this case (Masulis et al., 2007). Also, *cultural fit* is another important aspect (Gaughan, 2015) for the integration of the two companies but it is very difficult to capture this measure. Nevertheless, it is indirectly captured through the industry and country variables.

Another limitation worth mentioning is CEO rotation. In some cases, the CEO could have changed along the M&A deal process. For this reason, in the case there was a new CEO in the year of the acquisition, we used the age of the previous CEO. We did this since the acquisition was probably a result of the previous CEO's decisions. The authors believe that since the M&A decision is a long process, this is a conservative way to guarantee that the age data collected refer to the CEO that took the M&A decision.

7. Empirical Results

This Chapter outlines the diagnostic tests conducted during the regressions, the results from the regressions and their interpretation. It also includes potential future trends that derive from these results.

7.1 Diagnostic Tests

When running the regressions of this study we concluded that that Efficient Market Hypothesis holds for our model since the stock prices incorporate timely the new information of the announcement of the M&As. Moreover, we performed some diagnostic tests with the use of the Classical Linear Model (CLM) assumptions previously described in Chapter 5.

Regarding the MLR 2, the data was indeed collected randomly which fulfils the random selection assumption. Moreover, when analysing the sample, no patterns were identified that could show the presence of outliers. The mean, maximum and minimum values seem consistent with the expectations and a good representation of the population. The assumption MLR 3 of No Perfect Collinearity is captured through the correlation matrix, presented in Table 6. It shows that there is not a perfect neither correlation among the variables. Moreover, Stata also checks the multicollinearity assumption and drop variables when it is necessary. This means that this assumption holds for the model.

Regarding the MLR 4, the past literature has provided some other sources for the variable CSR be endogenous. First, the choice for sustainability can be related not only to an attitude from the managers (Hyunjung et al., 2018) but also to internal aspects, such as policies of the company or shareholders' pressure. Second, bad-intentional management can apply to the sustainability approaches if they know the expected positive market impact on performance. This makes earning management correlated to the CSR (Hyunjung et al., 2018). This last argument is presented in the literature as a reverse causality between CSR and financial performance, which implies that financial performance causes a more engaged CSR and not the opposite (Deng et al., 2013). However, in the case of studying the announcement of M&As, it is not reasonable to believe that the stock price would cause a better CSR. The use of instrumental variables is common when analysing the financial performance but not that common when the CAR is the dependent variable.

Deng et al. (2013) used the religious rank of each US state as an instrumental variable to the CSR. Gao & Zhang (2015) used discretionary accruals as an instrumental variable, and another

common approach used in the literature is the R&D of the company (Ye & Zhang, 2011). These authors found evidence that the instrumental variable is statistically correlated to CSR, but not with the dependent variable and neither with the error term. Thus, this assumption is fulfilled. In our case, neither of these approaches brought satisfying results in terms of relevance and strength. A possible reason for the different findings regarding the significance of the religious as an instrumental variable is that these studies are conducted in a different geographic location. Deng et al (2013) applied variable religious for the US states while we conducted a study in Europe.

Since the score used in the study contemplates the media scandals and not only the managers' interpretation, it is possible to infer that we are already controlling for the presence of endogeneity. The media scandals adjust the score in case a company does not act accordingly to the reported. This is the same idea presented by the instrumental variables. Furthermore, the second main variable, age of the CEO, is seen as an exogenous variable in the past literature (Yim, 2013) as well. The economic argument for being exogenous is that it is not reasonable that the age of the CEO can be affected by other aspects.

Moreover, in order to properly estimate coefficients of the regressions, other variables that have some empirical evidence of an impact on the performance of M&A need to be added to the model. These are the control variables that are discussed in the Chapter 6 and also described in Table 4. Considering them in the regression is important because they ensure a better coefficient estimation by avoiding the omitted variable bias problem. On the other hand, over-controlling is also considered a problem since it can increase the risk of multicollinearity among the variables. The choice of the control variables for this model is appropriate and motivated by previous empirical research.

The assumption MLR 5 of Homoscedasticity is captured when conducting the Breusch-Pagan test and White test for each study-Hypothesis. The results in Table 7-9 show that the p-value is lower than 5% and, thus, the variance is not homogenous, except for the Hypothesis 2. The scatter graph (Appendix E) also confirms the results, since the dots are spread out in the graph. Hence, we reject the null Hypothesis and the assumption does not hold in the confidence interval of 95%. Violation of this assumption doesn't bring a biased parameter but can affect the statistical inference. To address this problem, we use the robust standard error in the regression to have more precise results.

The assumption MLR 6 of Normal Distribution is captured through Appendix F. It shows that the distribution is close to the Normal, which is enough for fulfilling this assumption and using the statistical inference. Moreover, since the sample is big, this condition is not necessary to be checked.

7.2 Analysis of Results

The findings of our study give valuable insights for the M&A trends and they enrich the existing literature with one more important coefficient that should be added when studying the M&As. The results of our hypotheses are summarized in Table 10 and are further analysed in the rest of this section.

H1: The performance of the M&As is affected by the CEO age and the CSR score of the acquiring company

In order to test H1, we first run a regression where the CEO age and CSR score of the acquiring company were the main explanatory variables (Table 11.1). In the second regression, we added the interaction term in order to analyse its impact[13] (Table 11.2). In the third step (Table 11.3) we run a regression using the robust standard errors in the model. The authors interpret the results of the regressions in the concept of magnitude, sign, and statistical significance. The magnitude refers to the size of the coefficient of the variables. The sign refers to the positive or negative impact of the coefficient to the performance of M&As. The statistical significance refers to the p-value of the variable.

According to Table 11.1, the *CSR score* of the acquiring company is statistically significant to explain the model. The increase of the CSR score by one point will increase the CAR by 0.04 and this is not a considerable magnitude. As expected, the positive sign of this variable indicates that the higher CSR score will lead to higher performance of the M&A. This can be explained by the fact that the market interprets the higher CSR score as a result of higher cultural and ethical values for the organization (Bereskin et al., 2018). The shareholders trust more the companies with higher CSR scores. They believe that acquirers with high CSR will not make value-destroying acquisitions in the concept of empire building. The high CSR acquirers are expected to be more responsible and to have better post-integration results.

According to Table 11.1, the *age of the CEO of the acquiring company* is statistically significant to explain the model. The increase of the CEO age by one year will increase the CAR by 0.07 which makes the magnitude of this variable higher than the CSR score. The positive sign of the variable shows that when the CEO is old, the market expects more successful acquisitions[14]. This can be attributed to the fact that old CEOs are closer to retirement and are not concerned about their future performance and recognition (DeChow and Sloan, 1991). Also, old CEOs are

[13] As described in Chapter 5, the interaction term is the combination of the CEO age and the CSR score of the acquiring company, after deducting the mean values of the sample. The mean values are 55 for the CEO age of the acquiring company and 53 for the CSR score of the acquiring company.

[14] As described in Chapter 5, old CEOs are considered the CEOs that are older than 55 which is the mean of the sample.

more experienced and have a better understanding of their organization (Huang, 2013). Therefore, they have a better understanding and more valuable insights into the target's operations as well. Their long-term experience enables them to find a promising target that can also fit the organization's culture. In other words, they select their target with more insightful criteria and not impulsively.

In the second step (Table 11.2), we added the interaction term to the first model. After this addition, the variables CEO age and CSR score discussed above did not have a significant change in terms of magnitude, sign or statistical significance. The *interaction between the CEO age and CSR* is also statistically significant and it has a negative coefficient. This means that when both the CEO age and the CSR score are lower than their means, the negative impact on CAR is exacerbated by 0.01. This does not imply a big magnitude for the model. When some of them or both are above the mean, the positive impact on the M&A performance is strengthened. Table 12 presents some simulations to better explain the interaction impact.

In the first simulation of Table 12, the firm's CSR score is 52 and the CEO age is 54. These values are both one-point below their means, which are 53 and 55 respectively. Both terms are negative (i.e. less than their means) and the coefficient of the interaction has a negative sign as well. Therefore, this result accentuates the decrease in the estimated CAR's value. On the other hand, in the second, third and fourth simulations, since at least one of the terms is above the mean (positive), the result is also positive. In these three cases, the interaction term has a positive impact on the CAR's value and, hence, will increase the performance of the M&A.

This result brings the first finding in our study. Both the CSR score and CEO age give valuable results for the performance of an M&A individually. However, they should also be analysed together since they can have a considerable impact on the performance of an M&A. When both the CSR score and the CEO age are below their means, it could turn into a riskier deal in the perspective of the market, affecting negatively the performance of the company. The market could interpret that the company is not prepared for the deal in the way they have neither a sustainable perspective nor an experienced CEO. Both facts together deteriorate even more the performance of the company besides the effect of the standalone variables.

The above contributes to a deeper understanding of the interpretation of our model. The ideal CSR score that results in a successful M&A depends on the age of the CEO. For example, someone would expect that a lower CSR will harm the performance of the merger. However, when this score comes from an older CEO, the market will not react negatively. The market compensates the low CSR score and trust that the CEO's experience and intuition will lead to a successful acquisition. This interaction between the CEO age and the CSR score is a new term that has not been studied so far. It should be added to the existing literature as a significant variable that impacts the performance of the M&As.

H2: The performance of the M&As is higher when both the CEOs of the acquirer and target company belong to the group of the old age

In order to test H2, we first run a regression where the ages of the acquirer and target CEO are the main explanatory variables (Table 13.1). In the second regression, we added the interaction term[15] (Table 13.2). The results of the first regression (Table 13.1) indicate that the ages of the CEOs of the acquiring and target company are not statistically significant for the model. This is in contrast with the results of H1 where the age of the CEO of the acquiring company was statistically significant. The results indicate that when the target CEO age is added to the model, the acquirer's CEO age is not statistically significant. Also, the negative sign of the target's CEO age implies that the market prefers the CEO of the target company to be young. This is also in contrast with the market's preference to old CEOs from the acquiring company.

In the second regression, the interaction term was added, and the CEO age of the acquirer and the target did not have a significant change in terms of sign or statistical significance. However, the acquirer CEO age had an increased magnitude with a higher coefficient. According to Table 13.2, *the interaction term between the age of the acquirer and target CEOs* has a negative sign. This gives some valuable results for the market's behaviour. It indicates that when old CEOs acquire companies with old CEOs, there will be a negative impact on the performance of M&As. When both CEOs are old, the new consolidated company will be less flexible (Wiersema & Bantel, 1992) and more risk averse (Serfling, 2014). Both CEOs are closer to retirement and they are not expected to be concerned about their future career (DeChow and Sloan, 1991) and thus about the company's future. Therefore, the market invests in the acquisition when the CEO of the acquiring company is old, but it prefers it when the target CEO is young.

Furthermore, when both the acquiring and target CEO are old the CAR will decrease by 1.1 which makes the magnitude of this variable important. Nevertheless, the effect is not statistically significant, so based on this result, we should be sceptical that the interaction between the target and acquirer CEO age can impact the M&A performance. This is interpreted by the fact that the market is not worried about the target CEO age. If the acquiring company's CEO is older, the market will understand that the firm has the necessary experience for good integration.

[15] As described in Chapter 5, the interaction term is the combination of the acquirer and target CEOs who are older than 55 which is the median of the sample.

H3: The performance of the M&As is higher when CEOs of the group of old age acquire companies with high CSR

In order to test H3, we first run a regression where the CEO age of the acquiring company and the CSR score of the target company are the main explanatory variables (Table 14.1). In the second regression, we added the interaction term[16] (Table 14.2). In the third step (Table 14.3) we run a regression using the robust standard errors in the model. The results of the first regression (Table 14.1) are according to the expectations. The market has a positive reaction when the acquiring company's CEO is old. Moreover, the shareholders are more optimistic about acquisitions where the target has a higher CSR score. The high CSR score signals a target with high cultural values and more sustainable operations that will lead to a more efficient post-integration. Nevertheless, the CEO age of the acquiring company and the CSR score of the target company are not statistically significant for the model. This makes it difficult to make definitive conclusions about the investors' reactions to these variables.

When the interaction term is added in Table 14.2, the CEO age of the acquiring company becomes statistically significant and it also has increased magnitude. More particularly, when the CEO age increases by one year, the CAR will increase by 0.1. The sign, magnitude and statistical significance of the target's CSR score do not change after the inclusion of the interaction term. The sign of the coefficient of the *interaction between the CEO age of the acquiring company and the CSR score of the target* is negative. This implies that the market has a negative reaction when the CEO of the acquiring company is old and when the CSR score of the target is high. This is in contrast with the results of model 14.1 and it gives new valuable results for our conclusions. The market reacts positively when the acquirer CEO is old, and the target CSR score is high individually. Nevertheless, when both these variables are combined, the market has the opposite reaction. However, the interaction term is not statistically significant, so based on this result, we should be sceptical on how much it can impact the performance of the M&As.

Control Variables

Most of the control variables used in this study are not statistically significant as described in Table 4. Nevertheless, they are shortly analysed in this section for their economic significance and sign as an indication of future trends. Regarding the deal characteristics, the country and industry are statistically insignificant which can explain why previous literature is contradictory

[16] As described in Chapter 5, the interaction term is the combination of the age of CEO of the acquiring company and the CSR score of the target company.

on whether they have a positive or negative impact[17]. Also, this study refers to European countries with no big cultural differences.

The toehold is statistically significant. On the contrary to what expected, when the acquirer already holds at least 5% of the target, it harms the performance of the merger. This implies that acquirers with an established experience on the target's operations do not drive successful M&As. The method of payment is not statistically significant neither for stock nor for cash payment. However, the signs of the coefficients are following the expectations. Aligned with the Free Cash Flow theory, when the acquirer pays with cash, he/she signals that there is extra cash for the managers and thus space for empire building. This will result in lower performance of the merger. Also, the relative size is statistically significant and has a negative impact on the performance of the merger. This adds to the existing literature and clarifies that when the acquirer and the target don't have a similar size, it can lead to failure.

Surprisingly, the bidder's characteristics, do not show statistical significance to this study. The acquirer's size, leverage, Free Cash Flow and Market to Book value of Equity are not good indicators for the performance of an M&A. Although previous literature considers Tobin's q important for the performance of M&As, our results show that it is not statistically significant[18]. Finally, the tenure of the CEO is not statistically significant for our sample. This can be partly explained by the fact that our main explanatory variable of the age captures the tenure as well. The higher tenure implies that the CEO is also older and more experienced and therefore the CEO's acquisitions are more successful.

Furthermore, we conducted a test to understand if unobserved factors across the years and the industries have an impact on the dependent variable. We added the dummy variables for each year in the model for each study-Hypothesis discussed above (Table 11.5, 13.3, 14.5). The same was conducted using the dummies for each industry (Table 11.4 and 14.4). For both regressions, the coefficient of the main variables and the p-values remained almost the same.

The above results indicate that the acquirer's CSR score and CEO age individually and combined are enough to define whether the M&A will be successful or not. The control variables over the bidder's characteristics are statistically insignificant. However, this paper clarifies that there are two bidder's characteristics that are significant when analysing the performance of M&As. These are the CSR score and the CEO age of the acquiring company.

[17] For studies that examine the contradictory results of country and industry, see, for example, Doukas & Travlos (1998), Aktas et al. (2011), Chon et al., (2003), Nocke & Yeaple, (2007), Hijzen et al., (2008)

[18] For studies that examine the performance of M&As through Tobin's q, see, for example, Deng et al. (2013), Masulis et al. (2007)

We also validated our Hypothesis 1 using two other Event Window length: CAR [-1,+1] and CAR [-3,+3]. The results remained similar to the above discussions (Table 15-16).

7.3 Future Trends

A new trend is created where the bidder's most researched characteristics (i.e. size, leverage, Tobin's Q, free cash flow) are not statistically significant for the performance of M&As. Surprisingly, the target's characteristics are not statistically significant as well. The CSR of the target and the age of the target's CEO are not statistically significant for the performance of an M&A. The investors place all their trust on the acquirer's skills, and they believe that a more sustainable and experienced acquirer will, either way, have a successful M&A.

The above give space to new bidder characteristics that should be incorporated in future research. Such characteristics are analysed throughout this paper with the introduction of a combined variable that takes into account both the age of the CEO and the CSR score of the acquirer. In this point, we would like to turn the attention of future researchers to use generation ranges. They should focus on the impact of every generation on the performance of M&As. This is expected to be very important in the future since every generation includes CEOs with similar characteristics that distinguish them from other generations.

8. Conclusion

This final Chapter ties the purpose and the results of the paper together. We answer the research aims and questions through our results. We also discuss the contribution of this thesis and potential research that future studies can conduct.

8.1 Research Aims and Results

The trigger of this study was to explore how the combination of the CEO individual characteristics and the firm characteristics can impact the performance of M&As. A firm characteristic that impacts the M&A performance is sustainability (Aktas et al., 2011, Deng et al., 2013). An individual characteristic that impacts the M&A performance is the age of the CEO (Yim, 2013). However, the personal characteristics of the CEO can also affect the CSR score since the investment in sustainability relies on the managers' decisions (Huang, 2013). Therefore, we found the necessity of studying the performance of M&As through the combination of the CSR score and the CEO age. Except for this, we also attempted to address other questions that emerged during the study. The main research questions are summarized in the following questions:

Can the CSR score and the CEO age of the acquiring company affect the performance of the M&A?

Can the CEO age of the target and acquiring company affect the performance of the M&A?

Can the CEO age of the acquiring company together with the target CSR score affect the performance of the M&A?

One of the more significant findings to emerge from this study is the market's expectations from the acquiring company. This study has identified that the CEO age and the CSR score are important for the performance of M&As individually and combined. One could argue that a lower CSR score harms the M&A performance. However, when the low CSR score comes from a company where the CEO is old, there is no negative impact on the M&A performance[19]. These findings suggest that the market trust the old CEO's experience and compensates for the low performance on sustainability. This indicates a new trend where the shareholders seem to be

[19] As discussed in the previous Chapters the CEOs are divided in two different groups of age. The first one includes the young CEOs who are younger than 55 which is the mean age of the sample. The rest CEOs of the sample belong to the old group of age

more meticulous in their investments. Sustainability is an increasing trend and more firms invest in CSR. This makes the investors more sceptical. They don't take decisions based merely on the sustainability of the company. They also evaluate the personal skills of the CEOs.

The evidence from the second and third research questions provide insights for the target's individual and firm characteristics respectively. For the individual characteristics of the target, we used again the CEO age. The results were surprising since the market reacts negatively in M&As where the CEO of the target is old. This is in contrast with the previous results where the market prefers the acquiring companies with old CEOs. The investors seem to believe that when both the target and acquiring CEOs are old, they are less flexible, neglect their future career and thus the company's future. For the firm characteristics, we used the CSR score of the target. As expected, the market has a positive reaction when the CSR of the target company is high. The higher sustainability signals a target with higher cultural values and sustainable operations that will result in a more effective post-integration. Nevertheless, both the individual and firm characteristics of the target were not statistically significant and might not actually impact the performance.

8.2 Contribution and Practical Implications

The contribution of this study has been to investigate how the combination of the acquiring firm characteristics and CEO individual characteristics can impact the M&A performance. Until now, there was a research gap in the existing literature since there are no papers shedding light on this topic. These results add to the rapidly expanding field of M&As and argue that the M&A performance can be better analysed when we consider both the CSR score and the CEO age of the acquiring company. For practitioners, these results give valuable insights into the expectations of the investors. The CSR is not enough to explain the M&A performance. The over-investment in sustainability made the shareholders more sceptical. They also want to know the CEO's age and, hence, the CEO's experience and mentality.

Furthermore, the analysis of the target's characteristics undertaken here has extended our knowledge of how the market reacts in the target's skills as well. Both the target firm characteristics and the CEO individual characteristics do not seem important for the decision of the investors. There is a holistic behaviour where the market focuses on the characteristics that refer to the acquiring company. This can be explained by the fact that the target will have to fit in the acquiring company's culture after the acquisition. Therefore, the sustainability of the acquiring company and the age of the CEO are enough to ensure a successful M&A. The market invests in the acquirers with these two characteristics and they trust their decisions and M&A results.

8.3 Future Research

This study gives a fruitful area for further work. The same study should be repeated using the CSR score combined with more CEO characteristics in order to compare the results. Other CEO characteristics that can be combined with the CSR score are the tenure, the gender and the level of education. The different age influence people in a different way that define their mentality (Rhodes, 1983) and, hence, their corporate behaviour. Therefore, we consider the age as an umbrella term that captures all the other terms as well. This gives more holistic results which are appropriate for this study since it was not explored until this thesis. The more specific CEO demographics in future research will lead to a definitive understanding of the market perspective.

Furthermore, this research can be also conducted using the generation ranges. The sample of this study included 85% of Baby Boomers which would not lead to meaningful results when using the generations. For this reason, we used a group range where the CEOs were divided into older or younger than 55 years old[20]. Future researchers should use a longer period of time that will include the population from the other generations as well.

Another worth mentioning future research is to replicate the same study for CSR score and CEO age in the long-term perspective of the M&A performance improvement. The focus of this study is the short-term perspective by analysing the market expectations incorporated in the stock abnormal returns around the event day. Deng et al. (2019) executed a long-term view by capturing the operating performance post-merger, comparing merged firms with a control group of non-merged firms. Future researches that use Deng et al (2019) approach and the suggestions contributed by this paper will add to the existing literature.

[20] As mentioned in the previous Chapters, 55 is the mean of the CEO age in the sample.

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Tables

Table 1 Event Window used in the past researches

Authors	Subject	Event Window	Estimation Window	Market Index
Aktas et al. (2011)	M&As and CSR	(-1, +1)	(-10, -250)	Local Market Index per country
Deng et al. (2013)	M&As and CSR	(-1, +1) (-2, +2) (-5, +5)	(-11, -200) trading days	S&P 500 (the study of US market)
Meckl & Theuerkorn (2015)	M&As and CSR	(-5, +5) (-20, +20)	(-230)	No information
Bereskin et al. (2018)	M&As and CSR	(-3, +3)	(-46, -300)	CRSP value-weighted return

Table 2 Summary table non-dummies variables

Table that includes the summary of the non-dummy variables included in the sample. The mean, minimum and maximum numbers seem in conformity with the reality and make the sample reliable.

	Mean	Median	Standard Deviation	Minimum	Maximum
Car2	0,13%	0,4%	3,9%	-19%	14%
Age_CEO_acquirer	55,16	55	6,4	41	75
CSR_acquirer	53,0%	48,9%	15,0%	19,5%	89,8%
Age_CEO_target	54,1	55	5,6	42	66
CSR_target	51,13	47,35	14,0	19,83	86,51
Relative_size	18,1%	2,1%	50,0%	0	545,2%
Tobinq_acquirer	1,54	1,33	0,94	0	9,45
Leverage_acquirer	24,7	23	13,7	0	62
FCF	83,8	2,9	278,9	-808	993
MB	9,6	1,8	108,4	0,06	1909
Tenure	5,74	4,75	4,8	0,25	40

Table 3 Definition of main variables

Table with the definitions of the main explanatory variables used in the model. It also includes the names of these variables that were coded for the regressions in Stata.

Variable	**Definition**	**Name in regression**
Acquirer's CEO age	Age of the CEO the year of the announcement of the acquisition.	Age_CEO_Acquirer
Acquirer's CSR score	ESG Combined score of the acquirer	CSR_Acquirer
Target's CEO age	Age of the CEO the year of the announcement of the acquisition	Age_CEO_target
Target's CSR score	ESG Combined score of the target	CSR_target
Interaction of age and CSR score	(CSR of the Acquirer- mean CSR of the Acquirer)*(Age of the Acquirer-mean age of the Acquirer)	Age_CSR_mean
Interaction term between acquirer and target age	Dummy variable of the age of target CEO multiplied by the dummy variable of the acquirer's CEO age (1: where the acquirer CEO is older than 55 / 0: when younger)	old_old
Interaction term between target CSR score and acquirer CEO age	Dummy CSR score of the target (1: CSR score higher than 47/ 0: when lower) multiplied by the dummy variable of old acquirer (1: where the acquirer CEO is older than 55/ 0:when younger)	old_acquirer_high_CSR_target

Table 4 Definition of control variables

Table with the definitions of the control variables used in the model, their names in the regression tables and their statistical significance. The table also includes the expected sign of the variables according to the existing literature and the sign that resulted in our regressions.

Deal Characteristics

Variable	Definition	Name in regression	Significant	Expected sign	Found sign
Country (dummy)	1: Same country for acquirer and target company, 0: different countries.	Country	No	(+/-)	(-)
Industry (dummy)	1: Both acquirer and target companies have the same business industry according to the two first digits of their SIC code, 0: different ones.	Industry	No	(+/-)	(+)
Relative Size	Total assets of target/Total assets of acquirer	Relative_size	Yes	(+/-)	(-)
Cash (dummy)	1: cash, 0: other methods	Cash	No	(-)	(-)
Stock (dummy)	1: stock, 0: other methods of payment	Stock	No	(+)	(+)
Toehold (dummy)	1: the acquirer holds at least 5% before the merger, 0: otherwise	Toehold	Yes	(+)	(-)

Bidder Characteristics

Variable	Definition	Name in regression	Significant	Expected sign	Found sign
Acquirer Size	log (book value of total assets)	lacquirer_size	No	(-)	(+)
Leverage	Book value of debt/Market value of assets	Leverage_acquirer	No	(+)	(+)
Tobin's Q	Market value of assets/book value of assets (log)	ltobinsq	No	(+/-)	(-)
Free Cash Flow	Operating Income before depreciation - income expenses -income taxes - capital expenditures, scaled by the number of shares	FCF	No	(-)	(-)
Market to Book Value	Market value of equity/Book value of equity	MB	No	(-)	(+)
CEO tenure	Length of time that the CEO has been at the helm of the company	Tenure	No	(+)	(+)

Table 5 Summary Information per Country and Industry

The table presents the amount of M&As, the year with the more M&As, the year with the fewer M&As and the industry with the more M&As for each country in our sample.

Country	Total Acquisitions	Year with more acquisitions	Year with less acquisitions	Industry with more Acquisitions
GB	81	2012	2018	Manufacturing
FR	72	2011	2015	Finance, Insurance and Real Estate
DE	29	2012	2016	Machinery, equipment, furniture, recycling
CH	27	2008	2013	Chemicals, rubber, plastics, non-metallic products
SE	23	2012	2016	Machinery, equipment, furniture, recycling
NL	21	2016	2017	Machinery, equipment, furniture, recycling
ES	11	2011	2014	Banks
IE	11	2016	2007	Chemicals, rubber, plastics, non-metallic products
IT	10	2015	2017	Banks
FI	8	2008	2016	Machinery, equipment, furniture, recycling
LU	6	2007	2009	Metals & metal products
AT	4	2015	2015	Insurance companies
BE	3	2015	2015	Chemicals, rubber, plastics, non-metallic products
DK	3	2015	2013	Machinery, equipment, furniture, recycling
NO	3	2011	2012	Banks
PL	3	2013	2016	Banks
PT	1	2013	2013	Banks
Total	**315**			

Table 6 Correlation Matrix

The Correlation Matrix below shows that there is no perfect correlation between the variables, which fulfills the multicollinearity assumption.

	Car2	*Age CEO acquirer*	*CSR acquirer*	*Age CEO target*	*CSR target*	*Relative size*	*Acquirer size*	*Tobinq acquirer*	*Leverage acquirer*	*FCF*	*MB*	*Tenure*	*Age CSR mean*
Car2	1,000												
Age_CEO_acquirer	0,140	1,000											
CSR_acquirer	0,148	0,072	1,000										
Age_CEO_target	-0,146	0,285	-0,040	1,000									
CSR_target	0,079	0,050	0,766	-0,026	1,000								
Relative_size	-0,118	-0,059	0,060	0,008	-0,025	1,000							
Acquirer_size	0,081	0,101	-0,040	-0,338	-0,101	-0,111	1,000						
Tobinq_acquirer	-0,065	-0,150	0,014	0,053	-0,024	0,096	-0,233	1,000					
Leverage_acquirer	0,004	-0,041	0,050	-0,093	0,143	-0,057	0,012	-0,067	1,000				
FCF	0,010	0,015	-0,006	0,192	0,074	0,018	-0,010	0,032	0,000	1,000			
MB	0,028	0,057	-0,058	0,162	-0,101	-0,021	-0,002	-0,018	-0,094	0,154	1,000		
Tenure	0,095	0,188	0,126	-0,102	0,085	0,021	-0,079	0,136	-0,005	-0,045	-0,071	1,000	
Age_CSR_mean	-0,144	-0,220	-0,020	-0,082	0,016	0,079	-0,160	0,106	-0,016	-0,034	-0,061	0,032	1,000

Table 7 Breusch-Pagan and White test for Hypothesis 1

The Breusch-Pagan and White tests are conducted in Stata through tools “estat hettest” and “estat imtest, white”, respectively. Since the p-value is lower than 5%, we reject the null Hypothesis that the variance of the error term is not constant in both tests.

Breusch-Pagan for heteroscedasticity		**White's test**	
H0: Constant Variance		H0: homocedasticity	
chi2 (1)	16,95	chi2 (129)	164,58
Prob > chi2	0,0000	Prob > chi2	0,0188

Table 8 Breusch-Pagan and White test for Hypothesis 2

The Breusch-Pagan and White tests are conducted in Stata through tools “estat hettest” and “estat imtest, white”, respectively. Since the p-value is higher than 5%, we reject the null Hypothesis that the variance of the error term is constant in both tests.

Breusch-Pagan for heteroscedasticity		**White's test**	
H0: Constant Variance		H0: homocedasticity	
chi2 (1)	2,43	chi2 (129)	31
Prob > chi2	0,1188	Prob > chi2	0,4154

Table 9 Breusch-Pagan and White test for Hypothesis 3

The Breusch-Pagan and White tests are conducted in Stata through tools “estat hettest” and “estat imtest, white”, respectively. Since the p-value is lower than 5%, we reject the null Hypothesis that the variance of the error term is constant in both tests.

Breusch-Pagan for heteroscedasticity		**White's test**	
H0: Constant Variance		H0: homocedasticity	
chi2 (1)	2,43	chi2 (129)	31
Prob > chi2	0,1188	Prob > chi2	0,4154

Table 10 Summary Table with the Hypotheses

The first Hypothesis gave statistically significant results whereas the second and third resulted in non-statistical results.

Hypothesis tested	**Results**	**Comment**
H1: The performance of the M&As is affected by the CEO age and the CSR score of the acquiring company	✔	The interaction of the CEO age and CSR score of the acquiring company is statistically significant
H2: The performance of the M&As is higher when both the CEOs of the acquiring and target company belong to the group of the old age	✘	The interaction of the old acquiring CEO and old target CEO is not statistically significant
H3: The performance of the M&As is higher when CEOs of the group of old age acquire companies with high CSR	✘	The interaction of the old acquiring CEO and high CSR score of the target is not statistically significant

Table 11 Regression Hypothesis 1

The regression (1) refers to the equation model where CAR [-2,+2] is the dependent variable and the CEO age and CSR score of the acquiring company are the main explanatory variables. We also added the control variables in this model; (2) refers the previous equation but adding the interaction term between CEO age and CSR score deducted to their means[21]; (3) refers to the previous equation, but using the robust standard errors; (4) refers the previous equation but controlling for the industries; (5) refers to equation 3 but controlling for the years.

Regression Descriptions	(1) Model with the main and control variables	(2) Model with the main, control variables and interaction term	(3) Model with the main, control variables and interaction term (robust)	(4) Industry Control	(5) Year Control
Variables (Horizontal: Dependent/ Vertical: Indepedent)	car2	car2	car2	car2	car2
Age_CEO_acquirer	0.0731**	0.0587	0.0587*	0.0237	0.0565
	(0.0362)	(0.0367)	(0.0345)	(0.0430)	(0.0355)
CSR_acquirer	0.0353**	0.0344**	0.0344**	0.0424**	0.0399***
	(0.0149)	(0.0149)	(0.0133)	(0.0165)	(0.0131)
age_CSR_mean		-0.00488**	-0.00488**	-0.00366	-0.00500**
		(0.00243)	(0.00223)	(0.00246)	(0.00223)
Country	-0.387	-0.276	-0.276	-0.404	-0.336
	(0.509)	(0.510)	(0.493)	(0.553)	(0.514)
Industry	0.707	0.666	0.666	1.064	0.577
	(0.603)	(0.601)	(0.600)	(0.678)	(0.770)
Relative_size	-0.00931**	-0.00887**	-0.00887	-0.00812	-0.00826
	(0.00448)	(0.00446)	(0.00566)	(0.00625)	(0.00582)
Cash	-0.769	-0.801	-0.801	-0.827	-0.731
	(0.520)	(0.517)	(0.509)	(0.563)	(0.517)
Stock	0.306	0.312	0.312	0.744	0.239
	(0.825)	(0.821)	(0.824)	(0.817)	(0.840)
Toehold	-0.888*	-0.959*	-0.959**	-1.131**	-0.723
	(0.519)	(0.518)	(0.453)	(0.574)	(0.500)
Leverage_acquirer	0.00420	0.00377	0.00377	-0.0167	0.00397
	(0.0164)	(0.0163)	(0.0163)	(0.0209)	(0.0161)
FCF	-4.32e-06	-4.51e-05	-4.51e-05	-0.000584	5.42e-05
	(0.000796)	(0.000792)	(0.000786)	(0.000966)	(0.000799)
MB	0.00155	0.00131	0.00131*	0.00210**	0.00147
	(0.00210)	(0.00209)	(0.000785)	(0.000885)	(0.00100)
Tenure	0.0629	0.0670	0.0670	0.0586	0.0597
	(0.0488)	(0.0486)	(0.0496)	(0.0567)	(0.0499)
ltobinsq	-0.309	-0.313	-0.313	-0.304	-0.341
	(0.301)	(0.299)	(0.211)	(0.243)	(0.214)
lacquirer_size	0.0973	0.0847	0.0847	0.165	0.0484
	(0.134)	(0.133)	(0.140)	(0.192)	(0.141)
Constant	-7.558**	-6.446**	-6.446*	2.729	-6.093*
	(3.000)	(3.036)	(3.391)	(3.633)	(3.485)
Robust	NO	NO	YES	YES	YES
Industry Control	NO	NO	NO	YES	NO
Year Control	NO	NO	NO	NO	YES
Observations	315	315	315	315	315
R-squared	0.082	0.094	0.094	0.221	0.119

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

[21] The interaction term Age_CSR_Mean is expressed by (Age_CEO_acquirer - 55)*(CSR_Score - 53), where 55 is the mean of the age of the acquiring CEO and 53 is the mean of the CSR score of the acquiring company.

Table 12 Simulations for the interaction term between CSR and CEO age

This Table aims to analyse the interaction sign that derives from different CEO ages and CSR scores. There are four different simulations with all the potential cases where the CSR score and CEO age are higher or lower than the mean values. The only case where the coefficient of the interaction term (Age_CSR_Mean) will be negative is when both the CSR score and CEO are below their means.

Simulation CSR/CEO's age	Values	Distance to the mean	Interaction: CSR acquirer*CEO's age	Interaction sign
1: Negative/Negative	CSR = 52 CEO age = 54	ΔCSR = 52- 53= -1 ΔCEO's age = 54 -55= -1	= -0,005*-1*-1 = -0,005	Negative
2: Positive/Negative	CSR = 54 CEO age = 54	ΔCSR = 54- 53= +1 ΔCEO's age = 54 -55= -1	= -0,005*+1*-1 = +0,005	Positive
3: Negative/Positive	CSR = 52 CEO age = 56	ΔCSR = 52- 53= -1 ΔCEO's age = 56 -55= +1	= -0,005*-1*+1 = +0,005	Positive
4:Positive/Positive	CSR = 54 CEO age = 56	ΔCSR = 54- 53= +1 ΔCEO's age = 56 -55= +1	= -0,005*+1*+1 = +0,005	Positive

Table 13 Regression Hypothesis 2

The regression (1) refers to the equation model where CAR [-2,+2] is the dependent variable and the CEO age of both the acquirer and the target are the main explanatory variables. We also added the control variables in this model; (2) refers to the previous equation but adding the interaction term between dummy variables of the old/young group of ages for both the acquirer and the target company[22]; (3) refers to the previous equation but controlling by year.

	(1)	(2)	(3)
Regression Descriptions	Model with the main and control variables	Model with the main, control variables and interaction term	Year Control
Variables (Horizontal: Dependent/ Vertical: Indepedent)	car2	car2	Car1
Age_CEO_acquirer	0.0495	0.114	-0.132
	(0.198)	(0.296)	(0.440)
Age_CEO_target	-0.166	-0.132	-0.0667
	(0.170)	(0.208)	(0.294)
old_old		-1.108	-2.876
		(3.648)	(5.924)
Country	-4.614*	-4.390*	-4.192
	(2.204)	(2.386)	(2.370)
Industry	0.290	0.180	7.113
	(2.765)	(2.870)	(6.393)
Relative_size	-0.00619	-0.00610	-0.0255
	(0.0255)	(0.0263)	(0.0358)
Cash	-3.546	-3.579	-2.963
	(2.559)	(2.637)	(7.000)
Stock	5.108*	5.120*	2.528
	(2.780)	(2.862)	(3.169)
Toehold	-2.688	-2.949	-4.294
	(3.682)	(3.888)	(7.350)
Leverage_acquirer	0.0207	0.0325	-0.0687
	(0.0785)	(0.0896)	(0.217)
FCF	-0.00346	-0.00371	-0.00441
	(0.00295)	(0.00315)	(0.00441)
MB	-0.108	-0.0495	-0.0117
	(0.467)	(0.518)	(0.773)
Tenure	0.0930	0.115	0.0486
	(0.253)	(0.271)	(0.475)
ltobinsq	-0.937	-1.109	-2.015
	(1.752)	(1.891)	(1.093)
lacquirer_size	1.089	1.094	1.981
	(1.169)	(1.204)	(2.452)
Constant	-9.558	-15.24	-31.66
	(24.95)	(31.78)	(55.27)
Robust	NO	NO	NO
Year Control	NO	NO	NO
Observations	31	31	31
R-squared	0.459	0.462	0.840
Standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

[22] The interaction term *old_old* is expressed by Dummy_Age_CEO_target*Dummy_Age_CEO_acquirer, where it contains "one" when the acquiring CEO is older than the 55 (mean) and "zero" when younger.

Table 14 Regression Hypothesis 3

The regression (1) refers to the equation model where CAR [-2,+2] is the dependent variable and the CEO age of the acquirer and the CSR score of the target are the main explanatory variables. We also added the control variables in this model; (2) refers the previous equation but adding the interaction term between dummy variables of the old/young group of ages of the acquirer and the dummy variable of high/low CSR score of the target company[23]; (3) refers to the previous equation, but using the robust standard errors; (4) refers the previous equation but controlling for the industries; (5) refers to equation 3 but controlling for the years.

	(1)	(2)	(3)	(4)	(5)
Regression Descriptions	Model with the main and control variables	Model with the main, control variables and interaction term	Model with the main, control variables and interaction term (robust)	Industry Control	Year Control
Variables (Horizontal: Dependent/ Vertical: Indepedent)	car2	car2	car2	car2	car2
Age_CEO_acquirer	0.0865	0.141*	0.141	0.0736	0.138
	(0.0629)	(0.0778)	(0.0876)	(0.0915)	(0.0961)
CSR_target	0.0218	0.0351	0.0351	0.0464	0.0344
	(0.0257)	(0.0280)	(0.0290)	(0.0297)	(0.0363)
old_acquirer_high_CSR_target		-1.205	-1.205	-1.385	-1.039
		(1.011)	(0.994)	(1.089)	(1.062)
Country	-1.091	-1.209	-1.209	-1.561	-1.418
	(0.817)	(0.822)	(0.784)	(1.121)	(0.914)
Industry	-0.0721	-0.0366	-0.0366	0.339	0.819
	(0.910)	(0.909)	(0.813)	(0.894)	(1.050)
Relative_size	-0.00766	-0.00685	-0.00685	-0.00373	-0.00551
	(0.00842)	(0.00843)	(0.00854)	(0.0107)	(0.00929)
Cash	-0.863	-0.844	-0.844	-2.294**	-1.063
	(0.868)	(0.867)	(0.841)	(1.044)	(0.909)
Stock	0.902	0.914	0.914	2.944**	0.512
	(1.230)	(1.228)	(1.224)	(1.475)	(1.274)
Toehold	-1.292	-1.303	-1.303	-1.291	-1.453
	(0.875)	(0.873)	(0.794)	(1.215)	(0.927)
Leverage_acquirer	0.0391	0.0389	0.0389*	0.00642	0.0435
	(0.0294)	(0.0293)	(0.0220)	(0.0284)	(0.0271)
FCF	-0.000449	-0.000564	-0.000564	-0.00325**	-0.00105
	(0.00123)	(0.00123)	(0.00110)	(0.00133)	(0.00107)
MB	0.00136	0.00109	0.00109	0.00294**	0.000600
	(0.00224)	(0.00225)	(0.000955)	(0.00114)	(0.000968)
Tenure	0.0173	0.00227	0.00227	-0.00188	0.0105
	(0.0702)	(0.0712)	(0.0631)	(0.0570)	(0.0676)
ltobinsq	-0.319	-0.339	-0.339	-0.346	-0.373
	(0.447)	(0.446)	(0.454)	(0.556)	(0.507)
lacquirer_size	0.167	0.151	0.151	0.325	0.123
	(0.203)	(0.203)	(0.227)	(0.358)	(0.233)
Constant	-8.383*	-11.32**	-11.32	-0.733	-11.27
	(4.380)	(5.020)	(7.460)	(7.674)	(7.936)
Robust	NO	NO	YES	YES	YES
Industry Control	NO	NO	NO	YES	NO
Year Control	NO	NO	NO	NO	YES
Observations	133	133	133	133	133
R-squared	0.101	0.112	0.112	0.495	0.152
Standard errors in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

[23] The interaction term *old_acquirer_high_CSR_target* is expressed by Dummy_Age_CEO_acquirer*Dummy_CSR_target. Dummy_CSR_target is equal to "one" when the CSR score of the target is higher than 47 (mean) and "zero" when lower. Dummy_Age_CEO_acquirer contains "one" when the acquirer CEO is older than the 55 (mean) and "zero" when younger.

Table 15 Hypothesis 1 with CAR [-3,+3] simulation

The purpose of running these regressions using the CARs with different length of Event Window as the dependent variable is to check whether the results are consistent to the result when using CAR [-2,+2] as the dependent variable. This table shows that both results are similar.
The regression (1) refers to the equation model where CAR [-3,+3] is the dependent variable and CEO age and CSR score of the acquiring company are the main explanatory variables. We also added the control variables in this model; (2) refers to the previous equation but adding the interaction term between CEO age and CSR score deducted to their means[24]; (3) refers to the previous equation, but using the robust standard errors; (4) refers the previous equation but controlling for the industries; (5) refers to equation 3 but controlling for the years.

	(1)	(2)	(3)	(4)	(5)
Regression Descriptions	Model with the main and control variables	Model with the main, control variables and interaction term	Model with the main, control variables and interaction term (robust)	Industry Control	Year Control
Variables (Horizontal: Dependent/ Vertical: Indepedent)	car3	car3	car3	car3	car3
Age_CEO_acquirer	0.0457	0.0317	0.0317	-0.0222	0.0298
	(0.0400)	(0.0407)	(0.0401)	(0.0477)	(0.0413)
CSR_acquirer	0.0408**	0.0399**	0.0399***	0.0531***	0.0483***
	(0.0165)	(0.0165)	(0.0148)	(0.0183)	(0.0148)
age_CSR_mean		-0.00473*	-0.00473*	-0.00311	-0.00474*
		(0.00269)	(0.00242)	(0.00258)	(0.00245)
Country	-0.424	-0.316	-0.316	-0.359	-0.434
	(0.564)	(0.565)	(0.557)	(0.607)	(0.589)
Industry	0.782	0.743	0.743	0.731	0.553
	(0.668)	(0.666)	(0.635)	(0.754)	(0.801)
Relative_size	-0.00962*	-0.00919*	-0.00919	-0.00804	-0.00906
	(0.00495)	(0.00494)	(0.00622)	(0.00635)	(0.00597)
Cash	-0.943	-0.974*	-0.974*	-0.893	-0.898
	(0.575)	(0.573)	(0.583)	(0.654)	(0.581)
Stock	-0.343	-0.338	-0.338	-0.0591	-0.596
	(0.912)	(0.909)	(0.923)	(0.987)	(0.931)
Toehold	-0.738	-0.807	-0.807	-0.854	-0.489
	(0.575)	(0.574)	(0.590)	(0.768)	(0.648)
Leverage_acquirer	0.0113	0.0109	0.0109	-0.00109	0.0106
	(0.0182)	(0.0181)	(0.0187)	(0.0238)	(0.0185)
FCF	0.000547	0.000508	0.000508	0.000471	0.000644
	(0.000880)	(0.000877)	(0.000954)	(0.00113)	(0.000961)
MB	0.00223	0.00200	0.00200**	0.00263***	0.00229**
	(0.00232)	(0.00231)	(0.000782)	(0.000970)	(0.000953)
Tenure	0.0868	0.0908*	0.0908*	0.0872	0.0871*
	(0.0540)	(0.0539)	(0.0496)	(0.0581)	(0.0490)
ltobinsq	-0.346	-0.350	-0.350	-0.369	-0.379
	(0.333)	(0.331)	(0.234)	(0.288)	(0.232)
lacquirer_size	-0.0319	-0.0441	-0.0441	0.0622	-0.105
	(0.148)	(0.148)	(0.152)	(0.221)	(0.161)
Constant	-4.237	-3.160	-3.160	5.610	-2.749
	(3.319)	(3.364)	(3.475)	(3.959)	(3.815)
Robust	NO	NO	YES	YES	YES
Industry Control	NO	NO	NO	YES	NO
Year Control	NO	NO	NO	NO	YES
Observations	315	315	315	315	315
R-squared	0.081	0.090	0.090	0.213	0.137

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

[24] The interaction term Age_CSR_Mean is expressed by [(Age_CEO_acquirer - 55)*(CSR_Score - 53)], where 55 is the mean of the age of the acquiring CEO and 53 is the mean of the CSR score of the acquiring company.

Table 16 Hypothesis 1 with CAR [-1,+1] simulation

The purpose of running these regressions using the CARs with different length of Event Window as the dependent variable is to check whether the results are consistent to the result when using CAR [-2,+2] as the dependent variable. This table shows that both results are similar.
The regression (1) refers to the equation model where CAR [-1,+1] is the dependent variable and CEO age and CSR score of the acquiring company are the main explanatory variables. We also added the control variables in this model; (2) refers to the previous equation but adding the interaction term between CEO age and CSR score deducted to their means[25]; (3) refers to the previous equation, but using the robust standard errors; (4) refers to the previous equation but controlling for the industries; (5) refers to equation 3 but controlling for the years.

	(1)	(2)	(3)	(4)	(5)
Regression Descriptions	Model with the main and control variables	Model with the main, control variables and interaction term	Model with the main, control variables and interaction term (robust)	Industry Control	Year Control
Variables (Horizontal: Dependent/ Vertical: Indepedent)	Car1	Car1	Car1	Car1	Car1
Age_CEO_acquirer	0.0560	0.0437	0.0437	0.0209	0.0417
	(0.0352)	(0.0357)	(0.0330)	(0.0404)	(0.0337)
CSR_acquirer	0.0269*	0.0261*	0.0261*	0.0333**	0.0309**
	(0.0145)	(0.0145)	(0.0134)	(0.0163)	(0.0129)
age_CSR_mean		-0.00414*	-0.00414*	-0.00278	-0.00419*
		(0.00236)	(0.00233)	(0.00244)	(0.00230)
Country	-0.201	-0.107	-0.107	-0.392	-0.212
	(0.495)	(0.496)	(0.462)	(0.499)	(0.470)
Industry	0.652	0.618	0.618	0.986	0.459
	(0.586)	(0.585)	(0.596)	(0.645)	(0.797)
Relative_size	-0.00642	-0.00604	-0.00604	-0.00539	-0.00565
	(0.00435)	(0.00434)	(0.00529)	(0.00562)	(0.00532)
Cash	-0.615	-0.642	-0.642	-0.796	-0.554
	(0.505)	(0.504)	(0.497)	(0.542)	(0.505)
Stock	-0.0314	-0.0268	-0.0268	0.553	-0.0793
	(0.801)	(0.799)	(0.794)	(0.831)	(0.798)
Toehold	-0.641	-0.701	-0.701*	-0.792	-0.426
	(0.505)	(0.504)	(0.410)	(0.508)	(0.447)
Leverage_acquirer	0.00170	0.00133	0.00133	-0.0205	0.00237
	(0.0160)	(0.0159)	(0.0173)	(0.0210)	(0.0173)
FCF	-0.000159	-0.000194	-0.000194	-0.000658	-0.000130
	(0.000773)	(0.000771)	(0.000672)	(0.000825)	(0.000674)
MB	0.00194	0.00173	0.00173**	0.00237***	0.00193**
	(0.00204)	(0.00203)	(0.000674)	(0.000888)	(0.000972)
Tenure	0.0795*	0.0830*	0.0830	0.0623	0.0768
	(0.0474)	(0.0473)	(0.0531)	(0.0578)	(0.0528)
ltobinsq	-0.274	-0.277	-0.277	-0.180	-0.311
	(0.292)	(0.291)	(0.204)	(0.235)	(0.204)
lacquirer_size	0.0555	0.0448	0.0448	0.0876	-0.000600
	(0.130)	(0.130)	(0.142)	(0.182)	(0.138)
Constant	-5.719*	-4.776	-4.776	3.683	-4.188
	(2.915)	(2.955)	(3.502)	(3.483)	(3.520)
Robust	NO	NO	YES	YES	YES
Industry Control	NO	NO	NO	YES	NO
Year Control	NO	NO	NO	NO	YES
Observations	315	315	315	315	315
R-squared	0.061	0.070	0.070	0.216	0.097

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

[25] The interaction term Age_CSR_Mean is expressed by (Age_CEO_acquirer - 55)*(CSR_Score - 53), where 55 is the mean of the age of the acquiring CEO and 53 is the mean of the CSR score of the acquiring company.

Appendices

Appendix A Summary of existing relevant literature

Table that includes the previous literature that is related to the main topic of this study. This table includes the size, the period and the place of the sample. It also includes the Event Windows used by the authors and the summary of their results

Authors	Subject	Period	Country	Sample Size	Event Window	Results
Aktas et al. (2011)	M&As and CSR	1997 - 2007	Global	106	(-1, +1)	-The stock market awards the acquirer for making socially and environmentally responsible investments. -After the acquisitions of a target with high investment in sustainability, the acquirer's environmental and social performance increases.
Deng et al. (2013)	M&As and CSR	1992 - 2007	US	1,556	(-1, +1) (-2, +2) (-5, +5)	-Acquirers with higher CSR have higher merger announcement returns in the short-term. -The market does not measure the impact of the CSR immediately since there is an increase in the long-term operating performance. - Mergers with acquirers with higher CSR take less time to complete
Yim (2013)	M&As and age	1992 - 2007	S&P 1500 index	1500	n.a	-A firm with a CEO who is 20 years older is 30% less likely to announce an acquisition. - CEOs with longer tenure are more likely to have successful M&As
Meckl & Theuerkorn (2015)	M&As and CSR	2006 - 2010	US & Germany	113	(-5, +5) (-20, +20)	-The high engagement in CSR can be value-destroying for the M&A. -The high environmental engagement implies higher costs during the M&A transactions and this can lead to failure of the M&A
Bereskin et al. (2018)	M&As and CSR	1994 - 2014	US	570	(-3, +3)	-Organizations with similar cultures are more likely to merge. -Mergers with similar cultures have more successful post-integration and higher long-term operating performance.

Appendix B ESG score decomposition

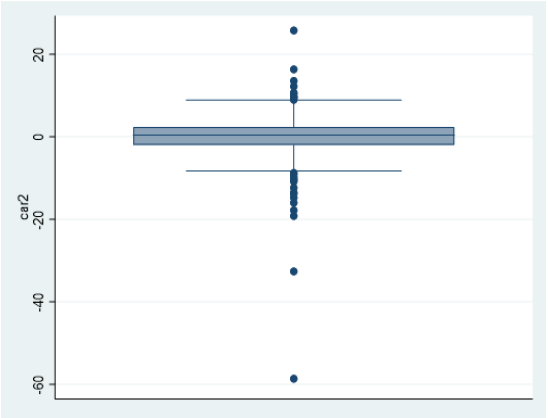
Table with the definitions of the different ESG scores as well as the decomposition in ten subcategories. This study uses the ESG combined score which is the most appropriate since it includes both the self-score and the score that derives from the media events.

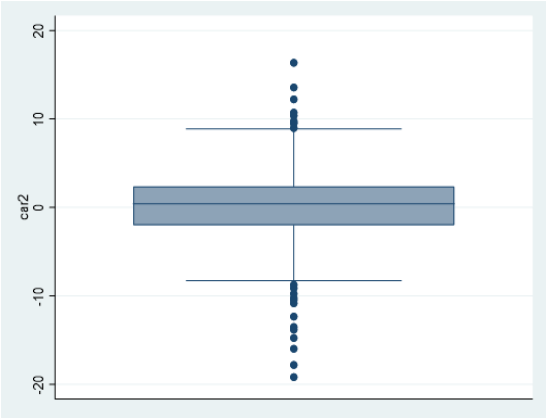
Score Name	**Definition**
ESG Combined Score ***(used)***	Environmental, social and corporate governance pillars (ESG self- score) with an ESG Controversies overlay (reflect the negative events reported in global media).
ESG score	Overall company score based on the self-reported information in the environmental, social and corporate governance pillars.
ESG controversies score	It measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media.
Resource Use Score	Performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
Emissions Score	Commitment to and effectiveness in reducing environmental emissions in the production and operational processes.
Environmental Innovation Score	Reduce the environmental costs and burdens for its customers
Management Score	Commitment to and effectiveness in following best practice corporate governance principles.
Shareholders Score	Effectiveness in the equal treatment of shareholders and the use of anti-takeover devices.
CSR Strategy Score	Incorporates the economic (financial), social and environmental dimensions in its day-to-day decision-making processes.
Workforce Score	Effectiveness towards job satisfaction, healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
Human Rights Score	Effectiveness in respecting the fundamental human rights conventions.
Community Score	Commitment to be a good citizen, protecting public health and respecting business ethics.
Product Responsibility Score	Capacity to produce quality goods and services, incorporating the customer's health and safety, integrity and data privacy.

Source: Thomson Reuters, ESG score 2018

Appendix C BoxPlot of CAR [-2,2]

Box Plot of our dependent variable Cumulative Abnormal Returns calculated using the Market Model. The estimation window was two hundred trading days to eleven trading days before the event day. The Event Window is two days before to two days after the announcement day. The left graph shows the Box Plot before removing three outliers of our sample. The range considered was from +20% to +20%. The right graph shows the Box Plot after removing them.





Appendix D Variables used by previous research

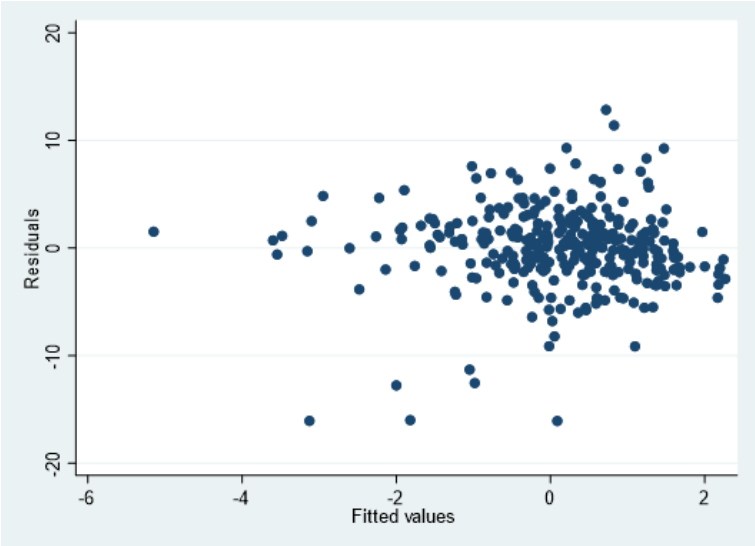
Table that includes the variables used by the previous literature analysing the performance of M&As. They are also used in the regressions of this paper. However, some of the above variables were not statistically significant throughout our tests. These are the gray ones.

Type of variable	**Variable**	**Literature that used this variable**
Dependent Variable	(CAR)	*Aktas et al., (2011), Deng et al. (2013), Meckl & Theuerkorn (2015), Bereskin et al. (2018)*
Explanatory Variable	ESG combined score	
	Age of the CEOs	*Huang (2013), Yim (2013)*
	Country	*Aktas et al., (2011)*
	Industry	*Aktas et al., (2011), Deng et al. (2013), Bereskin et al. (2018)*

Control Variables	Relative size	*Aktas et al., (2011), Deng et al. (2013), Bereskin et al. (2018)*
	Cash	*Aktas et al., (2011), Deng et al. (2013), Bereskin et al. (2018)*
	Stock	*Deng et al. (2013)*
	Toehold	*Deng et al. (2013)*
	Tobin's Q	*Deng et al. (2013)*
	Firm size	*Deng et al. (2013), Bereskin et al. (2018)*
	Leverage	*Deng et al. (2013), Bereskin et al. (2018)*
	Free Cash Flow	*Deng et al. (2013)*
	Market to Book Value of Equity	*Deng et al. (2013), Bereskin et al. (2018)*
	Tenure of the CEO	*Yim (2013), Huang (2013)*

Appendix E Scatter Graph of residuals and explanatory variable

Scatter graph of the explanatory variable with the residuals. Since the dots are spread out in the graph, the variance of the variable is not homogenous.



Appendix F Normality Test

From the graph below the residuals seem to behave in a Normal pattern, which makes the Normality assumption reasonable to use the inference analysis.