ERASMUS UNIVERSITY ROTTERDAM
Erasmus School of Economics
Master Thesis [Financial Economics]

The impact of M&As on the Financial performance and ESG performance of acquiring firms

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Date final version: 07-07-2023

Abstract

This thesis aims to examine the impact of M&A deals, taken place in 2017, on the financial performance and the sustainability performance[1] of listed acquiring firms in the United States. By conducting fixed-effect panel regressions based on a sample of 311 acquiring firms, the results showed that there is a significant negative relationship between M&A deals and the long-term financial performance of acquiring firms in the United States, but at the same time these deals seem to increase the shareholder's value as the Earnings per Share increased. However, the findings suggest that this impact on the financial performance did not vary depending on whether the M&A deal was cross-border or domestic. Additionally, the M&A impact on the acquiring firm's financial performance reveals industry heterogeneity since financial performance significantly differs across industry divisions.

Moreover, based on a sample of 134 firms this research showed that M&A deals have a significant positive impact on the ESG (Environmental, Social and Governance) performance of acquiring firms in the United States, however this positive impact weakens as the size of the firms increases.

Acknowledgements

I would like to express my heartfelt gratitude to my master thesis supervisor Dr. Giovanni Cocco for his beneficial feedback and instructions throughout these past months. I am also thankful for my parents and other family members for believing in me and giving me the motivation to be consistent during this process. Finally, I would like to thank fellow hard-working students at the Erasmus University of Rotterdam for keeping me inspired and less distracted.

Keywords*:* M&A, acquiring firms, financial performance, ESG score, Sustainability, United States

[1] Throughout this thesis, the terms "sustainability performance" and "ESG performance" are used interchangeably.

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1. Introduction

The globally fast-changing market has made it increasingly harder for firms to keep up with the change of customer preferences, modern technologies, innovations, and new entrants within industries (Sun, 2022). These adjustments have forced companies to embrace different restructuring activities to reduce financial distress, uncertainty and enhance the success of their business. For instance, an example of such a corporate restructuring is mergers and acquisitions (M&As), which refers to an agreement between two firms or more combining into a single organization to attain specific strategic objectives (CFI Team, 2023a). Moreover, M&As are considered a popular inorganic growth method among firms who want to achieve a competitive advantage over their competitors as they are meant to increase market share, synergies, and boost efficiency via economies of scale/economies of scope (Kumar & Bansal, 2008).

Since 2010, over 500.000 M&A deals have been globally completed, where a peak in 2021 was reached with a value of approximately 5.9 trillion U.S. dollars. During this year, the United States accounted for more than 50% of the global M&A deal value (Statista Reseach Departmant, 2022). This country is considered the most attractive market for M&A; however, it was not until the late 1890s (first merger wave) that M&A activity became progressively desired as six prevalent merger waves can be distinguished.

Zooming in on the United States, more than 300.000 M&A deals have been completed since 1985 in which a new record was broken in 2017 regarding the number of deals in one year (15.100 completed deals)[2].

Despite the growing popularity of M&A transactions, these strategies are not always known to be successful and obtain their expected synergies as there has been little evidence that these transactions benefit the shareholder value of the acquiring firm (Campa & Hernando, 2004). According to many studies, around 70-90% of M&A transactions fail mainly due to integration problems, deficient communication, and unreasonable expectations (Boynton, 2019; Garisson, 2019). In 2001, AOL acquired Time Warner in a merge that costed around 160 billion dollars, however a year later this transaction resulted in the biggest annual loss of 99 billion dollar (Patel, 2021).

[2] https://imaa-institute.org/mergers-and-acquisitions-statistics/united-states-ma-statistics/

To this day, this merger has been classified as the biggest M&A failure in history. However, it did not end in this catastrophe as many failures of M&A deals followed.

The inquiry into whether M&A enhances a firm's financial performance has been investigated empirically for years, however leading to contrary results. For instance, Inoti, Onyuma, and Muiru (2014) found that acquisitions do not seem to change the financial performance of the acquiring firms in Kenya, measured using various profitability and asset utilization measures. On the contrary, Mantravadi and Reddy (2008) made clear that mergers in general appear to negatively impact the performance of acquiring companies in India as the Gross profit margin and Return on Capital Employed showed significant declines. In addition, related results were found as Akben-Selcuk and Altiok-Yilmaz (2011) made clear that the period after acquiring resulted in significantly lower Return on Assets (ROA) and Return on Equity (ROE) compared to the pre-acquisition period for acquiring firms in Turkey. Nonetheless, firms in the Banking and Finance industry seem to benefit from these transactions as mergers lead to improved cost efficiencies and profitability margins. This positive impact on a firm's financial performance is harmonious with the study conducted by Healy, Palepu, and Ruback (1992). They examined the post-acquisition cash-flow performance of the 50 largest mergers in the United States and found that merged companies have significantly improved in terms of asset productivity relative to their corresponding industries.

In more recent years, ESG (Environmental, Social and Governance) applications have been a more discussed topic due to the growing regulatory pressures and increased awareness of sustainability issues (Matten & Moon, 2008). Companies committed to M&A transactions have been intrigued by their ESG performance as more firms have been incorporating ESG issues into their investment examinations and corporate decision making (Gillan, Koch, & Starks, 2021). Oddly enough there is limited research literature surrounding the impact of M&A transactions on a firm's ESG performance. Barros, Matos, Sarmento, and Vieira (2022) revealed that mergers and acquisitions tend to increase the ESG performance of firms one year after the M&A event in a sample that covers 41 countries by using ESG combined score, and their three individual pillar scores (environmental, social and governance score) as sustainability performance proxies.

Overall, the literature on the firm's performance after M&A deals has been researched in different industries and countries. However, the existing literature is mostly short-term and financial performance focused, which leaves room to fill the gap on the long-term firm performance by also incorporating non-financial performance measures (ESG score and three individual pillar score).

Considering that the United States is classified as the largest acquiring nation globally regarding the number of deals and its frequent M&A activity[3], it is of immense importance to investigate the impact of M&A deals on the long-term financial and sustainability performance of acquiring firms in the United States to fill the gap in the existing literature. Therefore, this paper examines the subsequent research question:

"What are the long-term impacts of mergers and acquisitions completed in 2017 on the financial performance and sustainability performance of listed acquiring companies in the United States?"

To help answer the research question, the following sub-questions are composed:

- What is a potential driver for change in the long-term financial performance during the post-M&A period?
- Do different industry divisions change the impact of M&A on financial performance?
- To what degree is there a theoretical and economical association between financial performance/sustainability performance and the presence of M&A deals?

This paper attempted to study the impact of M&A deals, taken place in 2017, on the financial performance and sustainability performance of listed acquiring firms in the United States, where information on these deals and ESG data are retrieved from the Refinitiv Eikon database. For this research, fixed effect panel regressions are conducted with the inclusion of multiple control variables to analyze this impact to help answer the research question.

[3] https://www.statista.com/statistics/961276/leading-acquirer-countries-worldwide-for-mergers-and-acquisitions/

The findings show that the firm's profitability position and liquidity position have diminished for the post-M&A period (2017-2022), while the leverage position has increased. Meaning that M&A deals have a negative impact on the financial performance of acquiring firms in the United States, but at the same time increased Earnings per Share benefiting the shareholders. This impact on the financial performance did not seem to vary depending on whether the M&A deal was cross-border or domestic. In addition, this study shows that the M&A impact on the acquiring firm's financial performance experience industry heterogeneity since the financial performance significantly differs across the 9 industry divisions.

Moreover, M&A deals are positively related with the ESG performance of acquiring firms in the United States as the combined ESG score and individual pillar scores increased after these deals, however this positive impact weakens as the size of the firms increases.

This research paper will contribute to the existing M&A literature in various aspects.

Although preliminary studies have investigated the impact of M&A on firm performance, the focus mostly was on the comparison of post-merger performance with pre-merger performance using the paired t-test approach (Harvey, 2015; Inoti et al., 2014; Mantravedi & Reddy, 2008), which eliminates the use of control variables to consider other factors that could contribute to the change in financial performance. This is the first paper that uses panel regressions with multiple control variables, where the financial performance is measured using six accounting-based indicators to enhance the validity of our results. Furthermore, no earlier study has used listed acquiring companies in the United States to analyze the long-term financial performance after M&A transactions and investigated whether this impact deviates for different industry divisions, as an extant study solely focused on a sample of the 50 largest acquisitions in the United States, and therefore excluded smaller M&A events. Lastly, this is the first study to explore the relationship between M&A operations and the acquiring firm's ESG performance laying the focus in the United States, as a precedent study used a sample of 41 countries (Barros et al., 2022).

The aim of this study is to provide investors and stakeholders with a better comprehension on potential rewards and risks that can come from mergers and acquisitions, while also helping firms make improved choices about whether to follow the M&A route. Furthermore, regulators

and policymakers can also benefit from this paper as the investigated impact of M&A on the financial and sustainability performance could enhance the decisions regarding economic strategies to reduce the potential negative effects of M&A on the wider economy.

The remainder of this paper is divided as follows. Section 2 outlines the theoretical analysis and presents the hypothesis that guides our research. Consequently, Section 3 gives a detailed description of the data used and methodology to examine the relation between M&As and firm performance. In Section 4 and Section 5, panel regressions are conducted to present and discuss the main results, as well as robustness tests to support the findings of this research. Lastly, Sections 6 contains the conclusions followed by the limitations of this study.

2. Review of Literature and Hypotheses

Corporate restructuring strategies in the United States has increased its popularity since the 1890s due to the enhanced pressure on firms to remain their competitive positions in a rapidly developing global economy and the risks of regulatory changes (Shin, 2017). The action of restructuring is important to improve the firm's performance and settle any financial setbacks, where mergers and acquisitions are classified as the most generic form of corporate restructuring (Polymeridou, 2019). Firms merge with or acquire other firms for multiple reasons: combining businesses is expected to create synergy, increase market share, and grants the acquiring company to defeat future competitors (Palmer, 2022). This section will report the results that several studies found on the impact of M&As on the financial performance (in different industry divisions), and sustainability performance of acquiring companies.

2.1. M&A deals and performance of the acquiring firm

The literature on M&A, especially about the pre-and post M&A performance, has been a popular topic subjected by multiple research studies. According to Cording, Christmann, and Weigelt (2010), 92% of the research studies use one of the three main methods to measure performance, namely the accounting-based approach, stock-market based approach and announcement-effect event study approach. In a sample of 400 companies with the biggest M&A deals, CEOs (Chief Executive Officers) were asked which approach is best suited to investigate post-merger performance. Most surveyed CEOs indicated that accounting-based performance measures are better indicators compared to measures based on the market (Kukalis, 2007).

The relation between M&A deals and the financial performance of the acquiring companies has been studied where variations in countries, study period and settings are seen. Although M&A pursues to be a favorable inorganic growth strategy for firms, its impact on a firm's performance till this day leads to contradicting results coming from many studies. As some studies showed that M&A transactions do not create value for acquiring companies and worsens the shareholder's gains (Akben-Selcuk & Altiok-Yilmaz, 2011; Inoti, Onyuma & Muiru, 2014; Kumar, 2009). For instance, Kumar (2009) investigated the impact of merger deals on the performance

of Indian acquiring firms for the period 1992-2002. On average, no significant enhancement in profitability and asset productivity was found for the three years after a merger. Thus, in this case mergers do not seem to enhance the acquirer's financial performance, which is harmonious with the findings of Inoti et al. (2014) as no significant difference between the profitability of acquiring firms before and after the acquisitions was observed. Moreover, Andre, Kooli, and L'her (2004) investigated the long-run performance of 267 Canadian M&A firms between 1980-2000, insinuating that acquiring firms significantly underperform the three years after an acquisition. This result is consistent with the study by Pazarskis, Vogiatzogloy, Christodoulou and Drogalas (2006) as they revealed that the firm performance of Greek firms significantly decreased after M&A deals, measured using various financial ratios.

However, contradicting results were reported by other studies as they showed that the shareholder value and financial performance of acquiring firms seems to increase following M&As as both the dividend per share and earnings per share increases (Harvey, 2015; Healy, Palepu, & Ruback, 1992; Magenheina & Mueller, 1988). For instance, Healy et al. (1992) investigated the post-M&A cash flow performance of the 50 largest mergers for the period 1979-1984. Their results indicate that merged companies appear to have enhanced asset productivity leading to increased operating cash yields with this impact being significantly stronger for companies with exceptionally overlapping corporations. Equivalent results are found by Rahman and Limmack (2004) who focused their research on Malaysian acquiring firms and reported enhancements in the long-term cash flow performance and shareholder value as both the return on sales and asset turnover incremented after acquiring. Furthermore, Kumar and Bansal (2008) show that mergers and acquisitions created synergy as significant improvements in the long-run financial performance (3 years after deals) for the acquiring firms was reported laying focus on M&A transactions in India. Looking into a longer post-M&A period, Aggarwal, and Garg (2022) found that mergers still have a significant positive impact on the profitability and liquidity of acquiring companies in the five years after a merger, thus showing significant correlation between M&A transactions and long-run financial performance.

It seems from the existing literature that the impact of M&As on the financial performance has been conducted taking various aspects into account, however this is the first study that uses

acquiring companies in the United States to examine the long-run financial performance before and after M&A deals, using six accounting-based measures. Based on this gap, the first hypothesis is introduced:

> *H1: M&A deals have a positive impact on the long-run financial performance of acquiring companies in the United States, Ceteris paribus.*

2.2. Do cross-border M&As perform better compared to domestic M&As?

The impact of cross-border M&As on the long-run financial performance of acquiring firms depends on numerous factors, such as the regulatory, legal, and cultural environment. Perhaps, acquiring firms can benefit from cross-border M&As as it could open a world to new customers and technologies, which could lead to economies of scope and enhance their competitive position in the market. According to Boateng, Qian and Tianle (2008) the participation in cross-border M&As are chiefly encouraged by the increasing market share to empower the entrance into new markets and the access to progressive technologies. Furthermore, studies revealed that Chinese and Indian firms, who partook in cross-border M&As generated value and created notable shareholder wealth (Nicholson & Salaber, 2013). In addition, the sales, investments, and productivity of the acquiring firms, specifically in France, and the U.K. are amplified after partaking in cross-border M&A transactions (Stiebale & Trax, 2011).

On the contrary, these cross-border mergers and acquisitions can come with their issues and risks, as the integration of the target firm's culture and functioning with the acquiring firm can come with legal challenges and strenuous tax laws (Naunton, 2022).

Generally, the impact of cross-border M&As tends to lead to mixed results, with some studies revealing that these deal types lead to enhanced financial performance and others reporting no significant impact. For instance, Singla, Saini, and Sharma (2012) investigated the cross-border M&A impact of 15 acquiring firms in India. They reported that the financial performance of these firms did not significantly change in the post-merger period relative to the pre-merger period. Whereas the study conducted by Liu, Li, Yang and Li (2021) who examined 86 Chinese cross-border M&As between 2007-2012, reported that the domestic M&As performed significantly better than the cross-border M&As.

Specifically, it was revealed that cross-border acquisitions lead to a significant decrease of the acquiring company's market value over the five years post-M&A (Gugler et al., 2003). Moreover, the abnormal returns and coefficients for cross-border M&As are negative for the 3 years after the M&A event, meaning that cross-border mergers and acquisitions perform worse compared to domestic M&As (Andre et al., 2004). Focusing on acquiring firms in the United States, Moeller and Schlingemann (2004) reported that the firms partaking in cross-border M&A deals experience lower operating and stock performance relative to domestic deals.

Based on these studies that conducted research on the impact of cross-border M&As on the financial performance in different countries, this present study will investigate this effect for acquiring firms in the United States. Therefore, the second hypothesis is presented:

> *H2: Cross-border M&As will lead to a weaker positive impact on the long-run financial performance of the acquiring firms relative to domestic M&As, Ceteris paribus.*

2.3. M&A impact in different industry divisions

The impact of M&As on financial performance is expected to have industry heterogeneity as different industries vary based on market structures, level of consolidation and the regulatory nature of the industry. Several industries, such as the healthcare industry, have high Return on Equity since they require relatively less assets (Sarath, 2022). These differences in characteristics can be shown when examining the impact of M&A on the financial performance of different industry types (Kumar & Bansal, 2009). Although some industries experience gains from M&A transactions, others can experience negative effects. For instance, Mantravadi and Reddy (2008) used a sample of 118 M&A deals between 1991-2003 in India and confirm that a variation of industry types does lead to deviations in the post-merger performance of acquiring companies. Specifically, the companies in the banking and finance sector were positively impacted, in terms of profitability, after the merger. In addition, service companies outperformed manufacturing firms in terms of accounting-based performance measures (Aggarwal & Garg, 2019).

Whereas the pharmaceutical, textile, chemicals and Agri-products sectors were negatively impacted, in terms of profitability and Returns on Investments (ROI). A potential explanation for this negative impact can be that companies within these sectors face high debt levels,

integration hurdles and regulatory issues, which makes it harder to make returns on their investments.

Based on these findings, this present study will investigate whether the type of industry division, classified using Standard Industrial Classification (SIC) codes, will lead to a differential impact on the financial performance after mergers and acquisitions. For this reason, the third hypothesis is introduced:

> *H3: The impact of M&A deals on the financial performance of acquiring companies varies across different industry divisions.*

2.4. ESG performance after M&A deals

In more recent years, many firms have been embodying sustainability into their corporate decision-making processes due to the pressure from investors, consumers and recognizing the significance of sustainability issues in the long-term success of companies. These firm types have been getting growing attention from investors as some of the biggest institutional investors incorporate sustainability into their investment decisions (Khan, Serafeim & Yoon, 2016). In the case of mergers and acquisitions, ESG scores (measure of Corporate Social Responsibility behavior) have developed into a crucial factor, as both the firms partaking in these deals now take more interest in their ESG performance and how investors view their sustainability operations. According to Henisz, Koller and Nuttall (2019), companies that take notice of ESG factors tend to be less susceptible to legal and operational risk, accompanied by significantly reduced firm expenses. Moreover, taking interest in these ESG concerns is correlated with an increase in equity returns, less loan and a significant increase in credit ratings.

Despite the popularity of integrating sustainability, the literature analyzing the impact of M&A transactions on a company's ESG performance has been scarce (Gillan, Koch & Starks, 2021) and even more limited on specifically the M&A impact on the acquirers ESG performance (Barros et al., 2022; Tampakoudis & Anagnostopoulou, 2020). Using a sample of 100 European M&A deals between 2003-2017, Tampakoudis and Anagnostopoulou (2020) revealed that firms that acquire target firms with a higher ESG score will have higher post-merger ESG scores consequently leading to a higher market value for the acquirer. In addition, M&A transactions

have a positive impact on the ESG performance in the year following the deal event, meaning that sustainability challenges become more relevant throughout the M&A process (Barros et al., 2022). This finding is consistent with the results obtained by Caiazza, Galloppo, and Paimanova (2021), who report that after finalizing M&A transactions, the ESG score is improving for the firms involved in the deal. This present study will investigate this relationship between M&A deals and ESG performance of acquiring firms in the United States, as it could help to evaluate the potential benefit of M&As and help companies in the future that want to partake in these deals. Based on this, the fourth hypothesis is presented:

> *H4a: M&A deals have a positive impact on the ESG performance of the acquiring firms in the United States, Ceteris paribus.*

However, this expected positive M&A impact on the ESG performance of acquiring firms could potentially differ in terms of the size of a company. For instance, small acquiring firms tend to be beneficial for shareholders, however these companies make small acquisitions with lower dollar profit. Whereas larger firms take part in large acquisitions that tend to result in larger losses. Smaller acquiring firms reveal significantly higher synergy gains in comparison to large acquiring firms and the same hold for the announcement returns as they are reported to be approximately 2% higher for small acquiring firms (Moeller, Schlingemann & Stulz, 2004). In addition, the study by Arvanitis and Stucki (2015) examines the impact of M&As on the post-merger performance of small and medium-sized companies (SMEs). They revealed that SMEs were significantly positively impacted during the post-M&A period as three performance indicators increased. Possible reasons that small acquiring firms are better than large acquirers in terms of performance, could be due to economies of scale that small firms enjoy and the higher free cash flows of large firms leading the management to make substandard M&A decisions instead of increasing the shareholder's compensation (Byun & Ahn, 2007).
As the above studies show, the size effect on the impact of mergers and acquisitions on the financial performance has been investigated, however whether the size of a firm leads to a differing M&A impact on the ESG performance of acquiring firms has not been studied yet. Therefore, the following hypothesis is presented:

H4b: A larger firm (size) will lead to a weaker positive M&A impact on the ESG performance of the acquiring firms in the United States, Ceteris paribus.

3. Data and Methodology

3.1. Research Objectives

Considering the limited literature on the impact of mergers and acquisitions in the United States, this present study attempted to investigate the impact of M&As on the long-run financial performance of acquiring firms, which describes the first hypothesis. To test the second hypothesis, the focus was on whether cross-border M&As relative to domestic M&As significantly impacted the firm's financial performance following the deal event. This paper has also aimed to examine and analyze if there are significant deviations regarding the financial performance of different Industry divisions in the United States. Lastly, the impact of M&A deals on the ESG performance of acquiring firms in the United States and whether this impact differs for larger firms was analyzed to test the fourth hypothesis.

3.2. Sample and Data

The hypothesis H1-H3 are tested using a sample of 311 M&A transactions in the United States that took place in 2017 covering 9 Industry divisions: Agriculture (0.32%), Construction (2.57%), Manufacturing (51.77%), Mining (2.57%), Public Administration (0.32%), Retail Trade (5.14%), Services (23.79%), Transportation (9.00%) and Wholesale Trade (4.50%). This present study solely focused on the acquiring companies in the United States, thus the target firms are from a wider range of countries such as Austria and Canada. Moreover, M&A data for 2017 are retrieved from the Refinitiv Eikon database, considering the following criteria:

- Only completed M&A deals
- Both cross-border and domestic M&As
- Acquiring firms are situated in the United States.
- The tickers of the acquiring firms are available.
- The acquiring firms should be listed.
- Firms in the finance industry are excluded[4].

[4] According to Foerster and Sapp (2005), financial firms report much higher leverage levels and responsiveness to financial threats compared to other industries, which could lead to biased results.

This study retrieved financial data from Wharton Research Data Services (WRDS). As this paper aims to compare the financial performance of acquiring firms in the United States before and after M&A deals, the Compustat North America database[5] is used as it provides financial data for North American and Canadian publicly traded companies. Fundamental information and accounting data, such as the total assets and total liabilities, were downloaded for the period 2015-2022 using the sample obtained from Refinitiv Eikon. Moreover, identifying information, such as the ticker symbols, fiscal years and SIC codes, were retrieved from the same database to connect the financial information to these identifiers. In addition, the ESG combined score and its individual pillar scores for all the acquiring companies were conducted manually by searching each available acquiring firm within the Refinitiv Eikon universe, which are used to measure a firm's performance in the field of environmental, social and governance actions.
Furthermore, the two years before 2017 are identified as a pre-M&A period (2015-2016), 2017 is considered a M&A transaction year (event year) and the 5 years after as a post-M&A period (2017-2022) to compare the financial and sustainability performance pre-and post-M&A deals for each acquiring firm. However, the firms that did not have financial data available for the consecutive eight years within our study period were excluded from the sample, leaving a sample size of 311 listed acquiring firms that went into M&A in 2017 with available financial data for the period 2015-2022. In addition, as the ESG data had to be conducted manually this study only focused on a part of the sample size and of this subsample not all firms had available ESG data that fits within this study's period, leaving a sample size of 134 acquiring firms with available ESG information. The sample period is chosen to focus on more recent M&A transactions and to have adequate data to display long-term post-M&A performance.

3.3. Variables

Financial data of the acquiring firms were retrieved for eight years: 2 years before the M&A, the M&A year, and 5 years after the event. After viewing the histograms of the variables, outliers were visible for five variables, namely NPM (net profit margin), ROCE (Return on Capital

[5] https://wrds-www.wharton.upenn.edu/pages/get-data/compustat-capital-iq-standard-poors/compustat/north-america-daily/

employed), Current Ratio (CR), Debt-to-Equity ratio (DE) and EPS (Earnings per share). To minimize the impact of these outliers, the top 1% and bottom 1% of these variables were winsorized (See Appendix A).

Dependent variables - The financial performance, which is the dependent variable, is measured using four parameters to analyze the overall financial state of acquiring firms that close on M&A deals. Accounting-based performance measures are calculated using the retrieved financial data, as these measures seem to be better indicators compared to measures based on the market (Kukalis, 2007). Therefore, this study's four parameters and their variables are:

1. Profitability position: Net Profit Margin (NPM), Return on Capital Employed (ROCE) and Return on Assets (ROA)
2. Liquidity position: Current Ratio (CR)
3. Solvency position: Debt-to-Equity Ratio (DE)
4. Investment return: Earnings per Share (EPS)

Mergers and acquisitions increase the market share leading to economies of scale, which is said to be a feasible way to increase profitability (Simons & Bruch, 2018). However, if the profitability of the firm is not enhanced after the M&A deal, the transaction cannot be classified as successful. For this reason, it is important to investigate whether the profitability position of the acquiring firm improves after mergers and acquisitions. According to Aggarwal and Garg (2022), M&A changes the working capital structure which consequently impacts the liquidity position of the acquiring firm. In addition, liquidity ratios are a measure to analyze a firm's long-term financial strength, which is the reason this study also examines the liquidity position, namely the Current Ratio, to look at the firm's ability to pay its short-term bills (Johnson, 2001). If the M&A transactions are followed through successfully, then the liquidity ratio is assumed to increase. Furthermore, the Debt-to-Equity ratio is used to examine the firm's financial leverage to inform how much debt a firm has relative to its assets. Because of M&A deals, the solvency positions are expected to change significantly. An increasing ratio illustrates a riskier financial position, whereas a lower ratio means a more secure financial position. The last financial performance indicator, EPS, measures investment returns. An increase in the Earnings per Share insinuates that the shareholder benefited in terms of improved share earnings (Harvey, 2015).

On the other hand, the sustainability performance is measured using four indicators with a score ranging from 0-100 for each acquiring firm, namely the ESG combined score, environmental score, social score, and governance score, with a higher score indicating better ESG performance. The ESG combined score covers the ESG score with ESG controversies to provide a full assessment of a firm's impact regarding sustainability. In the existing literature, a growing interest in using ESG scores as a performance proxy can be noticed. For instance, Barros et al. (2022) used four different ESG measures to evaluate the effect of M&A transactions on the acquiring firm's ESG performance. These numerical scores are used to accredit the commitment of a company or organization regarding environmental, social and governance issues.

Independent variable - This present study is interested in examining how an acquiring firm's financial performance and ESG performance changes after engaging in M&A deals. To do this, a dummy variable called "M&A" is created, which takes a value of 1 for the period from 2017-2022 and 0 for the period before the deal event. Yadong, Lee, Kee, and Quah (2019) also used a dummy variable to distinguish the periods before and after the M&A deal for comparing reasons. A positive coefficient would indicate that M&As have a positive impact on the company's performance. In simpler terms, the study aims to determine if M&A deals have a positive or negative impact on an acquiring company's financial performance and ESG performance using numerous performance proxies.

Control variables – To curb the influence of extraneous variables and improve the accuracy of this study's results, various control variables will be implemented that are correlated with the dependent variables.

For the regression with the financial performance as the dependent variable, the firm's size (SIZE), exclusive assets (EA), solvency (SOL) and cash holdings (CASH) are incorporated as control variables. The control variables are retrieved from the studies by Zhang, Wang, Li, and Chen (2018) and Yadong et al. (2019). Zhang et al. (2018) revealed that the firm size had a positive impact on the financial performance proxies, insinuating that these companies enjoy economies of scale. Furthermore, a positive relation between M&A deals and the exclusiveness of assets is found (Cording et al., 2002), which explains why this study used "EA" as a control variable. In addition, the ratio of cash to total assets (CASH) was found to have a positive significant impact

on the performance, indicating that a higher cash ratio is expected to lead to a better firm performance.

For the regression with the sustainability performance proxies as the dependent variables, the firm's size (SIZE), leverage (DE), Return on Assets (ROA), Current Ratio (CR) and Tangibility (TANG) are incorporated into the regression model as control variables. Following behind the literature of Barros et al. (2022), larger companies are anticipated to show a higher ESG score, leverage is probable to be lower in firms with higher corporate governance and cash holdings are a measure for agency costs. Therefore, these four control variables are included to isolate the potential impact of external variables that may have distorted the relationship between the dependent variable and independent variable.

Additionally, to control unrevealed time variation, time-fixed effects are included in all regression models with yearly dummies. In addition, the number of M&A deals in 2017 for each firm is included as a control variable in all regression models, namely "M&A activity", as the acquiring firms partaking in multiple deals can have a differing impact on the firm performance compared to firms that engage in one deal. Moreover, the mentioned variables implemented in the regression models and their definitions are displayed in Table 3.1.

Table 3.1. Definitions of all the variables

VARIABLES	DEFINITIONS
NPM[6]	Net Profit Margin is retrieved from Compustat North America
ROCE	Return on Capital Employed is retrieved from Compustat North America
ROA	Return on Assets are retrieved from Compustat North America
CR	The Current Ratio is measured by the current assets/current liabilities
DE	The Debt-to-Equity ratio is calculated using total debt/(assets-liabilities)
EPS	Earnings per Share is retrieved from Compustat North America
ESG	Combined ESG score with a range from 0-100
ENVIRONMENTAL	Environmental score with a range from 0-100
SOCIAL	Social score with a range from 0-100
GOVERNANCE	Governance score with a range from 0-100
M&A	Dummy variable equals 1 in the deal year and the years after, zero otherwise
CROSS-BORD	Dummy variable equals 1 if the M&A deal is cross border, zero otherwise
SIZE	The size of a firm is the natural logarithm of total assets
CASH	The cash holding is measured by cash/total assets
EA	Exclusive assets are measured by intangible assets/total assets
SOL	Solvency is calculated as the ratio of total liabilities to total assets
TANG	The tangibility is measured as the ratio of Property, Plant and Equipment/total assets
M&A ACTIVITY	The number of M&A deals per firm in 2017, the activity is 0 for the other years

Note. This table gives the definitions and measurements of all the variables used within this study's regression models.

3.4. Analysis Methods

The first hypothesis was tested by conducting panel regressions, where the acquiring firm's financial performance was compared during the period 2015-2016 to the period in 2017-2022, which designates the date before the M&A deal year and the time during/after the M&A deal.

[6] "NPM", "ROCE" and "ROA" (dependent variables) were retrieved from the WRDS universe as monthly data and were converted into yearly values with the use of a PivotTable in the Excel format.

To better understand the relation between the impact of cross-border M&A deals and the financial performance, an interaction term was added for the second hypothesis.
To analyze the third hypothesis, the research sample was divided by their industry division, to examine the impact of M&A deals across different industry divisions by using the first regression model.
The fourth hypothesis was tested by comparing the sustainability performance of the acquiring firm during the period 2015-2016 to the period in 2017-2022 using a fixed-effect panel regression. Additionally, to test whether this impact differs for larger firms, an interaction term between the M&A dummy and SIZE variable was included. The lapse of time of ESG data for the acquiring firms varies, for instance one firm has data available for the period 2015-2022 and another firm only has data for the period 2016-2020, indicating that the panel data gathered is considered unbalanced.
For each of the four models, the fixed effect panel regression will be conducted since the null hypothesis of random effects being the preferred model was rejected after performing the Hausman Test. This defines that the fixed-effect method was credible as it uses panel data to control for variables that vary across firms while being constant over time. Therefore, this present study will also include yearly dummies to control variables that change over time but are constant across firms. Furthermore, all the preliminary examinations and regressions will be tested using the Statistical Software for data science, namely Stata.

The first regression model[7] will be conducted to test the impact of M&A deals on the financial performance of acquiring firms in the United States and whether this impact deviates across different industry divisions. For the first hypothesis and second hypothesis to be examined, the first regression model will be run six times as this study has six financial performance indicators:

$$FP_{it} = \beta_0 + \beta_1 M\&A_t + \beta_2 SIZE_{it} + \beta_3 CASH_{it} + \beta_4 EA_{it} + \beta_5 SOL_{it} + \beta_6 M\&Aactivity_{it} + \beta_7 YEARLY_{it} + \varepsilon_{it} \quad \textbf{(1)}$$

[7] The "i" in the regression models represents company variation and the "t" represents time variation.

To test whether the M&A impact on the financial performance varies depending on whether the deal is cross-border or not, an interaction term was included, leading to the second regression model:

$$FP_{it} = \beta_0 + \beta_1 M\&A_t + \beta_2 CROSS - BORD_{it} * M\&A_{it} + \beta_3 CROSS - BORD_{it} + \beta_4 SIZE_{it} + \beta_5 CASH_{it} + \beta_6 EA_{it} + \beta_7 SOL_{it} + \beta_8 M\&Aactivity_{it} + \beta_9 YEARLY_{it} + \varepsilon_{it} \quad \textbf{(2)}$$

The following regression models are adopted to test the impact of M&A transactions on the ESG performance of acquiring firms, using four measures, in the United States and whether this impact differs for larger acquiring firms:

$$ESG_{it} = \beta_0 + \beta_1 M\&A_t + \beta_2 SIZE_{it} + \beta_3 DE_{it} + \beta_4 ROA_{it} + \beta_5 CR_{it} + \beta_6 TANG_{it} + \beta_7 M\&Aactivity_{it} + \beta_8 YEARLY_{it} + \varepsilon_{it} \quad \textbf{(3)}$$

$$ESG_{it} = \beta_0 + \beta_1 M\&A_t + \beta_2 SIZE_{it} * M\&A_t + \beta_3 SIZE_{it} + \beta_4 DE_{it} + \beta_5 ROA_{it} + \beta_6 CR_{it} + \beta_7 TANG_{it} + \beta_8 M\&Aactivity_{it} + \beta_9 YEARLY_{it} + \varepsilon_{it} \quad \textbf{(4)}$$

Various data checks are conducted before running these regressions. For instance, pairwise correlation analysis is conducted to detect potential (multi)collinearity, panel unit root tests and modified Wald were conducted to disclose potential stationarity and groupwise heteroskedasticity (See Appendix B).

4 Results

This section reports the empirical findings and attempts to link the results to the existing research literature. First, the preliminary analysis, such as the descriptive statistics, will be examined followed by answering the hypotheses introduced in Section 2. Furthermore, the research question will be answered by conducting panel regressions and a sub-sample analysis.

4.1. Descriptive Statistics

The descriptive statistics of all the used variables needed to test hypothesis H1-H3 are disclosed in Table 4.1, where the variables are based on the financial data for the period 2015-2022. As is shown the number of firm-year observations is 2488, which equals 311 acquiring firms each with available data for eight years.

The means of the Net Profit Margin (NPM), Return on Capital Employed (ROCE) and Return on Assets (ROA) are 0.036, 0.12 and 0.118, designating that these three financial performance indicators are on the edge of becoming more profitable. According to the CFI Team (2023b), an average Net Profit Margin is approximately 10% and a margin of 5% is considered low, thus the NPM of 3.6% can be classified as a financial performance below average. Furthermore, the average ROCE of 12.0% indicates that for every dollar invested in capital, the firm produces 12 cents of operating income. In general, a firm is considered in a good financial state if the ROCE is at least 20%, meaning that the ROCE of 12.0% within this study's sample is relatively low (Hayes, 2022). In addition, the average ROA of 11.8% is considered as an above average financial performance, which means that the firms are generating efficient profits (Birken & Curry, 2021). When looking at the liquidity position, an average Current Ratio (CR) of 2.202 is observed insinuating that the firms have $2.202 of current assets for every $1 of current liabilities. In this case, this ratio designates sufficient liquidity to pay its debts and liabilities (Fernando, 2023). Looking into the leverage position, an average Debt-to-Equity ratio of 0.353 is reported, indicating that of every dollar of equity invested in the firm, about 35.3 cents, is financed through debt. This ratio is considered good from a risk outlook (Ross, 2022). Moreover, an average of 18.1% of this study's M&A deals are classified as cross-border. The average firm size is 8.131 with a minimum value of 2.228 and maximum value of 13.22, which indicates the

difference in the size of listed acquiring firms in the United States. Lastly, the average total liabilities/total assets ratio (SOL) is 56.9% meaning that the firms on average have more assets than liabilities. Generally, investors are interested in companies with a ratio between 0.3-0.6 (Hayes, 2023).

Table 4.1. Descriptive Statistics of all the variables used for hypothesis H1-H3

Variable	Obs	Mean	Std. Dev.	Min	Max
NPM	2488	.036	.228	-1.529	.367
ROCE	2488	.12	.148	-.537	.574
ROA	2488	.118	.111	-.786	.814
CR	2488	2.202	1.698	0	10.094
DE	2488	.353	.239	0	1.16
EPS	2488	3.055	4.914	-7.79	28.79
M&A	2488	.75	.433	0	1
CROSS-BORD	2488	.181	.385	0	1
SIZE	2488	8.131	1.877	2.228	13.221
CASH	2488	.105	.112	0	.915
EA	2488	.324	.218	0	.935
SOL	2488	.569	.225	0	1.811
M&A activity	2488	.273	.922	0	11

Note. This table describes the number of observations, mean, standard deviation, minimum and maximum values of the six different dependent variables (NPM, ROCE, ROA, CR, DE, and EPS), independent variable (M&A) and control variables used in the regression models for the period 2015-2022.

On the other hand, Table 4.2 reports the descriptive statistics of all the variables used to test the fourth hypothesis, which will be tested using the third and fourth regression model (See Section 3.4). As is shown, the number of firm-year observations is 956, which equals 134 acquiring firms.

The average ESG combined score of the acquiring firms is 47.91 with a minimum value of 1.3 and a maximum value of 90.88, which mirrors the difference in these scores across firms. Furthermore, the environmental score has a relatively lower mean, whereas the average social score and governance score are relatively higher compared to the combined ESG score. According to Krychiw (2023) ESG scores lower than 50 are considered below par, these relatively low scores indicate that employees are not treated well, and the firms are not following the best actions regarding sustainability issues. Moreover, the average firm size is 8.618 with a minimum value of 4.901 and maximum value of 12.95, meaning that the size across acquiring firms shows a significant difference. In addition, the maximum number of M&A deals that

acquiring firms engaged in equals 9. Lastly, the average Debt-to-Equity ratio of 0.361 means that the total debt of acquiring firms is 36.1% of total equity, thus the firms have more assets in comparison to debt. In general, a ratio below 1 (<100%) is considered relatively secure, however whether the ratio is "good" or "bad" is highly dependent on the kind of business and industry (Hayes, 2023).

Table 4.2. Descriptive Statistics of all the variables used for hypothesis H4a and H4b

Variable	Obs	Mean	Std. Dev.	Min	Max
ESG	956	47.908	18.525	1.3	90.88
Environmental	956	37.723	27.882	0	94.17
Social	956	51.249	22.277	1.72	98.94
Governance	956	57.063	20.583	2.55	96.21
M&A	956	.738	.44	0	1
SIZE	956	8.618	1.452	4.901	12.949
DE	956	.361	.225	0	1.086
ROA	956	.143	.08	-.452	.591
CR	956	2.137	1.713	0	10.094
TANG	956	.217	.202	.009	.911
M&A activity	956	.295	.942	0	9

Note. This table describes the number of observations, mean, standard deviation, minimum and maximum values of the dependent variables (ESG, Environmental, Social and Governance), independent variable (M&A) and control variables used in the third regression model for the period 2015-2022.

4.2. Two-sample t-tests

Two-sample t tests were applied to compare the mean value of all the variables for the period before and during/after M&A deals. As reported in Table 4.3, it can be verified that M&A deals have an impact on the acquiring firm's financial performance and other firm characteristics. For instance, the mean of ROCE and CR have significantly decreased in the period after M&A transactions, whereas DE increased, indicating that M&A deals have a negative impact on three of the six financial performance indicators. ROCE decreased by 0.016 and CR decreased by 0.276. The Debt-to-Equity (DE) ratio has also been impacted by M&A as the ratio has increased to 0.063, indicating that the acquiring firms are borrowing more following the M&A deals.
On the contrary, M&A deals seem to have a positive impact on EPS, as the Earnings per Share have increased with 1.191 after the M&A period compared to the period before. This positive impact insinuates that the shareholders benefit from these deals.

Nonetheless, the mean difference before and during/after M&A deals were not significant for the Net Profit Margin (NPM) and Return on Assets (ROA), therefore no further conclusions regarding the difference can be made. Overall, these results show that the listed acquiring firms in the United States are significantly impacted regarding the financial performance, firm size, solvency, and exclusive assets.

Table 4.3. Two-sample t test for hypothesis H1-H3

Variables	**Before M&A (2015-2016)**		**During/After M&A (2017-2022)**		**Mean difference**	**T-test**
	Mean	Std. Dev	Mean	Std. Dev		mean(before)-mean(during/after)
NPM	.02824	.22904	.03795	.22711	-.00971	0.3568
ROCE	.13194	.16129	.11554	.14287	.01640**	0.0165
ROA	.11979	.12461	.11674	.10626	.00305	0.5533
CR	2.4087	1.8726	2.1330	1.6311	.27564***	0.0005
DE	.30619	.24317	.36883	.23624	-.06263***	0.0000
EPS	2.1615	3.2828	3.3524	5.3157	-1.1908***	0.0000
CROSSBORD	.00000	.00000	.24116	.42790	-.24116***	0.0000
SIZE	7.8077	1.9407	8.2386	1.8436	-.43088***	0.0000
CASH	.11684	.12854	.10126	.10510	.01559***	0.0025
EA	.29806	.21975	.33260	.21702	-.03455***	0.0006
SOL	.54798	.23867	.57646	.21939	-.02848***	0.0062
M&A activity	.00000	.00000	.36334	1.0494	-.36334***	0.0000

Note. This table reports mean-comparison for the period before and during/after M&A deals regarding the first two regression models. The last column contains the p-values with an H0 being the mean difference=0. The number of firm-year observations before M&A are 622 and 1,866 observations during/after M&A deals. ***p<0.01, **p<0.05 and *p<0.10

As shown in Table 4.4, there is also evidence that M&A transactions have a positive impact on the ESG performance. The mean of the combined ESG score has significantly increased by 7.751 points during the post-M&A period and this significant increase is also visible for the three individual pillar scores (environmental, social and governance score). These findings indicate that the listed acquiring firms in the United States are positively impacted in terms of the ESG performance after M&A deals.

In addition, like the results of Table 4.3, the size of acquiring firms (0.253) and Debt-to-Equity ratio (0.050) have increased both with a significance at the 1% and 5% level after these deals.

Table 4.4. Two-sample t-test for hypothesis H4

Variables	Before M&A (2015-2016)		During/After M&A (2017-2022)		Mean difference	T-test
	Mean	Std. Dev	Mean	Std. Dev		mean(before)-mean(during/after)
ESG	42.184	19.515	49.935	17.738	-7.7509***	0.0000
Environmental	29.458	27.878	40.650	27.878	-11.192***	0.0000
Social	43.670	22.269	53.933	21.669	-10.262***	0.0000
Governance	52.555	20.794	58.660	20.284	-6.1050***	0.0001
SIZE	8.4308	1.4738	8.6837	1.4393	-.25288**	0.0179
DE	.32396	.22239	.37407	.22519	-.05011***	0.0025
ROA	.15227	.09121	.13938	.07579	.01289**	0.0290
CR	2.2448	1.7277	2.0990	1.7073	.14582	0.2476
TANG	.21059	.20228	.21957	.20154	-.00898	0.5452
M&A activity	.00000	.00000	.39943	.1.0767	-.39943	0.0000

Note. This table reports mean-comparison for the period before and during/after M&A deals regarding the third regression model. The last column contains the p-values with an H0 being the mean difference=0. The number of firm-year observations before M&A are 250 and 706 observations during/after M&A deals. ***p<0.01, **p<0.05 and *p<0.10

4.3. Main Results and Discussion

4.3.1. First Hypothesis Analysis

The impact of M&A deals on the acquiring firm's financial performance is investigated to test the first hypothesis. Fixed-effect panel regressions with six financial performance proxies (NPM, ROCE, ROA, CR, DE, and EPS) are reported in Table 4.5. The dependent variables are disclosed in Columns (1)-(6) with their five control variables. Furthermore, the variable of interest, namely the M&A dummy, allows for a comparison of the financial performance before and during/after the M&A deals.

In Column (1), the M&A dummy variable is not significant, hence there is inadequate proof for interpretations of an M&A impact on the Net Profit Margin to be made. However, this result was to be anticipated as Table 4.3 revealed that the mean difference before- and during/after M&A deals was not significant with Net Profit Margin as the financial performance proxy. A potential explanation for this insignificant finding could be that there is insufficient proof of a partial correlation between M&A and the NPM variable as it is visually displayed in the added-variable plot (See Appendix C, Figure C1). The figure presents that there is little to no relation between the M&A dummy and NPM conditional on the control variables.
In addition, in Column (3), the same insignificant M&A dummy variable is observed, indicating

there is insufficient evidence to interpret an M&A impact on the Return on Assets. This insignificant result was expected as Table 4.3 reported that the difference in mean before and during/after M&A deals with ROA as the financial performance indicator was also not significant. This finding could be explained by the limited to no correlation between this dependent variable and the independent variable, as shown in the added-variable plot (See Appendix C, Figure C2). However, this is not the first study that found no significant difference between the financial performance of acquiring firms before and after M&A deals, as Kumar (2009) and Inoti et al. (2014) established related results for acquiring firms in India and Kenya.

In Column (2), the Return on Capital Employed is significantly negatively impacted after the M&A deals, as the coefficient is -0.017. Indicating that when the M&A dummy is 1 (period during/after M&A deals), ROCE will decrease by 0.017 keeping other variables constant. An explanation for this decrease could be that the period after M&A deals was followed by a decrease in the Earnings before interest and taxes (Hayes, 2022). The pairwise correlation coefficient between ROCE and EBIT (Earnings Before Interest and Taxes) is 0.219, indicating that a decrease in EBIT leads to a decrease in ROCE. According to Kumar (2009), a reason that acquiring firms do not experience an improving financial position after M&A transactions, could be due to the unanticipated issues that causes management to lose control over its operations, which could drive down their profitability.

Additionally, Column (4) displays a significant negative M&A impact with a coefficient of -0.347. Insinuating that when the M&A dummy equals 1, the Current Ratio will decrease by 0.347. An explanation for the decreasing CR could be due to an increase in current liabilities after the M&A deals. The pairwise correlation between CR and current liabilities equals -0.185, indicating that an increase of these liabilities corresponds to a decrease in CR. The Current Ratio is calculated by current assets divided by current liabilities, so if the current liabilities increase, CR will decrease. This decline in the liquidity position during the post-M&A period, measured using CR, is consistent with the findings by Harvey (2015). The author explains that the decreasing liquidity position insinuates that the acquiring firm could go through cash flow issues and consequently finds it challenging to meet their current liabilities.

Furthermore, in Column (5) the Debt-to-Equity ratio significantly increases by 0.042 after the post-M&A period, indicating that the acquiring firms are increasing their debt usage relative to equity usage to finance their assets. An increase in the DE ratio can be interpreted as an increase in financial risk, and therefore unfavorable for the firm's financial position (Kumar & Bansal, 2008).

On the other hand, Column (6) shows that M&A deals have a significant positive impact on the Earnings per Share, as the coefficient is 2.66 with a significance at the 1% level. Meaning that when the M&A dummy variable equals 1, EPS will increase by 2.66 leaving other variables constant. This finding insinuates that M&A deals seem to have benefited the shareholders regarding share earnings, which is consistent with the results of Harvey (2015).

The findings from columns (2), (4) and (5) demonstrate that the profitability position and liquidity position have significantly declined for the post-M&A period (2017-2022), while the leverage position has increased. Meaning that M&A deals have a negative impact on the long-term financial performance of acquiring firms in the United States, which is opposed to the first hypothesis. However, the M&A transactions have positively impacted the shareholder's value, thus even though these M&A strategies do not improve the profitability and liquidity position of the acquiring firms in the United States, they produce a significant increase in the Earnings per Share (See Appendix D, Table D1).

Regarding the control variables, the SIZE coefficient is significantly positive for five out of six financial performance indicators, meaning that larger firms tend to increase the financial performance of acquiring firms in the United States. This finding supports previous literature who reported a positive relation between the size of a firm and the financial performance of Chinese firms (Yadong et al., 2019). This positive impact insinuates that these larger firms enjoy economies of scale as the production on a large scale is followed by lower costs and reduced prices, consequently leading to an improved financial position (Grzegorzek, 2021).

Regarding the CASH variable, the ratio of cash to total assets is significantly positively related to the Current Ratio (CR) and Debt-to-Equity ratio (DE). This indicates that firms with a higher cash holding can enjoy better financial performance, leaving other variables constant. Comparable results are reported by Yadong et al. (2019) who found that firms who enjoy a higher cash ratio

reach higher Return on Assets, which they used as a financial performance indicator. If a firm holds large cash amounts, it could reduce a firm's cash flow uncertainty, improve their financial resilience, and tends to get a hold on growth opportunities, which are factors that could have contributed to this positive impact (Yun, Ahmad, Jebran & Muhammad, 2021).

Table 4.5. Regression results of the M&A impact on the acquiring firm's financial performance

	NPM	**ROCE**	**ROA**	**CR**	**DE**	**EPS**
Variables	(1)	(2)	(3)	(4)	(5)	(6)
M&A	-.006 (-0.43)	-.017** (-2.09)	-.012 (-1.34)	-.347*** (-2.98)	.042*** (2.73)	2.66*** (5.87)
SIZE	.059*** (3.87)	.014** (2.12)	.029** (2.30)	.374** (2.32)	.016 (0.74)	.994** (2.11)
CASH	.165 (1.54)	.038 (1.14)	.047 (1.04)	4.99*** (7.99)	.155*** (3.11)	1.67 (1.18)
EA	.047 (0.60)	-.055** (-1.98)	.011 (0.26)	-2.57*** (-4.32)	.077 (0.96)	-1.16 (-0.76)
SOL	-.278*** (-4.37)	.018 (1.00)	-.070** (-2.39)	-2.29*** (-6.28)	1.01*** (22.16)	-7.16*** (-4.71)
MA activity	.001 (0.06)	-.002 (-0.47)	-.009 (-0.60)	.019 (1.09)	.000 (0.03)	-.060 (-0.69)
Constant	-.301** (-2.51)	.032 (0.65)	-.076 (-0.77)	.955 (0.80)	-.412*** (-2.91)	-1.29 (-0.38)
R-squared[8]	0.747	0.700	0.759	0.839	0.932	0.618
Obs.	2,488	2,488	2,488	2,488	2,488	2,488
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table displays fixed-effects panel regressions with six different financial performance indicators: NPM, ROCE, ROA, CR, DE, and EPS. The sample contains 311 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

4.3.2. Second Hypothesis Analysis

The underlying M&A impact on the financial performance of acquiring firms is tested by incorporating a "CROSSBORD" dummy as a moderating variable. The regressions were conducted in Table 4.6 with an interaction term between the M&A dummy and cross-border dummy, to investigate the potential underlying impact of this specific variable.

Like the results in Table 4.5, the profitability position (ROCE) and the liquidity position (CR) have significantly decreased for the post-M&A period, as the ROCE coefficient is -0.015 and the CR coefficient is -0.244. In addition, the Debt-to-Equity Ratio of acquiring firms has significantly

[8] The disclosed R-squared values in this table and the three tables hereafter are not retrieved from the fixed-effect panel regressions, as these within R-squared values are not correct and relatively low. To rectify these values, the "areg" command is used with a fixed effect dummy of this study's panel variable, namely Tickerid.

increased by 0.044 after the M&A deals. These findings suggest that M&A deals have a negative impact on the financial performance of acquiring firms in the United States.

The interaction coefficients between the M&A dummy and the cross-border dummy are significantly positive in Columns (2)-(4) which insinuates that the decreasing profitability position and liquidity positions after M&A deals reduces for cross-border deals relative to domestic deals. Furthermore, the interaction coefficient in Column (5) is significantly negative, insinuating that the increasing leverage position after M&A deals weakens specifically for cross-border deals relative to domestic deals. In addition, Table 4.5 revealed that the Earnings per share were positively impacted after M&A deals, this positive relation will further widen for cross-border deals relative to domestic deals as the interaction coefficient is positive. Altogether, these findings indicate that cross-border M&A deals will weaken the negative impact on the long-run financial performance of acquiring firms relative to domestic M&A delas, which is averse to Hypothesis H2 as this study expected cross-border deals to weaken the positive impact on the acquiring firm's financial performance relative to domestic M&A deals. However, these findings are consistent with extant studies who revealed that cross-border M&As seem to enhance performance and create significant shareholder value for acquiring firms (Boateng et al., 2008; Nicholson & Salaber, 2013).

Table 4.6. Regression results on the impact of cross-border M&As on the financial performance

	NPM	**ROCE**	**ROA**	**CR**	**DE**	**EPS**
Variables	(1)	(2)	(3)	(4)	(5)	(6)
M&A	-.007 (-0.05)	-.015** (-1.54)	-.011 (-1.50)	-.244** (-2.37)	.044*** (3.61)	2.45*** (5.40)
M&A*CROSSBORD	.002 (0.23)	.023*** (3.64)	.009* (1.89)	.071* (1.70)	-.065*** (-11.43)	8.02*** (33.63)
CROSSBORD	-.018 (-1.00)	-.013 (-1.36)	-.002 (-0.37)	.008 (0.09)	.070*** (8.45)	-7.63*** (-23.50)
SIZE	.065*** (4.13)	.013 (1.08)	.026*** (2.61)	.273** (2.10)	-.006 (-0.34)	.999** (2.52)
CASH	.184* (1.91)	.027 (0.47)	.045 (1.08)	5.05*** (8.63)	.181*** (4.25)	3.35 (1.64)
EA	.052 (0.73)	-.055 (-1.14)	.044 (0.83)	-2.22*** (-4.35)	.174*** (2.73)	-.721 (-0.47)
SOL	-.278*** (-4.39)	.016 (0.30)	-.062** (-2.03)	-2.34*** (-6.58)	.954*** (22.00)	-7.51*** (-4.85)
MA activity	.000 (0.05)	-.002 (-0.71)	-.009 (-0.60)	.019 (1.09)	.000 (0.03)	-.060 (-0.69)
Constant	-.341*** (-2.71)	.035 (0.40)	-.082 (-1.00)	1.34 (1.33)	-.301*** (-2.50)	-1.54 (-0.49)
R-squared	0.741	0.702	0.746	0.858	0.933	0.638
Obs.	2,488	2,488	2,488	2,488	2,488	2,488
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table displays regressions with six different financial performance indicators: NPM, ROCE, ROA, CR, DE, and EPS. The sample contains 311 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

4.3.3. Third Hypothesis Analysis

The financial performance of acquiring firms across 9 industry divisions in the United States will be compared by conducting a sub-sample analysis. Table 4.7 reports the industry division-level analysis with three financial performance indicators as the dependent variables, namely CR, DE, and EPS. Whereas Table 4.8 shows the same analysis, but now with NPM, ROCE, and ROA as performance proxies. The sample was split into the 9 different industry divisions to examine whether the M&A impact on the acquiring firm's financial performance varies in these specific industries.

In Panel A of Table 4.7, the Current Ratio, from 8 out of 9 industry divisions are negatively impacted by the M&A deals. The coefficients of Transportation (-0.598) and Wholesale Trade (-0.379) are significantly negative, indicating that M&A deals decreased the acquiring firm's financial performance in these industry divisions. Conversely, these deals had a significant positive impact on the Current Ratio in the Construction industry, meaning that M&A increased the acquiring firm's financial performance in this industry.

Panel B reports that 7 out of 9 industry divisions reported a significant increase in the Debt-to-Equity ratio after M&A deals. Acquiring firms in the Manufacturing (0.034) and Transportation

(0.024) industry had a significantly higher DE ratio, insinuating that these firms increased their debt usage relative to equity usage to finance their assets. As stated by Maverick (2021), Debt-to-Equity ratios differ across industries as some industries may be more capital-intensive compared to others. For instance, industries, such as manufacturing, reveal higher DE ratios as it can be classified as a capital-intensive industry, therefore using a high degree of leverage funding to generate profit. On the contrary, the acquiring firms in the Mining industry (-0.077) reveal a significant decrease in the Debt-to-equity ratio after M&A deals.

As shown in Panel C, the EPS for acquiring firms in the Manufacturing (0.597) and Services (1.68) industry, has significantly increased during the post-M&A period. These findings indicate that M&A transactions have positively impacted the shareholder's value in these three industry divisions. This confirms that the EPS is solely positively impacted by the M&A deals, which is consistent with the results in Column (6) of Table 4.5 and the study by Harvey (2015) who reveals that acquisitions significantly increases the Earnings per Share and Dividends per Share.

Table 4.7. Industry division-level analysis on the M&A impact on CR, DE, and EPS

Panel A: CR		**Panel B: DE**		**Panel C: EPS**	
Industry Division	**M&A-coefficient**	**Industry Division**	**M&A-coefficient**	**Industry Division**	**M&A-coefficient**
Agriculture	-.912	Agriculture	-.017	Agriculture	-16.3*
Construction	.013*	Construction	.011	Construction	-1.01
Manufacturing	-.064	Manufacturing	.034***	Manufacturing	.597**
Mining	-.171	Mining	-.077*	Mining	-.808
Public Administration	-.312	Public Administration	.011	Public Administration	8.61
Retail Trade	-.032	Retail Trade	.025	Retail Trade	1.43
Services	-.179**	Services	.006	Services	1.68***
Transportation	-.598***	Transportation	.024**	Transportation	.545
Wholesale Trade	-.379***	Wholesale Trade	.006	Wholesale Trade	-.807
Obs.	2,488		2,488		2,488
Time FE	Yes		Yes		Yes
Industry FE	Yes		Yes		Yes

Note. This table contains panel regressions with the sample being divided by different industry divisions. Financial performance is measured using three indicators, namely CR, DE, and EPS. The sample contains 311 acquiring firms for the period 2015-2022. ***p<0.01, **p<0.05 and *p<0.10

Surprising results are revealed in Table 4.8, as Panel A reports that acquiring firms in the Manufacturing (-0.017), Public Administration (-0.482) and Transportation (-0.098) industry are

significantly negatively impacted by the M&A deals with NPM as the financial performance indicators. Whereas these deals had a significant positive impact on the financial performance of firms in the Mining (0.320) industry in terms of NPM. An explanation for this positive M&A impact for firms in the mining industry could be that these transactions generate economies of scale as combining resources and skill can come with improved efficiency and relatively lower costs (Campbell, Lewis, & Tivey, 2023).

Moreover, Panel B reveals that acquiring firms in the Manufacturing (-0.022), Services (-0.030) and Transportation (-0.029) industry are significantly negatively impacted by M&A deals with ROCE as the financial performance proxy. An explanation for this negative impact for acquiring firms in the manufacturing industry could be due to the growing awareness of climate change. As the manufacturing industry contributes to 33% of the global carbon emissions, firms are attempting to move to a low-carbon system (Duvigneau, 2022). This move regarding a better climate can cause uncertainties and higher costs for acquiring firms in this specific industry division and therefore making it more challenging to reach certain profitability objectives. On the other hand, the financial performance of acquiring firms in the Wholesale Trade (0.038) industry seems to be significantly positively impacted by these deals.

Overall, the M&A impact on the acquiring firm's financial performance experience industry division heterogeneity since the financial performance significantly differs across these industries. These findings support hypothesis H3 and are consistent with the study of Mantravadi and Reddy (2008) as they reveal that varying industry types leads to differing impacts on the post-merger financial performance of acquiring firms in India.

Table 4.8. Industry division-level analysis on the M&A impact on NPM, ROCE, and ROA

Panel A: NPM		**Panel B: ROCE**		**Panel C: ROA**	
Industry Division	**M&A-coefficient**	**Industry Division**	**M&A-coefficient**	**Industry Division**	**M&A-coefficient**
Agriculture	-.220	Agriculture	-.865	Agriculture	-.672
Construction	.002	Construction	.035	Construction	.013
Manufacturing	-.017**	Manufacturing	-.022***	Manufacturing	-.016***
Mining	.320***	Mining	.077	Mining	.082*
Public Administration	-.482***	Public Administration	-.065	Public Administration	.005
Retail Trade	.003	Retail Trade	-.021	Retail Trade	-.009
Services	.014	Services	-.030***	Services	-.021***
Transportation	-.098***	Transportation	-.029***	Transportation	-.010
Wholesale Trade	.004	Wholesale Trade	.032*	Wholesale Trade	.014
Obs.	2,488		2,488		2,488
Time FE	Yes		Yes		Yes
Industry FE	Yes		Yes		Yes

Note. This table contains panel regressions with the sample being divided by different industry divisions. Financial performance is measured using three indicators, namely NPM, ROCE, and ROA. The sample contains 311 acquiring firms for the period 2015-2022. ***p<0.01, **p<0.05 and *p<0.10

4.3.4. Fourth Hypothesis Analysis

The impact of M&A deals on the ESG performance of acquiring firms and whether this impact differs for larger firms is investigated to test the fourth hypothesis, namely H4a and H4b. Table 4.9 reports fixed-effect panel regressions with the ESG performance measures as the dependent variables, an M&A dummy and six control variables. In addition, Column (2) includes an interaction term between the M&A and SIZE variable to investigate the underlying M&A impact. Column (1) and Column (2) show that the coefficient for M&A is 17.3 and 45.3, which are both significant at the 1% level. When the M&A dummy equals 1 (thus the period after M&A deals), the ESG combined score will increase by 17.3. Moreover, the individual pillar scores, namely environmental, social and governance scores, are also positively impacted by M&A deals, as significant positive coefficients for the M&A variables are reported. These positive coefficients indicate that M&A deals have a positive impact on the ESG performance of acquiring firms in the United States, which is in line with hypothesis H4a. Similar results were revealed by extant studies who asserted that M&A transactions tend to increase the ESG scores of both the acquiring firms and the target firms for the period after these deals have taken place (Barros et

al., 2022; Caiazza et al., 2021). A possible explanation for this positive impact could be that companies participating in M&A transaction are more plausible to go through inspections by the government and their customers, which could encourage these companies to integrate sustainability into their decision-making processes (Carnes, Christensen, & Lamoreaux, 2019). Regarding the size of firms, Column (1), Column (2) and Column (5) report a significant positive SIZE coefficient, indicating that larger firms contribute to a higher ESG performance. For instance, in Column (1) the coefficient is 3.51, which means that if the size of a firm increased by 1%, the ESG combined score would increase by 3.51. A potential explanation for this positive relation could exist as larger companies tend to have access to more resources and capital; therefore, it is more plausible to initiate sustainable operations in comparison to smaller companies (Jones, 2021). These operations can improve the representation of the company in the mind of customers and shareholders, while at the same time enhancing the accessibility of resources for everybody (Priya, 2022).

Concerning Column (2), the interaction coefficient between the M&A dummy and SIZE is -3.11 with a significance at the 1% level. This interaction term insinuates that the difference between the ESG scores, before and after the M&A deals, significantly decreases as the firm size increases. In other words, the positive M&A impact on the ESG performance of acquiring firms in the United States weakens as the size of the firms increases. Leaving other variables constant, increasing the size of the firm by 1%, will lead to an M&A impact of 35.3 – 3.11*1= 32.19. In addition, the interaction coefficient is also negative with the social score and governance score as the dependent variables, insinuating that the social and governance score significantly decreases after the M&A deals as the size of the firm enlarges (See Appendix E, Table E1). These findings support hypothesis H4b and are consistent with extant studies who investigated whether the size of a firm partaking in M&As leads to differing performance effects (Arvanitis & Stucki, 2015; Moeller et al., 2004). It was revealed that large acquiring firms have approximately 2% lower announcement returns compared to small acquiring firms and SMEs were positively impacted after the M&A deals as three performance proxies increased. A reason larger acquiring firms weaken the positive impact on the ESG score could be that larger firms have

high free cash flows which could cause the management to make below par M&A decisions instead of increasing the shareholder's payout (Byun & Ahn, 2007).

Table 4.9. Regression results of the M&A impact on the acquiring firm's ESG performance

	ESG		**Environmental**	**Social**	**Governance**
Variables	(1)	(2)	(3)	(4)	(5)
M&A	17.3*** (6.75)	45.3*** (8.95)	21.1*** (7.46)	22.8*** (8.70)	11.5*** (4.47)
M&A*SIZE		-3.11*** (-5.70)			
SIZE	3.51* (1.95)	4.57*** (2.72)	1.30 (0.61)	2.55 (1.10)	3.83* (1.90)
DE	2.46 (0.57)	.541 (0.13)	1.16 (0.21)	-2.03 (-0.46)	2.76 (0.53)
ROA	-6.31 (-0.56)	-4.41 (-0.45)	-23.9* (-1.94)	-17.4 (-1.61)	-10.6 (-1.09)
CR	.070 (0.12)	.048 (0.08)	.387 (0.68)	.479 (0.65)	.786 (0.91)
TANG	.422 (0.03)	-.133 (-0.01)	9.84 (0.64)	12.6 (0.98)	-5.48 (-0.47)
MA activity	-.405 (-0.99)	-.238 (-0.60)	.194 (0.40)	.182 (0.54)	-.023 (-0.39)
Constant	10.7 (0.67)	1.88 (0.13)	16.4 (0.83)	19.5 (0.92)	18.5 (1.06)
R-squared	0.774	0.781	0.860	0.830	0.744
Obs.	956	956	956	956	956
Time FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes

Note. This table reports fixed-effect panel regressions where the dependent variable equals the ESG combined scores of the acquiring firms in Column (1) and with size as the moderating variable in Column (2). Column (3) includes the environmental pillar score as the dependent variable, Column (4) the social pillar score and Column (5) the governance pillar score. The sample contains 134 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

5. Robustness Analysis

To assess the reliability of this study's findings using fixed-effect panel regressions, a second regression method will be used as a robustness test for Hypothesis H1 and H4. Table 5.1 and Table 5.2 report Pooled OLS (Ordinary Least Square) regressions to uncover potential weaknesses of this research.

5.1. Alternative Regression Method

The regression method is switched from fixed-effect panel regressions to pooled OLS regressions for Hypothesis H1 and H4 to analyze the performance and robustness of the baseline regression models. Clustered standard errors are included in the Pooled OLS regression model to consider the panel data structure.

Column (2) shows that the M&A coefficient is -0.031 with a significance level at 1%. This indicates that the ROCE significantly decreased by 0.031 after the M&A deals, leaving other variables constant. Furthermore, in Column (5) the M&A coefficient with DE as the financial performance indicator is 0.039, indicating that the Debt-to-Equity ratio significantly increased during the post-M&A period. These findings insinuate that the profitability position decreased, and the leverage position of the acquiring firms in the United States increased, which is consistent with the main results reported in Table 4.5.

In addition, Column (6) shows that the Earnings per Share (EPS) are positively impacted by the M&A deals, as the coefficient equals 0.893. Accordingly, the impact of M&A deals on the financial performance of acquiring firms seems to obtain similar after changing the regression method, which affirms that this study's results are robust and consistent across a different estimation method.

Table 5.1. Alternative regression method for Hypothesis H1

	NPM	**ROCE**	**ROA**	**CR**	**DE**	**EPS**
Variables	(1)	(2)	(3)	(4)	(5)	(6)
M&A	-.009 (-0.77)	-.031*** (-4.38)	-.013*** (-2.76)	-.062 (-1.18)	.039*** (7.33)	.893*** (4.86)
SIZE	.038*** (5.86)	.021*** (4.83)	.017*** (5.09)	-.068** (-2.04)	-.011*** (-2.85)	.942*** (9.49)
CASH	-.252* (-1.70)	-.115 (-1.51)	-.124* (-1.88)	5.56*** (7.80)	.118** (1.98)	-2.61** (-2.05)
EA	.100** (2.26)	.038 (1.35)	.051** (2.36)	-.532** (-1.97)	.188*** (5.54)	-.117 (-0.14)
SOL	-.149*** (-3.14)	.037 (1.02)	-.035 (-1.42)	-3.29*** (-9.03)	.908*** (27.30)	-2.62*** (-2.69)
MA activity	-.002 (-0.56)	.004 (1.84)	.009 (0.47)	.038** (2.09)	-.005** (-2.13)	-.192*** (-3.03)
Constant	-.166** (-2.60)	-.032 (-0.80)	.018 (0.55)	4.21*** (10.66)	-.181*** (-5.44)	-3.23*** (-3.65)
R-squared	0.127	0.121	0.116	0.491	0.708	0.134
Obs.	2,488	2,488	2,488	2,488	2,488	2,488
Time FE	No	No	No	No	No	No

Note. This table shows pooled OLS regressions with six financial performance indicators: NPM, ROCE, ROA, CR, DE, and EPS. The sample contains 311 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

Looking into Column (1) and Column (2) of Table 5.2, the coefficients for M&A are 7.21 and 31.1 with a significance level at 1%. Indicating that if the M&A dummy equals 1, the combined ESG score will increase by 7.21 and 31.1, leaving other variables constant. Similar findings are reported in Columns (3)-(5), as the M&A coefficients are significantly positive at the 1% level with the individual pillar scores as the dependent variables, which insinuates that the impact of M&A deals on the ESG performance of acquiring firms remains consistent after a change in regression method.

Moreover, Column (2) reports the interaction coefficient between the M&A dummy and SIZE variable, which equals -2.80 with a significance at the 1% level, while the M&A coefficient equals 31.1. Additionally, a negative interaction coefficient is also reported for the regressions with social and governance score as the dependent variables (See Appendix E, Table E2). These findings insinuate that the positive M&A impact on the ESG performance weakens as the size of the acquiring firms in the United States increases.

These results are like the main results shown in Table 4.9, confirming the robustness of Hypothesis H4a and H4b. However, the magnitude of this M&A impact is significantly lower for the sustainability performance indicators, as Table 4.9 reports that the combined ESG scores will increase by 17.3 instead of 7.21. Additionally, the M&A activity coefficient is significantly

negative at the 1% level in all columns, insinuating that the more M&A deals the acquiring firms partake in, the lower the ESG performance. This finding is not consistent with Table 4.9, as the M&A activity coefficients are insignificant in all columns.

Table 5.2. Alternative regression method for Hypothesis H4

		ESG	**Environmental**	**Social**	**Governance**
Variables	(1)	(2)	(3)	(4)	(5)
M&A	7.21*** (6.48)	31.1*** (6.28)	9.32*** (5.94)	9.21*** (7.40)	5.72*** (4.16)
M&A*SIZE		-2.80*** (-4.76)			
SIZE	6.77*** (7.69)	8.82*** (8.43)	11.3*** (10.50)	9.04*** (9.72)	6.80*** (7.53)
DE	.162 (0.04)	-.238 (-0.06)	3.16 (0.49)	2.24 (0.41)	-3.99 (-0.88)
ROA	10.3 (0.95)	11.6 (1.08)	7.21 (0.42)	21.1* (1.74)	18.9 (1.43)
CR	.640 (1.11)	.633 (1.10)	.444 (0.49)	1.35 (1.64)	.685 (1.17)
TANG	-11.5 (-2.32)	-11.6** (-2.34)	.600 (0.08)	-5.74 (-0.93)	-18.2*** (-2.98)
MA activity	-2.14*** (-4.72)	-2.14*** (-4.74)	-2.48*** (-4.58)	-2.07*** (-4.08)	-1.57*** (-3.06)
Constant	-17.2** (-2.23)	-34.6*** (-3.91)	-68.3*** (-6.72)	-39.6*** (-4.72)	-4.68 (-0.54)
R-squared	0.296	0.305	0.384	0.360	0.241
Obs.	956	956	956	956	956
Time FE	No	No	No	No	No

Note. Column (1)-(4) reports pooled OLS regressions with ESG combined score and its three pillars as the sustainability performance indicators. The sample contains 134 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.1

6. Conclusion

This present study aimed to examine the impact of M&A deals on the financial performance and sustainability performance of acquiring firms in the United States. A further analysis was conducted by examining whether the impact on the financial performance varied for cross-border relative to domestic M&A deals and comparing the financial performance after these deals across 9 industry divisions.

Leading to the following research question:
What are the long-term impacts of mergers and acquisitions completed in 2017 on the financial performance and sustainability performance of listed acquiring companies in the United States?

To answer the research question, most ESG data and financial data was retrieved from the Refinitiv Eikon database and Wharton Research Data Services (WRDS) for the period 2015-2022, where the two years before 2017 are identified as a pre-M&A period and the 5 years after as a post-M&A period.
Utilizing a sample of 311 acquiring firms, the results in Table 4.5 reported that M&A deals negatively impact the long-term financial performance of acquiring firms in the United States, while at the same time improving the value of the shareholders as the Earnings per Share increased for the period after these deals. The decreasing financial performance after M&A deals was averse to the first hypotheses since it was expected that the financial performance would increase after M&A deals, but this anticipated finding can be caused by the integration problems, cultural challenges, and unreasonable expectations that the firms face after partaking in these deals (Boynton, 2019; Garisson, 2019).
Moreover, this negative impact on the financial performance did not vary depending on whether the M&A deal was cross-border or domestic. In addition, industry division heterogeneity was revealed in Table 4.7 and Table 4.8, since the financial performance differs across industry divisions indicating that the results are consistent with the third hypothesis. As in some industry divisions (Mining and Construction industry) the M&A transactions positively

impacted the financial performance, whereas in other industry divisions (Manufacturing, Transportation and more) the deals had a negative impact on the performance.

Using a sample of 134 acquiring firms, this research disclosed in Table 4.9 that M&A deals positively impacted the ESG performance of acquiring firms in the United States, nevertheless this positive impact weakens as the size of the firm enlarges. These results are consistent with the fourth hypothesis and the literature that firms engaging in M&A deals are more probable to be inspected by the government, which could motivate these firms to incorporate sustainability into their investment decisions and other decisions (Carnes et al., 2019). Furthermore, a reason larger firms have a weakening impact on the performance could be due to the relatively higher free cash flows that larger firms face which could cause the management to make below average M&A decisions rather than increasing the shareholder's pay (Byun & Ahn, 2007).

This paper adds to the existing literature on the impact of M&A deals in many ways. This is the first research that uses panel regressions with multiple control variables, where the financial performance is measured using six accounting-based indicators. Additionally, no preliminary study used listed acquiring companies in the United States to examine the long-term financial performance after M&A deals and investigated whether this impact varies for different industry divisions. Lastly, this is the first study to analyze the relationship between M&A operations and the ESG performance of acquiring firms solely focusing on the United States.

As this research merely focused on M&A deals transpired in 2017, future research could take more deal years into consideration to investigate whether the same impact on the financial performance and ESG performance will hold. The incorporation of more deals years will come with an enlarged number of M&A deals, which can improve the statistical power and generalizability of this study's results. In addition, this study used ESG related measures as sustainability performance indicators, however future studies can include other indicators such as the carbon footprint and energy consumption of acquiring firms to overcome the limitation of this present study.

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Appendices

Appendix A

Percent Histograms of five variables (NPM, ROCE, CR, DE, and EPS)

Note. On the x-axis are the Net profit margin (NPM) values and on y-axis the percentage

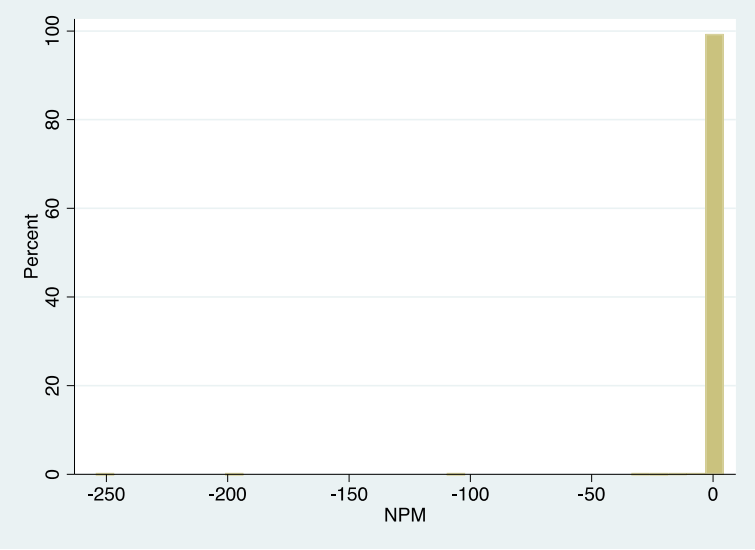

Figure A1. Percent Histogram of NPM values

Note. On the x-axis are Return on Capital Employed (ROCE) values and on y-axis the percentage

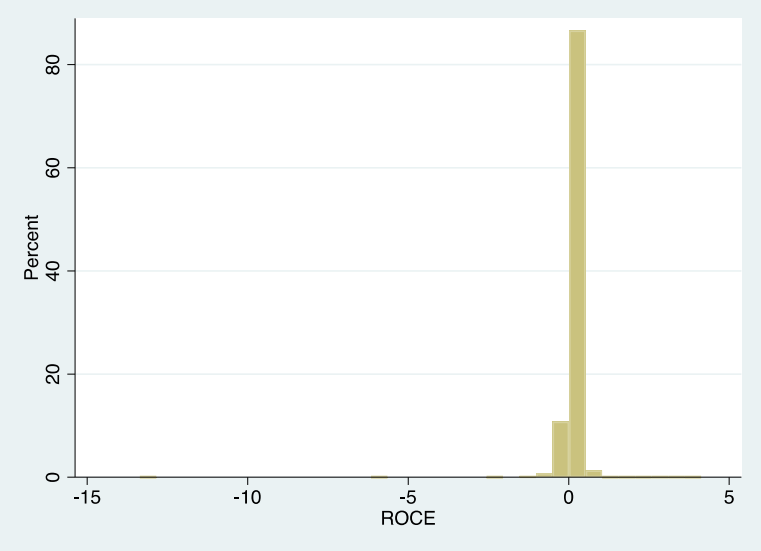

Figure A2. Percent Histogram of ROCE values

Note. On the x-axis are the Current Ratio (CR) values and on y-axis the percentage

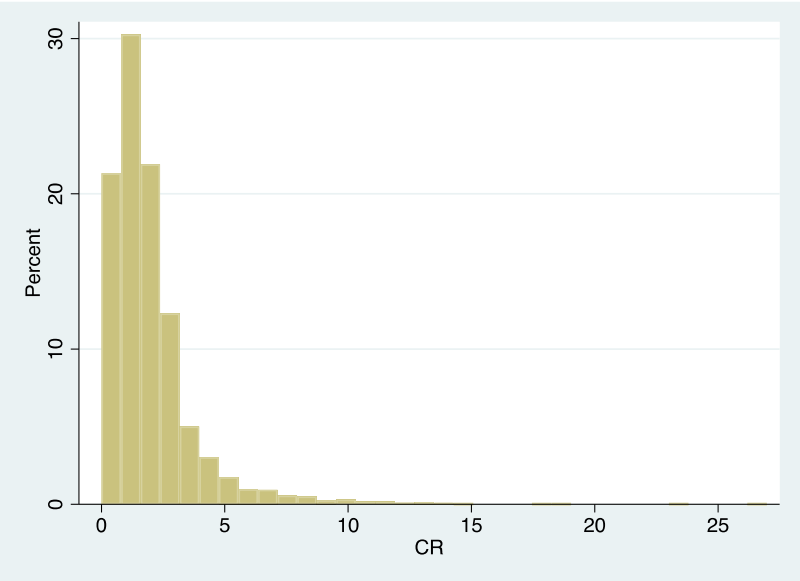

Figure A3. Percent Histogram of CR values

Note. On the x-axis are the Debt-to-Equity (DE) values and on y-axis the percentage

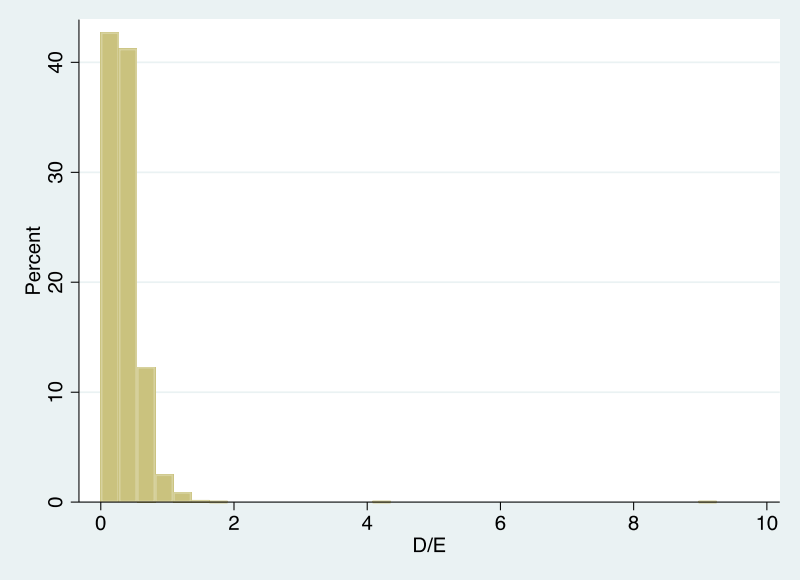

Figure A4. Percent Histogram of DE values

Note. On the x-axis are the Earnings per Share (EPS) values and on y-axis the percentage

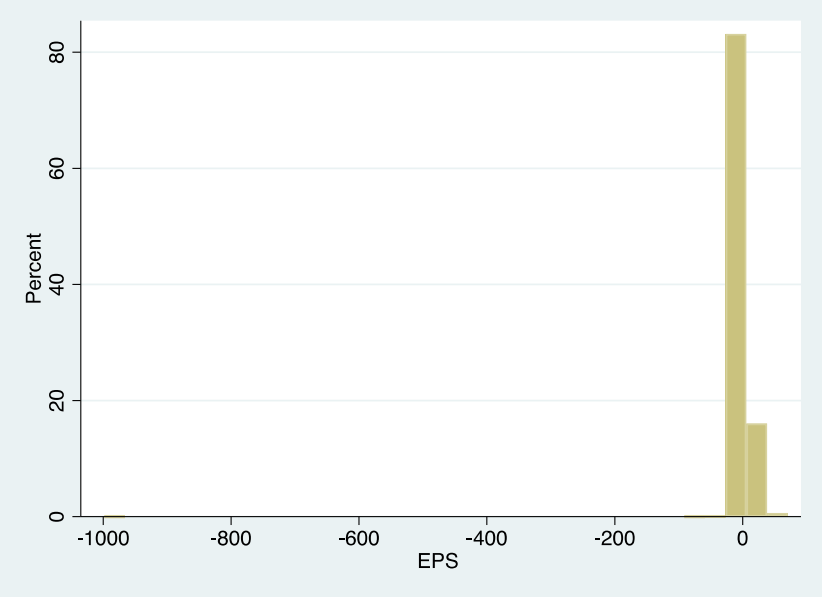

Figure A5. Percent Histogram of EPS values

Appendix B

Correlation Analysis, Stationarity and Heteroskedasticity

Pairwise correlation analysis of all the variables included in the regression models and Variance Inflation Factor (VIF) methods are conducted to detect potential (multi)collinearity. This means that there could be two or more explanatory variables in a regression model that are highly correlated with each other, which could cause the coefficients to be inaccurate and therefore impact the validity of this study's results.

Table B1 reports the pairwise correlation coefficients between all the variables included in the first two regression models (See Section 3.4). If the pairwise correlation coefficients are higher than 0.70, it could be designated that the multicollinearity issue is present in this study's regression models (Shahwan, 2015). However, all the correlations within Table B1 are lower than 0.7, thus this issue is not available within this research. To be sure, the VIF method was also applied where all the values were lower than 5, which certifies that multicollinearity is not present (Zach, 2020).

The correlation coefficient between the ROCE and M&A variable is -0.048 with a significance at the 5% level, instituting a negative relationship between the post-M&A deal period and the financial performance of acquiring firms. The same significant negative correlation between CR and M&A variable (-0.070) is observed, indicating that the period after M&A deals leads to a decrease in the financial performance measured by the Current Ratio.

Conversely, a significant positive correlation coefficient between the DE and the M&A variable of 0.113 was found, meaning the post-M&A period leads to an increase in the Debt-to-Equity ratio. In addition, the correlation coefficient of 0.105 between EPS and the M&A variable is significant at the 1% level, initiating a positive relationship between the post-M&A period and the financial performance measured by the Earnings per Share.

Looking into the control variables, the size of acquiring firms is positively correlated with the financial performance indicators, apart from the Current Ratio, indicating that larger acquiring firms cause the financial performance to increase.

Furthermore, the acquiring firm's exclusive assets are positively correlated with the financial performance indicators, apart from the Current Ratio. So, if the ratio of intangible assets to total

assets increases it will lead to an increase in the Return on Capital Employed, Return on Assets and the Debt-to-Equity ratio.

Table B1. Pairwise correlations for hypothesis H1-H3

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) NPM	1.000											
(2) ROCE	0.658***	1.000										
(3) ROA	0.740***	0.838***	1.000									
(4) CR	-0.123***	-0.156***	-0.127***	1.000								
(5) DE	-0.024	0.134***	0.107***	-0.342***	1.000							
(6) EPS	0.334***	0.347***	0.361	-0.117***	0.044**	1.000						
(7) M&A	0.018	-0.048**	-0.012	-0.070	0.113***	0.105***	1.000					
(8) CROSSBORD	0.027	0.029	0.038*	-0.054***	0.038*	0.053***	0.271***	1.000				
(9) SIZE	0.295***	0.306***	0.289***	-0.357***	0.239***	0.338***	0.099***	0.084***	1.000			
(10) CASH	-0.189***	-0.191***	-0.204***	0.539***	-0.227***	-0.132***	-0.060***	0.036*	-0.301***	1.000		
(11) EA	0.116***	0.078***	0.123***	-0.176***	0.223***	0.010	0.069***	-0.004	0.024	-0.205***	1.000	
(12) SOL	0.020	0.186***	0.083***	-0.585***	0.816***	0.043**	0.055***	0.041**	0.390***	-0.316***	0.071***	1.000

Note. This table reports all the pairwise correlation coefficients between two variables used for the first two regression models (thus not regression models 3 and 4). * Means significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level

On the other hand, Table B2 displays the pairwise correlation coefficients between all the variables used in the third regression model (See Section 3.4). Like Table B1, multicollinearity is also not an issue within this model as both the correlation coefficients between independent variables are lower than 0.7 and the VIF values are lower than 5.

The correlation coefficient between the ESG combined score and M&A variable is 0.184 with a significance at the 1% level. This positive correlation is also visible between the individual pillar scores (environmental, social and governance score) and the M&A dummy, indicating a positive relation between the post-M&A deal period and ESG performance of acquiring firms.

Focusing on the control variables, the size of acquiring firms is highly positively correlated with the ESG score and its pillar scores at the 1% significance level, insinuating that larger acquiring firms lead to an increase in the ESG performance. In addition, this positive relation is also observed between the DE and ESG variable, meaning that an increase in the Debt-to-Equity ratio is followed by an increase of ESG scores.

Conversely, a significant negative correlation coefficient between the CR and ESG of -0.121 was found, these negative correlations are also reported between the CR and individual pillar scores. Insinuating that an increase in the Current Ratio causes the ESG performance to decrease.

Table B2. Pairwise correlations for hypothesis H4

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) ESG	1.000										
(2) Environmental	0.752***	1.000									
(3) Social	0.849***	0.734***	1.000								
(4) Governance	0.687***	0.427***	0.510***	1.000							
(5) M&A	0.184***	0.176***	0.203***	0.130***	1.000						
(6) SIZE	0.491***	0.599***	0.555***	0.428***	0.077**	1.000					
(7) DE	0.105***	0.153***	0.126***	0.041	0.098***	0.210**	1.000				
(8) ROA	0.050	0.022	0.084***	0.082**	-0.071**	0.022	0.055*	1.000			
(9) CR	-0.121***	-0.207***	-0.114***	-0.081**	-0.037	-0.370***	-0.407***	0.072**	1.000		
(10) TANG	-0.036	0.101***	0.039	-0.107***	0.020	0.158***	0.055*	-0.038	-0.105***	1.000	
(11) M&A activity	-0.058*	-0.044	-0.037	-0.027	0.187***	0.021	-0.003	0.042	-0.013	-0.051	1.000

Note. This table reports all the pairwise correlation coefficients between two variables used for the third and fourth regression model. * Means significance at the 10% level, ** indicates significance at the 5% level and *** indicates significance at the 1% level

Furthermore, to guarantee that the data is stationary, meaning that the mean and variance do not vary across time, panel unit root tests were conducted for all variables used in this study. This paper specifically uses the Fisher test where the null hypothesis insists that the panels consist of a unit root (Choi, 2001). After conducting this test for all the variables, the null hypothesis can be rejected at the 1% significance level, indicating that the panels are stationary. In addition, to check whether the variance of the residuals is constant across observations a modified Wald test for groupwise heteroskedasticity was performed (CFI Team, 2023c). The null hypothesis of homoskedasticity can be rejected, insinuating that heteroskedasticity is present in this study's data. To rectify this issue, robust standard errors will be implemented in the Stata format.

Appendix C

Added-Variable Plots

Note. This added-variable plot contains a graphical depiction of the correlation between the M&A and NPM variable with the influence of control variables also being included in the model, such as Table 4.5.

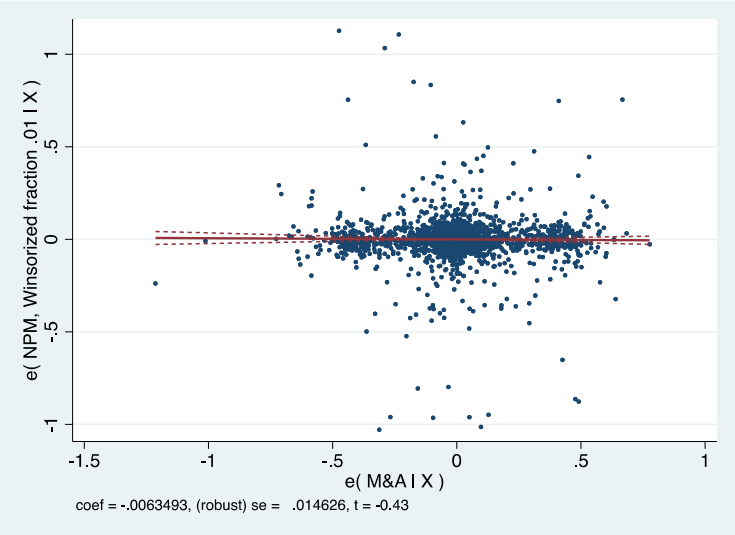

Figure C1. Added-variable plot of M&A dummy and Net profit margin.

Note. This added-variable plot contains a graphical depiction of the correlation between the M&A and ROA variable with the influence of control variables also being included in the model, such as Table 4.5.

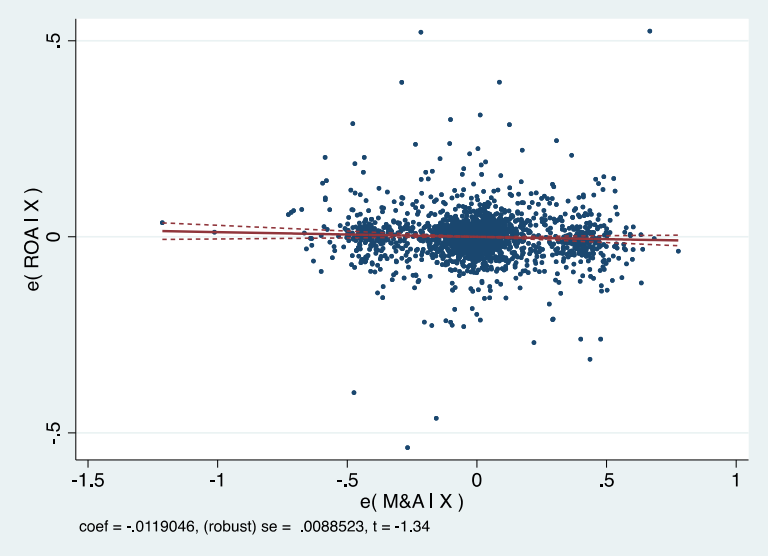

Figure C2. Added-variable plot of M&A dummy and Return on Assets

Appendix D

The M&A impact on the financial performance for each year

Table D1. Regression results for each year (2017-2022)

	NPM	ROCE	ROA	CR	DE	EPS
Fiscal Years	(1)	(2)	(3)	(4)	(5)	(6)
2017	-.003 (-0.29)	-.020*** (-2.83)	-.012** (-2.09)	-.189** (-2.46)	.026*** (2.66)	.892*** (3.33)
2018	-.009 (-0.80)	-.023*** (-3.07)	-.016** (-2.61)	-.222*** (-1.69)	.030*** (2.79)	.966*** (3.38)
2019	-.006 (-0.55)	-.020*** (-2.88)	-.012** (-2.24)	-.201*** (-2.72)	.023** (2.35)	.973*** (3.66)
2020	.001 (0.13)	-.013* (-1.94)	-.008 (-1.48)	-.171** (-2.31)	.024** (2.60)	1.07*** (4.15)
2021	.008 (0.07)	-.016** (-2.25)	-.009* (-1.73)	-.150** (-2.08)	.024** (2.58)	.763*** (3.06)
2022	-.004 (-0.35)	-.019*** (-2.80)	-.012** (-2.17)	-.167** (-2.32)	.024** (2.58)	.715*** (2.90)
Obs.	2,488	2,488	2,488	2,488	2,488	2,488

Note. This table reports fixed-effects panel regressions[9] with six financial performance indicators: NPM, ROCE, ROA, CR, DE, and EPS. The values display the M&A impact (coefficient). The sample contains 311 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

[9] To ensure this table is clear, the values of the control variables are not reported, but they are included in the panel regressions conducted in the Stata framework.

Appendix E

Regressions with interaction term between M&A and the three single ESG score

Table E1. Regression results on the underlying M&A impact of the ESG performance

	Environmental	**Social**	**Governance**
Variables	(1)	(2)	(3)
M&A	25.1*** (2.80)	35.0*** (5.79)	35.2*** (4.95)
M&A*SIZE	-.447 (-0.49)	-1.36** (-2.05)	-2.64*** (-3.44)
SIZE	1.45 (0.70)	3.01 (1.29)	4.72** (2.32)
DE	.884 (0.16)	-2.88 (-0.66)	1.12 (0.21)
ROA	-23.7* (-1.89)	-16.6 (-1.64)	-9.04 (-0.98)
CR	.384 (0.68)	.469 (0.63)	.768 (0.85)
TANG	9.76 (0.63)	12.3 (0.97)	-5.95 (-0.54)
MA activity	.218 (0.44)	.255 (0.73)	-.088 (-0.14)
Constant	15.2 (0.78)	15.6 (0.73)	11.0 (0.63)
R-squared	0.860	0.830	0.749
Obs.	956	956	956
Time FE	Yes	Yes	Yes

Note. This table reports fixed-effect panel regressions where the dependent variables are the environmental, social and governance pillar scores with SIZE as the moderating variable. The sample contains 134 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10

Table E2. Regression results on the underlying M&A impact of the ESG performance

	Environmental	**Social**	**Governance**
Variables	(1)	(2)	(3)
M&A	8.73 (1.14)	17.6*** (2.79)	27.9*** (3.78)
M&A*SIZE	.069 (0.08)	-.982 (-1.33)	-2.62*** (-3.12)
SIZE	11.3*** (9.34)	9.76*** (8.49)	8.72*** (9.54)
DE	3.17 (0.49)	2.10 (0.39)	-4.36 (-0.94)
ROA	7.18 (0.42)	21.6* (1.77)	20.3 (1.51)
CR	.444 (0.49)	1.35 (1.64)	.679 (1.15)
TANG	.603 (0.08)	-5.78 (-0.94)	18.3*** (-2.99)
MA activity	-2.48*** (-4.58)	-2.07*** (-4.07)	-1.57*** (-3.00)
Constant	-67.9*** (-5.99)	-45.7*** (-4.49)	-20.9** (-2.48)
R-squared	0.384	0.345	0.247
Obs.	956	956	956
Time FE	No	No	No

Note. This table reports pooled OLS regressions where the dependent variables are the environmental, social and governance pillar scores with SIZE as the moderating variable. The sample contains 134 acquiring firms for the period 2015-2022. The t-statistics are displayed in parenthesis. ***p<0.01, **p<0.05 and *p<0.10