Corporate Restructuring and Environmental, Social, and Governance Improvement

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Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy in Finance

under the supervision of Associate Professor Gerhard Van de Venter, Professor David Michayluk, and Dr. Scott Walker

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February 2024

Certificate of Original Authorship

I, *Thanh Duy Nguyen*, declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Finance, in the *UTS Business School* at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Date: 15 February 2024

Acknowledgments

First and foremost, I would like to express my deepest gratitude to my supervisors—Associate Professor Gerhard Van de Venter, Professor David Michayluk, and Dr. Scott Walker—for all of their sharing, guidance, and encouragement. I highly appreciate their insightful comments on my work, which helped me comprehend my thoughts and sharpen my arguments throughout the papers. The skills and knowledge that I have acquired under their supervision are of great value to my professional career. I am additionally grateful that they all love Vietnamese food and coffee!

Second, I am thankful to all the administrative staff at the UTS Finance Department for their continuous support. I would like to thank Andrea Greer, Chloe Qu, and Stephanie Ough for arranging my teaching and conference attendance. I also greatly appreciate the IT-related help from Duncan Ford. I extend my thanks to Associate Professor Christina Sklibosios for providing substantial assistance to myself and all the other Ph.D. students.

Third, I dedicate my Ph.D. to my beloved family. I am indebted to my parents and younger sisters for always entertaining and encouraging me and providing me with unconditional support. To my not-perfect-but-incredible wife, I am grateful to her for being a great listener, a fantastic life discussant, and a five-star chef during our time in Australia. To my amazing Ni Ni, her arrival on earth makes her daddy's Ph.D. journey more intense but worth experiencing.

Last, as the journey comes to an end, I would like to take this opportunity to say a big thank you to myself. I thank myself for working so hard—from not having any ideas about ESG to acquiring a massive understanding of the field. I thank myself for being resilient in dealing with all the ups and downs during my journey.

Preface

There are three papers incorporated in this thesis:

1. "Improvement in Sustainability: Evidence from the Mergers and Acquisitions Market"

2. "Trust Me, I'm Going Green: Greenwashing Through Mergers and Acquisitions"

3. "Socially Responsible Investing Fund Ownership and ESG Performance: Evidence from U.S. Spin-offs"

These papers have been significantly improved through insightful and thorough comments from reviewers, discussants, and participants at the Australasian Finance and Banking Conference, the New Zealand Finance Meeting, the Southwestern Finance Association Conference, the Asian Finance Association Annual Conference, University of Technology Sydney, University of Newcastle, University of Wollongong, and University of Western Sydney.

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List of Abbreviations

2SLS	Two-stage Least Squares
Adj. R^2	Adjusted R-squared
ESG	Environmental, Social, and Governance
ESGC	ESG Combined Score
FE	Fixed Effect
M&As	Mergers and Acquisitions
Obs.	Observations
OLS	Ordinary Least Squares
SDC	Thomson Securities Data Company Platinum Mergers and Acquisitions Database
SEC	Securities and Exchange Commission
SIC	Standard Industrial Classification
SRI	Socially Responsible Investing
U.S.	United States of America

Abstract

This thesis comprises three studies that relate to the improvement of a company's environmental, social, and governance (ESG) practices via corporate restructuring: Mergers and acquisitions (M&As) and spin-offs.

The first study examines an acquirer's ESG improvement via M&As. I document that the relative ESG ratings of targets positively impact acquirers' ESG improvements post-merger. Among the three components of an ESG rating, acquirers' environmental rating displays the largest increase. In addition, acquiring targets across borders and in the same industry maximizes acquirers' ESG improvement post-merger. I also find that although acquirers pay higher bid premiums to targets with higher relative ESG ratings, those acquirers create additional value for shareholders by improving their financial performance post-merger. This study suggests that acquiring a better ESG target to transform a firm's ESG practices serves as a sensible strategy.

The second study investigates if acquirers engage in M&As as a greenwashing activity to mislead the market. I propose a novel measure of the extent of greenwashing by using ESG controversies scores. I find that acquirers who engage in higher levels of greenwashing pre-merger acquire targets with higher relative ESG ratings and these deals are associated with lower announcement-period returns. I also document evidence of a decrease in the acquirers' extent of greenwashing post-merger. These findings suggest that, although the market may initially be skeptical of the deals, acquirers eventually adopt more sustainable practices and make a genuine effort to "go green". M&As can help a company in its transition toward being more sustainably conscious, but they cannot be used as a shortcut to greenwash as it takes time to improve its reputation from previous bad behavior.

The third study investigates whether a firm transforms its ESG performance via another corporate restructuring activity—spin-offs. I provide evidence that a firm's SRI fund ownership pre-spin-off positively impacts its ESG performance post-spin-off. The ESG proposals proposed by SRI funds function as a mechanism to facilitate such spin-offs. I also find that the relationship between SRI fund ownership pre-spin-off and

corporate ESG performance post-spin-off is more pronounced when a firm faces larger financial constraints, has a lower ESG combined score pre-spin-off, and operates in an ESG-sensitive industry. Following ESG improvements post-spin-off, a firm's SRI fund ownership increases significantly. These findings are significant as they indicate that spin-offs can be used as a strategy to improve ESG performance and attract more SRI capital.

Overall, these studies contribute to the understanding of corporate restructuring as an alternative strategy to improve a firm's ESG practices, the market's response to such deal announcements, and factors that maximize ESG improvement.

Chapter 1

Introduction

1.1.   Background and research motivation

Stakeholders have increased their demand for ESG factors over the last several decades. ESG practices provide firms with several financial benefits and tools for risk mitigation. With regard to the stakeholder-focused theory, well-performing ESG practices enhance corporate reputation (Branco & Rodrigues, 2006), innovation capacity (Phillips & Zhdanov, 2013), and investment efficiency (Benlemlih & Bitar, 2018; Xie et al., 2019). Good ESG practices also reduce firms' information asymmetry (Hamrouni et al., 2019), cost of capital (Fatemi et al., 2015), and facilitate their access to external financing sources (Cheng et al., 2014). Just like an insurance-like protection, engaging in good ESG practices helps firms deal with various emerging risks, such as climate change and data security, lowers downside risks (Broadstock et al., 2021), and reduces the volatility of earnings (Amel-Zadeh & Serafeim, 2018).

With the emergence of this ESG demand, sustainable investing[1] has gained mainstream importance. This investment strategy takes into account ESG factors during asset allocation to sustain long-term financial returns. The Global Sustainable Investment Alliance reports that global sustainable investing increased from US$13.261 billion in 2012 to US$35.3 billion in 2020, accounting for 35.9% of total assets under management (AUM). In addition, driven by the interest in ESG, the public sector, including central banks, has been transitioning the financial system toward greener and low-carbon economies (Boffo & Patalano, 2020). Such economies commit to incorporating ESG assessment into their strategies, such as reserve management and supervisory practices.

Firms under pressure from stakeholders to develop strong ESG policies need to transform their ESG performance. However, self-investment in ESG practices may cause

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[1] The terms sustainable investing, SRI, impact investing, and ESG investing are often used interchangeably.

an issue of ESG overinvestment, which is costly for shareholders (Barnea & Rubin, 2010). The agency problem—the conflict between the interest of shareholders (principals) and managers (agents)—often leads to an overinvestment in ESG by managers. Serving the stakeholders' interest at the shareholders' expense, managers tend to overinvest in ESG to gain a higher personal reputation among non-shareholder stakeholders. Due to the detrimental effect of ESG overinvestment on shareholders' value, seeking alternative strategies to improve a firm's ESG performance is essential.

As a strategic response to changes in market conditions, corporate restructuring could serve as an alternative strategy to meet sustainability demands from stakeholders. Corporate restructuring is the process of making significant changes to the organizational structure, operations, or ownership of a company to improve its financial performance, operational efficiency, or strategic direction. Corporate restructuring includes various activities, such as M&As, divestitures, spin-offs, and changes in management. External factors—such as changes in industry dynamics, competitive pressures, regulatory requirements, and economic conditions—drive corporate restructuring. Corporate restructuring enables firms to streamline operations, optimize capital allocation, and enhance shareholder value. To improve ESG performance, firms need to efficiently allocate resources to ESG activities and optimize the execution of ESG policies. Consequently, corporate restructuring appears to be a feasible alternative to achieve such an improvement.

1.2.   Research scope and contributions

This study investigates whether two forms of corporate restructuring—M&As and spin-offs—serve as viable alternative strategies to improve a firm's ESG performance. An acquisition refers to when one company purchases a part or all of another company. In contrast, a merger involves one company absorbing another, thereby resulting in only one surviving entity after the transaction. The learning hypothesis proposed by Aktas et al. (2011) contends that acquirers could learn targets' ESG practices and experience. In addition, the resource dependence theory by Pfeffer and Salancik (1978) advocates that acquirers could acquire ESG resources from respective targets in order to strategize and transform their ESG practices. Thus, firms may employ M&As to learn and acquire a target's ESG practices in order to improve their own ESG performance.

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In contrast to M&As, a spin-off is a strategic action through which a parent firm divests its units to focus on its core businesses (CFA Institute, 2022). Spin-offs assist firms to clarify their corporate strategies to the market in addition to reducing information asymmetry (Bergh et al., 2008). Firms may divest poorly rated ESG units, thereby sharpening the parent firms' ESG policies and committing to the emerging ESG demand of their stakeholders. Hence, spin-offs may help firms transform their ESG performance.

In this thesis, chapter 2 explores whether acquirers could improve their ESG performance when acquiring targets with better ESG practices and how to strengthen the ESG improvement post-merger by selecting target industries and countries. Taking into consideration all international M&A deals from 2006 to 2020, I find that acquirers increase their ESG scores post-merger by 0.271 percentage points when acquiring targets with one standard deviation higher relative ESG ratings. Of the three components of an ESG rating, an acquirer's environmental rating displays the largest increase of 0.728 percentage points, with social and governance ratings exhibiting a smaller but still significant post-merger increase. When examining the joint effect (cross border and cross industry), the results reveal an interesting conclusion. All else being equal, cross-border deals that are in the same industry maximize the improvement in the acquirers' post-merger ESG when acquiring targets with higher relative ESG scores. Overall, acquiring targets that have higher ESG ratings and are in the same industry but different countries ideally improves acquirers' ESG performance post-merger.

The findings in Chapter 2 contribute to the traditional literature on M&As and ESG. The findings related to improving ESG via M&As are built on the mechanism of how M&As help acquiring firms to acquire the resources of target firms; such a mechanism is mentioned in traditional M&A literature, such as the organizational learning hypothesis (Aktas et al., 2011) and the resource dependence theory (Pfeffer & Salancik, 1978). Improving acquirers' ESG performance is considered a plus in addition to the other benefits of M&As.[2] This chapter also extends on the Krishnamurti et al. (2021) finding of a trade-off between investment in corporate social responsibility (CSR) and M&As. Firms can employ M&As as a channel to improve their sustainability practices and enhance shareholders' value when acquiring targets with better ESG

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[2] Acquisition of targets' technology (Kwon et al., 2018), increase in innovation capacity (Stiebale, 2016), and higher abnormal returns (Alexandridis et al., 2017).

performance. Moreover, the largest ESG improvement in cross-border and within-industry deals advocates what is studied by Li et al. (2016). Li et al. (2016) find that acquirers can access valuable resources of their foreign targets in cross-border deals, but must deal with cultural differences. However, acquiring firms in the same industry can alleviate such an issue.

Chapter 3 investigates whether greenwashing on the part of acquirers exists in green M&As (deals that involve green targets) and how the market responds to such deals. Greenwashing is the practice of providing stakeholders with misleading information regarding the environmental impact of a firm's operations, products, or services (Delmas & Burbano, 2011). Seele and Gatti (2017) extend this definition by including the market's accusation of misleading information. Measures of the extent of greenwashing in previous studies are various and have several limitations[3], and as a result, I propose the novel measure of using the ESG Controversies Score. I employ a sample of all international M&A deals from 2006 to 2020 and find that acquirers with higher levels of greenwashing pre-merger tend to acquire targets with higher relative ESG ratings. The market then negatively responds to the announcement of such deals. The acquirers' cumulative abnormal returns (CARs) three and five days around the announcement dates are 0.108 and 0.071 percentage points lower, respectively, when their level of greenwashing pre-merger is one standard deviation higher. Although the market perceives such deals as greenwashing around deal announcement dates, I find evidence of a decrease in the extent of greenwashing post-merger of the acquirers. This finding confirms legitimate green transformation of greenwashing acquirers one year after deal announcements.

The findings of Chapter 3 contribute to the current literature on green M&As. The findings reveal acquirers' acquiring behavior (i.e., acquiring targets with higher relative ESG ratings) associated with their extent of greenwashing pre-merger. Based on the organizational learning hypothesis (Aktas et al., 2011) and the resource dependence theory (Pfeffer & Salancik, 1978), the reduction in the extent of acquirers' greenwashing post-merger enriches the literature on the benefits of green deals, such as greater access to resources, lower financial constraints, reduction in tax liability (Li, Xu, et al., 2020),

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[3] The greenwashing measures employed by Yu et al. (2020), Marquis et al. (2016), and Walker and Wan (2012) are subject to the issue of ESG rating disagreement among different ESG providers (Brandon et al., 2021; Jacobs & Levy, 2022), failure to consider the market accusation of a firm's ESG wrongdoing (Seele and Gatti, 2017), and replication, respectively.

and better business model innovation and sustainability (Li, Liu, et al., 2020). In addition, the findings of Chapter 3 shed light on the market's misinterpretation of such deal announcements. The market's negative response is consistent with the finding of Du (2015) and the attribution theory of Parguel et al. (2011). With regard to the attribution theory, due to information asymmetry of deal intentions between acquirers and the market, the market may refer to acquirers' previous greenwashing behavior to interpret the deals. Finally, Chapter 3 proposes a novel measure of a firm's extent of greenwashing, which addresses the limitations of previous measures.

Chapter 4 examines whether SRI funds contribute to the improvement of the ESG practices of firms in their portfolios via the promotion of spin-offs. Dyck et al. (2019) find that SRI funds actively engage firms in their portfolios in an effort to improve their ESG performance via either voting, shareholder proposals, or private engagement. In contrast, Heath et al. (2022) find that SRI investors simply select firms with already sound practices of ESG (selection effect) and do not attempt to change the firms' sustainability behavior (treatment effect). A relatively higher cost of engaging than selecting appears to be the underlying motive behind the selection rather than the treatment effect. Dimson et al. (2015) show that SRI investors' engagement depends on firms' existing corporate governance practices and the cooperation among institutional shareholders. Thus, it is essential to understand such an impact of SRI funds in various contexts. I employ a sample of US spin-offs of poorly rated ESG business units between 2006 to 2020. I provide evidence that SRI fund ownership pre-spin-off positively impacts a firm's ESG performance post-spin-off. A one standard deviation increase in the percentage of SRI ownership one year prior to the spin-off is associated with 3.299 percentage points higher ESG improvement post-spin-off. The ESG proposals proposed by SRI funds function as a mechanism to facilitate such spin-offs. I also find that the relationship between SRI fund ownership pre-spin-off and corporate ESG performance post-spin-off is more pronounced when a firm faces larger financial constraints, has a lower ESG combined score pre-spin-off, and operates in an ESG-sensitive industry. Following ESG improvements post spin-off, a firm's SRI fund ownership increases significantly. These findings are important, as they indicate that spin-offs can be used as a strategy to both improve ESG performance and attract more SRI capital.

The findings of Chapter 4 clarify two different views on the influence of SRI funds

on corporate ESG performance by examining it in the context of spin-offs. Through ESG proposals, SRI funds engage with the firm via a spin-off, divesting poorly rated ESG units. The finding also confirms that spin-offs serve as a channel to improve a firm's ESG practices. In addition, the findings of Chapter 4 enrich the set of moderators that impact the SRI ownership—corporate ESG behavior relation, such as the ESG norms in the country where a firm is located (Dyck et al., 2019), the cooperation among institutional investors, and the current corporate governance practices (Dimson et al., 2015). Moreover, the increase in SRI ownership follows the ESG improvement post-spin-offs. This finding complements the literature on the benefits of good ESG practices, such as higher reputation (Branco & Rodrigues, 2006), lower information asymmetry (Benlemlih & Bitar, 2018; Cui et al., 2018), lower cost of capital (Amel-Zadeh & Serafeim, 2018; Fatemi et al., 2015), and higher institutional ownership (Fu et al., 2020; Liang & Vansteenkiste, 2022).

1.3. Outline of the thesis

The remainder of the thesis is structured in the following manner. Chapter 2 investigates if firms improve their ESG performance by acquiring targets with better relative ESG ratings. Chapter 3 studies the potential of greenwashing when acquirers acquire green targets and how the market responds to such deals. Chapter 4 examines how SRI funds influence the ESG practices of firms in their portfolios in the context of spin-offs. Chapter 5 concludes and presents several future research suggestions.

Chapter 2

Improvement in Sustainability:

Evidence from the Mergers and Acquisitions Market

2.1.   Introduction

Abundant evidence indicates that an emphasis on Environmental, Social and Governance (ESG) practices creates value for all stakeholders. Enhanced ESG practices lead to an improved reputation (Branco & Rodrigues, 2006) and stronger stakeholder commitment (Arouri et al., 2019; Deng et al., 2013). This commitment includes employees, customers (Turker, 2009), and lenders (Hamrouni et al., 2019). A commitment to employee social welfare can boost a firm's level of innovation and reduce costs related to structural changes (Branco & Rodrigues, 2006). Furthermore, customer loyalty reduces earnings volatility (Amel-Zadeh & Serafeim, 2018). High ESG-rated firms provide lenders more non-financial information, thereby reducing information asymmetry and lowering perceived risks (Hamrouni et al., 2019; Yu et al., 2018).

The financial benefits of higher ESG ratings include higher credit ratings (Jiraporn et al., 2014), easier access to external financing sources (Cheng et al., 2014; Cheng et al., 2022), and higher market value (Zhou et al., 2022). These benefits flow through to a lower cost of debt (Houqe et al., 2020), lower cost of equity (Dhaliwal et al., 2011; Ghoul et al., 2011; Ng & Rezaee, 2015), and, consequently, a lower cost of capital (Fatemi et al., 2015). Firms that follow best practices in ESG also create value by enhancing their innovation capacity (Phillips & Zhdanov, 2013) and investment efficiency (Benlemlih & Bitar, 2018; Xie et al., 2019).

A stakeholder-focused perspective additionally highlights the risk mitigation effect of good ESG practices. ESG improvement functions as an insurance-like protection for firms' intangible assets derived from relationships between firms and non-shareholder stakeholders (Godfrey, 2005). Stellner et al. (2015) find that firms with superior social ratings reduce the credit risk associated with high leverage. Further, Broadstock et al.

(2021) show that high ESG-rated firms in China experience lower downside risks, which help them outperform low-ESG-rated peers during the COVID-19 pandemic. Maintaining good ESG practices helps firms deal with various emerging and unprecedented risks, such as a shift in demographics, climate change, and data security. Consequently, firms that engage in good ESG practices reduce their downside risks (Broadstock et al., 2021; Kanamura, 2021) and obtain less volatile earnings (Amel-Zadeh & Serafeim, 2018).

Due to its multiple benefits and increasing awareness among investors, firms have increased their spending globally on improving their ESG practices over the last several years (Garside, 2021). However, this increased investment in ESG-related resources may lead to overinvestment, which is detrimental to firms' shareholders (Barnea & Rubin, 2010). Managers may over-use corporate resources to invest in ESG to improve their reputation (Barnea & Rubin, 2010; Bhandari & Javakhadze, 2017) and hedge the adverse impact of their business decisions (McCarthy et al., 2017) at the expense of shareholders. These actions result in a wealth transfer from shareholders to other stakeholders. One question that arises then is how ESG scores can be improved instead of self-investing in ESG?

A possible alternative to internal ESG improvement is to acquire firms with higher ESG ratings through M&As. Krishnamurti et al. (2021) study that firms need to trade-off between corporate social responsibility (CSR) and M&A investment due to the absence of financial slack (i.e., resource-constrained)—that is, firms cannot undertake M&A deals and self-improve CSR simultaneously. However, I argue that firms can enhance their sustainability practices by acquiring and integrating the good sustainability practices of the targets. In my study, I investigate if acquiring targets with relatively higher ESG ratings is a viable alternative strategy to improve ESG practice instead of self-investment. For example, in 2008, Panasonic Corporation acquired SANYO Electric Co., a firm with a substantially higher ESG rating prior to the deal announcement. As a result, Panasonic's post-merger ESG ratings increased by 26% and 38% one- and two-years post-merger, respectively. By using an international M&A sample from 2006 to 2020, my study attempts to identify whether M&As such as the deal between SANYO and Panasonic are beneficial to the ESG practices of acquiring companies.

An improvement in ESG ratings post-merger is consistent with the resource dependence theory proposed by Pfeffer and Salancik (1978); they argue that firms extract

external resources through M&As, which is expected to then influence acquirers' behavior in the post-merger period. In other words, if an acquiring firm can successfully acquire a target's ESG practice and experience, it will lead to long-term ESG efficiencies. Furthermore, according to the organizational learning approach, when an integration of ESG practices is successful, an acquirer could inherit and ultimately benefit from a targets' ESG-driven values (Aktas et al., 2011; Hitt et al., 1994; Hitt et al., 1997). Consequently, such a strategy is expected to improve an acquirer's ESG scores post-merger.

Through an empirical analysis using the Ordinary Least Squares (OLS) procedure, I find that there is an increase of 0.271 percentage points in acquirers' ESG scores post-merger when acquiring targets with relative ESG ratings that are one unit higher. The result is both statistically and economically significant. This finding remains consistent when employing the Two-Stage Least Squares (2SLS) estimate as a robustness test. In addition, those acquirers experience the largest enhancement in environmental ratings post-merger—0.728 percentage points—among the three components of ESG.

The closet work to my study is Tampakoudis and Anagnostopoulou (2020) who document an increase in acquirers' sustainability performance and market value after acquiring targets with better ESG practices. However, my paper differs from that of Tampakoudis and Anagnostopoulou (2020) in several important ways. First, I argue that, under the organizational learning and resource dependence theories, acquirers could acquire and integrate the ESG practices of target firms to improve their ESG performance post-merger. Therefore, the characteristics of the targets and deals impact what and how the acquirers acquire from the targets (Aktas et al., 2011; Alexandridis et al., 2013). In my estimation models, I additionally control for the characteristics of targets and the M&A deals and include year and industry fixed effects, all of which were not considered in Tampakoudis and Anagnostopoulou (2020).

Second, Thomson Reuters ASSET4 ESG scores employed by Tampakoudis and Anagnostopoulou (2020) use an equally weighted average method, which fails to capture the importance of each category—E, S, and G—in different industries. In addition, the ASSET4 ESG scores are only based on a firm's self-reported information, so they probably do not measure the firm's actual ESG performance (Mobius et al., 2021). I mitigate such limitations by using the ESG combined (ESGC) score from the Refinitiv

ESG database. ESGC measures a firm's ESG practice by assessing its self-reported data combined with ESG scandals reported by the media. ESGC also uses the weights of categories adjusted across industries.

Third, I shed light on how the acquirers' post-merger ESG improvement varies across borders and industries. I document that cross-border and cross-industry deals weaken the positive influence of targets' relative ESG ratings on the acquirers' ESG change post-merger. This finding suggests that the benefits of ESG-driven M&As are not easily transferable across countries and industries. For example, in 2019 Hasbro, Inc., a US based toy manufacturer, acquired Entertainment One Ltd. (eOne), a Canadian producer and distributor of films and television series, with a deal value of $3.8 billion. Although the pre-merger ESG score of eOne was relatively higher than that of Hasbro, the post-merger ESG score of Hasbro decreased by 8.5% in one year. Thus, the weakening effect of cross-border and cross-industry findings are consistent with M&A literature that suggests that cross border and cross industry deals do not create firm value due to either cultural clashes (Björkman et al., 2007; Deng, 2010; Lee et al., 2015) or differences in institutional structures (Lins & Servaes, 1999; Santos et al., 2008).

When examining the joint effect (cross border and cross industry), my results reveal an interesting conclusion. All else being equal, cross-border deals that are in the same industry tend to have the highest improvement in the acquirers' post-merger ESG when acquiring targets with higher relative ESG scores. This suggests that ESG benefits are more easily transferable for same-industry companies, even if they are in different countries. My finding is consistent with those of Li et al. (2016) who report less severe cultural differences in cross-border and same industry deals than other types of deals. Therefore, I conclude that cross-border and same-industry M&As is an optimal strategy for improving acquirers' ESG scores when acquiring targets with higher relative ESG scores.

I also address the following two concerns related to the improvement in ESG ratings of acquirers post-merger. First, I find that improving ESG practices by engaging in M&As enhances shareholders' value. A one unit increase in the ratio of the target's ESG rating to that of the acquirer is associated with a 0.1 percentage point higher bid premium. Moreover, acquirers' financial performance post-merger displays a significant increase. In contrast to Krishnamurti et al. (2021), in which it is suggested that resource-

constrained firms tradeoff between sustainability and M&A investments, my empirical evidence indicates that there is an improvement in both firms' ESG performance and shareholder value when it acquires targets with higher relative ESG ratings. That is to say, my finding suggests a novel strategy that firms can simultaneously improve their sustainability performance via M&As instead of trading off between those two activities. Those M&A deals improve not only the acquirers' sustainability practices but also their financial performance. Second, to address the concern of potential greenwashing, I document improvement in the ESG practices of acquirers post-merger. Their CO_2 emissions, number of reported employee accidents, and the probability of product recall decrease when the targets' relative ESG ratings are higher. Therefore, acquiring a firm with a higher ESG rating can be considered a viable alternative strategy to improve a firm's ESG practices.

My paper makes several contributions to related literature. First, it provides empirical evidence to support the strategy of acquiring targets with a relatively higher quality of ESG practices to improve the acquirer's ESG ratings without the risk of internal ESG overinvestment. The finding is built on the mechanism of how M&As help acquiring firms acquire targets' resources, which is mentioned in the traditional M&A literature, such as the organizational learning perspective (Aktas et al., 2011), the resource-based theory (Pfeffer & Salancik, 1978), and the spillover effect (Boone & Uysal, 2020). I also extend Krishnamurti et al. (2021) finding, thereby confirming the negative association between investment in CSR and M&As. Firms can employ M&As as a channel to improve their sustainability practices when acquiring targets with better ESG performance. Second, while cultural differences impede cross-border M&As (Björkman et al., 2007; Deng, 2010; Lee et al., 2015), I demonstrate that cross-border and same-industry deals maximize ESG improvement.

My findings have several practical implications. Acquiring targets with higher relative ESG ratings serves as an alternative strategy to improve acquirers' ESG ratings. Such a strategy also helps acquirers avoid the issue of overinvestment when they self-invest in ESG policies and practices. Additionally, my paper finds that ESG scores are improved more for M&As that take place with firms located in different countries but in the same industries as the acquiring firms.

The remainder of the chapter is structured in the following manner. Section 2

reviews relevant M&A and ESG literature to form my hypotheses. Section 3 describes the methods employed. Section 4 presents the data analysis and discusses the findings. Section 5 concludes my findings.

2.2. Related literature

2.2.1. The impact of M&As on acquiring firms

A substantial number of studies have illustrated the positive impact of M&As on firm value. According to neoclassical theory, M&As involve the reallocation of firms' assets due to economic, regulatory, and technological turbulence (Ahern & Weston, 2007; Harford, 2005). This strategy enables firms to rapidly extend and improve their capacity if they can address the potential problems of integration (Ahern & Weston, 2007). The resource dependence theory studied by Pfeffer and Salancik (1978) contends that acquiring firms can acquire their targets' resources. In addition, according to the organizational learning theory, learning from targets' experience and practice is also a benefit acquirers can obtain (Aktas et al., 2011). Kwon et al. (2018) show that acquiring firms could acquire beneficial technology and intangible assets from the targets. Consequently, the acquisition then boosts the innovation capacity of acquirers (Stiebale, 2016). Such asymmetric improvement in innovation is due to differences in pre-merger knowledge between firms. Other M&A-driven changes that help acquiring firms create value include economies of scale, economies of scope, managerial skills, customer relationship and globalization. Alexandridis et al. (2017) provide empirical evidence that M&As yield higher abnormal returns for acquirers' shareholders post-2009. The success of such asset reallocation is subject to sufficient capital liquidity in the market (Ahern & Weston, 2007; Harford, 2005).

Another view on M&A activities is the behavioral approach. Ahern and Weston (2007) note that acquirers whose stocks are overvalued acquire undervalued targets by using stock-swap finance. This leads to losses for the shareholders of the target firms. In addition, acquirers who are excessively confident in their target valuation offer target firms higher bid premiums to compete with other competing acquiring firms. Consequently, acquirers' shareholders suffer losses in such deals. In my study, I report that acquirers experience a profitability improvement proxied by Return-on-Equity (ROE) when acquiring targets with higher ROE and ESG performance pre-takeover. My

findings are consistent with the neoclassical theory discussed above.

2.2.2. The impact of the ESG scores of target firms on the post-merger ESG scores of acquirers

Given the positive impact of M&As on firm value, I extend my investigation to the impact of ESG-related benefits obtained through M&As. In other words, can acquiring firms enhance their ESG ratings post-merger? As an alternative to increasing ESG ratings internally, firms can turn to the M&A market to acquire firms with higher ESG ratings. Aktas et al. (2011) find that targets with well-performing E and S create additional intangible assets for firms. As a result, good ESG practice is one of the resources that acquirers could potentially extract from their high-ESG rated-targets through M&As. Acquirers can learn from targets' ESG experience and, consequently, transform their own practice. After successfully integrating targets' ESG practice, acquirers can inherit the stakeholder commitment of the target firms, an intangible asset derived from their ESG performance (Henisz et al., 2014). Boone and Uysal (2020) find that targets with a relatively low environmental reputation have a negative spillover effect on the acquirers' reputation. In the same vein, acquiring targets with high sustainability-related capacity could enhance acquirers' sustainability orientation (Vastola & Russo, 2021). Therefore, acquiring targets with superior ESG practice is expected to enhance acquirers' post-merger ESG performance. Bauer and Matzler (2014) further contend that the complementary differences between acquirers and targets offer valuable resources for redeployment. Those mutually supportive differences provide firms with efficiency synergies and additional value.

If it can be argued that acquirers are capable of learning and acquiring their targets' ESG practices, then the post-merger ESG ratings of acquiring firms could be improved through acquiring targets that follow best ESG practice. From this, I propose the following hypothesis:

Hypothesis 2.1: A target firm's relative ESG score is positively related to the change in an acquirer's pre- and post-merger ESG scores.

2.2.3. Cross-border and cross-industry M&As

Under the organizational learning and resource dependence theories, how the

acquirers improve their ESG performance post-merger via the learning and integrating process is subject to the contexts of the deals. Previous research finds that acquiring targets across borders and industries impacts the integrating process and acquirers' value. Therefore, I examine how the studied relationship varies between cross-border and within-country deals as well as between cross-industry and within-industry deals.

Although cross-border M&As could provide acquirers with target firms' resources in foreign countries, they often lead to destruction in firm value (Li et al., 2016). One reason for this is that cross-border deals cause difficulty of restructuring and corporate control (Osborne et al., 2012). The acquirers exhibit "home bias" which prefers to the targets that are located in the same countries; in other words, the familiarity drives the acquirers' target selection. Another reason is that cross-border M&A deals have higher information asymmetry due to acquirers and targets being in different countries (Cho & Ahn, 2017; Deng, 2007; Luo & Tung, 2007). According to Fama and Jensen (1983), larger information asymmetry leads to agency problems, which in turn is detrimental to firm performance. The acquirer–target relationship effectively turns into a relationship between principal and agent after completion of the deal. In this case, a conflict of interest could prevent acquirers from acquiring their foreign targets' ESG practice.

In addition, cultural differences between acquirers and targets in cross-border M&As has proved to be problematic, as acquirers fail in their attempt to integrate target firms' beliefs and values into their ownership structure (Björkman et al., 2007). Furthermore, the discrepancy in culture can lead to employee resistance (Lee et al., 2015). Therefore, I propose the following hypothesis:

Hypothesis 2.2: The positive relationship between a target firm's relative ESG score and the change in an acquirer's pre- and post-merger ESG scores is weakened in cross-border deals.

As is the case with cross-industry M&As, very little evidence can be found to support value creation for acquiring firms in cross-industry M&As. Lins and Servaes (1999) contend that industry diversification (i.e., cross-industry M&As) is related to the agency problem. In other words, acquirers' managers execute industry diversification without the best interests of shareholders in mind. In addition, power struggles often

emerge among divisions when diversifying across industries (Rajan et al., 2007). Similar to cross-border M&As, cross-industry M&As exhibit evidence of cultural clashes. Hazelkorn et al. (2004) illustrate that the synergies are realized more frequently in same-industry M&As than cross-industry ones. Those challenges may decrease the effectiveness of the acquirers' learning process post-mergers. Hence, I propose the following hypothesis:

> *Hypothesis 2.3*: The positive relationship between a target's relative ESG score and the change in an acquirer's pre- and post-merger ESG scores is weaker for cross-industry deals.

2.3. Methods

2.3.1. Sample description

I obtain data on all international M&A deals from Thomson Securities Data Company (SDC) Platinum Mergers and Acquisitions Database with the following criteria. The completed deals must be announced between January 1, 2006, and December 31, 2020. Both acquirers and targets are listed non-financial companies—that is, I exclude firms with Standard Industrial Classification (SIC) codes from 6000 to 6999. All deal values must be at least US$1 million. I exclude spin-offs, recapitalizations, self-tenders, repurchases, minority stake purchases, acquisitions of remaining interest, exchange offers, and privatizations. The acquirers must own less than 50% of the target's shares before the deal announcement and at least 50% after completing the deal. The application of these criteria leads to an initial sample of 3,863 deals across 36 countries.

This sample is then merged with ESG scores, accounting, and market-based data from Refinitiv for all firms involved in the M&A deals. Acquiring and target firms must have ESG scores recorded in the Refinitiv ESG Database at the end of the calendar year prior to the deal announcement. Acquirers' ESG ratings at the end of the year after the deal announcement must also be available. These filters result in a final sample of 489 deals. This sample size is relatively small primarily due to requiring both the targets' and acquirers' ESG scores at the end of the calendar year prior to the deal announcement. This sample size is consistent with that of Tampakoudis and Anagnostopoulou (2020), who examine sample of 100 European deals from 2003 to 2017.

Appendix 2.1 describes the sample. It is apparent that the number of deals that satisfy all screening criteria increases over time and reaches a peak of 67 deals in 2018. Cross-border deals and cross-industry deals account for 35% and 32% of the entire sample, respectively.

2.3.2. *Variable measures*

2.3.2.1.ESG Ratings

ESG ratings are intended to measure a company's ESG performance. However, Mobius et al. (2021) state that one of the primary limitations of ESG ratings is that they are based on a company's self-disclosed information. ESG ratings also fail to weigh the differential impact of each of the three (E, S, and G) components of an ESG rating. Therefore, an ESG rating alone may not accurately reflect a company's ESG performance.

To better proxy a firm's ESG performance, I follow the approach given by Rajesh and Rajendran (2020) and use the ESG combined (ESGC) scores provided by Refinitiv, whose database covers over 11,000 firms globally since 2002[4]. Assessing over 500 ESG data points that are grouped into 3 pillars (i.e., ESG) and 10 categories, Refinitiv calculates ESG scores measuring a firm's ESG performance, commitment, and effectiveness based on company-reported data. The ESG score is then adjusted with a controversies score, which captures the frequency and severity of the firm's ESG scandals reported by media and other external sources. This discounted score is referred to as the ESGC score, ranging from 0 (worst) to 100 (best). The use of ESGC instead of ESG ratings addresses the limitations of ESG ratings studied by Mobius et al. (2021). Questioning whether a firm's ESGC is a good measure of its sustainability performance, Rajesh and Rajendran (2020) prove a positive and significant relationship between the two variables. They conclude that firms' ESGC scores are accurate indicators and reflections of firms' ESG practices.

2.3.2.2.ESG Combined Score

I calculate the target's relative ESGC score (TRESG) as the ratio of the target's

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[4] I alternatively use the MSCI ESG database as a robustness test. I find that the results remain consistent with the Refinitiv-ESG-based findings. Detailed results are provided upon request.

ESGC score to that of the acquirer at the end of the year, prior to the deal announcement. I also calculate the target's relative Environmental (TRE), Social (TRS), and Governance (TRG) scores in the following manner:

$$TRESG_{t-1} = \frac{\text{TargetESGC}_{t-1}}{AcquirerESGC_{t-1}}$$

$$TRE_{t-1} = \frac{\text{TargetE}_{t-1}}{AcquirerE_{t-1}}$$

$$TRS_{t-1} = \frac{\text{TargetS}_{t-1}}{AcquirerS_{t-1}}$$

$$TRG_{t-1} = \frac{\text{TargetG}_{t-1}}{AcquirerG_{t-1}}$$

The acquirer's post-merger ESGC change (ΔAESG) is the percentage change in the acquirer's ESGC scores at the end of the year after the deal announcement from their ESGC scores at the end of the year before the deal announcement. Similarly, I compute the change in each dimension—Environmental (ΔAE), Social (ΔAS), and Governance (ΔAG) – as follows:

$$\Delta AESG_{t+1} = \frac{\text{AcquirerESGC}_{t+1} - \text{AcquirerESGC}_{t-1}}{AcquirerESG_{t-1}}$$

$$\Delta AE_{t+1} = \frac{\text{AcquirerE}_{t+1} - \text{AcquirerE}_{t-1}}{AcquirerE_{t-1}}$$

$$\Delta AS_{t+1} = \frac{\text{AcquirerS}_{t+1} - \text{AcquirerS}_{t-1}}{AcquirerS_{t-1}}$$

$$\Delta AG_{t+1} = \frac{\text{AcquirerG}_{t+1} - \text{AcquirerG}_{t-1}}{AcquirerG_{t-1}}$$

2.3.2.3.Control variables

I employ a set of control variables at the deal, acquirer, and target levels. I follow the methodology given by Aktas et al. (2011) to account for deal characteristics, such as deal size (DSIZE), deal diversification (DDIV), cross-border deals (DCROSS), deals with multiple bidders (DMUL), cash-offer deals (DCASH), and stock-offer deals (DSTOCK).

I exclude deal attitude, as my sample includes only friendly deals.

Previous literature identifies a number firm-level characteristics that affect a firm's ESG ratings. Drempetic et al. (2020) find that larger-size and higher-leverage firms have more resources to invest in ESG-related activities, thereby improving their ESG ratings. In contrast, Barnea and Rubin (2010), argue that a higher level of leverage may restrict the free cash flow in the hands of firm managers. As a result, this is expected to reduce ESG investment, thereby preventing firms from achieving high ESG ratings. Further, Boateng et al. (2019) show that acquirers with greater prior experience in M&As obtain higher deal value, as they could absorb the targets' resources and capabilities more effectively. Therefore, I further control for acquirers' market capitalization (AMKCAP), total assets (AASSETS), market-to-book ratio (AMTB), leverage (ALEV), and prior M&A experience (AEXP).

M&As assist acquirers in acquiring new resources from their targets. Therefore, I use targets' total assets (TASSETS), market-to-book ratio (TMTB), and historical performance proxied by Return-on-Equity (ROE) as control variables in my study. My study includes cross-border deals and, therefore, I control for the target countries' GDP per capita (TGDPCA) and GDP growth rate (TGDPGR) as potential drivers of growth opportunities for acquirers. The target countries' data of GDP per capita and GDP growth rate are obtained from the World Bank. Appendix 2.2 describes the calculation of each control variable.

2.3.2.4. Moderators

I additionally examine how the cross-border and cross-industry attributes of deals impact the relationship between TRESG and ΔAESG and the relationship in each dimension. Following the methodology given by Baron and Kenny (1986b), I accordingly employ CROSSESG, CROSSE, CROSSS, CROSSG, DIVESG, DIVE, DIVS, and DIVG as moderators. These moderators are calculated in the following manner:

$$CROSSESG = DCROSS \times TRESG \qquad DIVESG = DDIV \times TRESG$$

$$CROSSE = DCROSS \times TRE \qquad\qquad DIVE = DDIV \times TRE$$

$$CROSSS = DCROSS \times TRS \qquad\qquad DIVS = DDIV \times TRS$$

$$CROSSG = DCROSS \times TRG \qquad\qquad DIVG = DDIV \times TRG$$

2.3.3. *Regression models*

The following are my baseline regression models on the post-merger ESG change of the acquirers.

$$\Delta AESG_{i,t+1} = \alpha_0 + \alpha_1 TRESG_{i,t-1} + \alpha_k \sum Controls_{i,t-1} + \gamma + \delta + \vartheta + \varepsilon \qquad (2.1)$$

$$\Delta AESG_{i,t+1} = \alpha_0 + \alpha_1 CROSSESG_{i,t-1} + \alpha_2 TRESG_{i,t-1} + \alpha_3 DCROSS_i +$$
$$\alpha_k \sum Controls_{i,t-1} + \gamma + \delta + \vartheta + \varepsilon \qquad (2.2)$$

$$\Delta AESG_{i,t+1} = \alpha_0 + \alpha_1 DIVESG_{i,t-1} + \alpha_2 TRESG_{i,t-1} + \alpha_3 DDIV_i +$$
$$\alpha_k \sum Controls_{i,t-1} + \gamma + \delta + \vartheta + \varepsilon \qquad (2.3)$$

where i is a respective deal; *Controls* is a vector of control variables introduced in Section 3.2.2 and described in Appendix 2.2; t is the year of deal announcement; γ is year fixed effect; δ is industry fixed effect; ϑ is country fixed effect; and ε is the robust error clustered at the target country level.[5,6]

2.3.3. *Estimation strategy*

I perform several diagnostic tests to determine the appropriate estimation. I first check for multicollinearity issues in the data. Table 2.1 presents the Pearson's correlations among variables. None of the independent variables are highly correlated (all coefficients are less than 0.8); moreover, the variance inflation factors (VIF) of these variables are less than 10. Thus, the potential existence of multicollinearity issues in my dataset is eliminated (Mansfield & Helms, 1982). The correlation between TRESG and ΔAESG in

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[5] The year, industry, and country fixed effects eliminate invariant unobserved heterogeneity from the error terms across years, industries, and countries, respectively.
[6] I argue that targets' ESG scores tend to be correlated with each other within a country due to the impact of legal origins, so I cluster the standard errors at the target country level to account for possible correlation.

Table 2.1 provides initial evidence that acquiring targets with higher relative ESG scores could improve acquirers' post-merger ESG ratings.

Table 2.1. Pearson's correlations among variables and their Variance Inflation Factor (VIF).
This table present the correlation matrix among variables and their VIF. Appendix 2.2 provides definitions of all variables. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	VIF
(1) ΔAESG	1.000									
(2) TRESG	0.453***	1.000								1.18
(3) DSIZE	-0.002	0.013	1.000							2.27
(4) DDIV	-0.214***	-0.043	0.013	1.000						1.09
(5) DCROSS	-0.241***	-0.174***	-0.017	0.083*	1.000					1.11
(6) DMUL	-0.012	0.041	0.120***	-0.034	0.057	1.000				1.04
(7) DCASH	-0.074*	-0.045	-0.166***	0.024	0.050	-0.036	1.000			1.07
(8) DSTOCK	0.034	0.067	0.055	-0.014	0.078*	-0.025	-0.023	1.000		1.03
(9) AMKCAP	-0.176***	-0.183***	0.559***	0.155***	0.094**	0.047	0.010	0.063	1.000	7.48
(10) ALEV	-0.040	0.057	0.193***	0.142***	-0.084*	0.040	-0.035	-0.014	0.153***	1.39
(11) AASSETS	-0.201***	-0.171***	0.493***	0.137***	0.097**	0.059	0.024	0.053	0.711***	7.74
(12) AMTB	-0.010	0.095**	0.114**	0.056	-0.060	-0.015	0.007	0.022	0.162***	1.49
(13) AEXP	-0.011	-0.008	0.128***	-0.033	-0.015	-0.017	-0.002	-0.041	0.272***	1.15
(14) TASSETS	-0.007	0.155***	0.610***	0.017	-0.114**	0.080*	-0.170***	0.087*	0.363***	2.25
(15) TMTB	-0.041	-0.110**	0.116**	0.000	-0.017	0.037	-0.040	0.009	0.139***	1.21
(16) TROE	-0.045	-0.003	0.131***	0.061	-0.078*	0.032	-0.016	0.030	0.098**	1.12
(17) TGDPCAPITA	-0.003	-0.082*	0.058	-0.012	-0.031	0.044	-0.019	0.009	0.038	1.14
(18) TGDPGROWTH	0.027	-0.032	-0.033	-0.117***	0.014	0.033	0.075*	-0.006	-0.004	1.12

Variables	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	VIF
(10) ALEV	1.000									1.39
(11) AASSETS	0.280***	1.000								7.74
(12) AMTB	0.161***	-0.080*	1.000							1.49
(13) AEXP	0.024	0.277***	0.006	1.000						1.15
(14) TASSETS	0.195***	0.469***	-0.051	0.057	1.000					2.25
(15) TMTB	0.135***	0.055	0.096**	0.094**	-0.126***	1.000				1.21
(16) TROE	0.089**	0.045	0.037	0.006	0.128***	0.233***	1.000			1.12
(17) TGDPCAPITA	0.077*	0.009	-0.002	0.106**	-0.100**	0.032	-0.043	1.000		1.14
(18) TGDPGROWTH	-0.083*	-0.072*	0.091**	0.049	-0.060	0.058	0.001	-0.224***	1.000	1.12

Next, I investigate heteroskedasticity by conducting the Breusch-Pagan test (see Breusch and Pagan (1979) for a detailed explanation of the test). Table 2.2 reports that all the regressions of ΔAESG on TRESG, ΔAE on TRE, ΔAS on TRS, and ΔAG on TRG are statistically significant (p-value less than 0.05), thereby rejecting the null hypothesis that the error terms have constant variances. In addition, I employ robust standard errors as suggested by White (1980).

Table 2.2. Breusch-Pagan and Wu-Hausman tests.
This table shows the Breusch-Pagan test to examine the potential of heteroskedasticity. Wu-Hausman test investigates the measurement error (a potential source of endogeneity) of the main independent variable (TRESG) in the study. Appendix 2.2 provides definitions of all variables.

	(1)	(2)	(3)	(4)
Dependent Variable	ΔAESG	ΔAE	ΔAS	ΔAG
Independent Variable	TRESG	TRE	TRS	TRG
Breusch-Pagan Test				
H_0: *The error terms have constant variances*				
Chi squared (1)	108.92	883.33	246.97	144.48
Prob > Chi squared	0.00	0.00	0.00	0.00
Wu-Hausman Test				
H_0: *The independent variable of interest is exogenous*				
F statistic	1.37	1.57	0.07	0.19
p-value	0.25	0.22	0.79	0.67
Employed estimate	OLS	OLS	OLS	OLS

A potential source of endogeneity is measurement error in targets' relative ESG score estimation. Previous literature indicates that several factors may drive firms' ESG ratings, such as the ESG scores in previous years (Bae et al., 2019), the state where a firm's headquarter is located (Rubin, 2008), and the state's religion rank[7] (Deng et al., 2013). Following Hausman (1978), I conduct the Wu-Hausman test to confirm whether TRESG, TRE, TRS, and TRG are endogenous in my regression models. To examine the international sample, I follow the methodology given by Ioannou and Serafeim (2012) and include the level of individualism (INDIVIDUAL) of the countries where the targets are located to identify any exogenous variation in targets' ESG, E, S, and G scores. I obtain the country level of individualism from the Hofstede Insight Database (Hofstede, 1997, 2001). The individualism score ranges from 0 (the lowest level of individualism)

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[7] The ranking is based on the ratio of the number of religious adherents in a firm's state to the total population in that state. A higher ranking exhibits more religiosity.

to 100 (the highest level of individualism).

Table 2.2 presents the result of the Wu-Hausman test with INDIVIDUAL as the instrumental variable. The test's null hypothesis is that the independent variable of interest is exogenous. The rejection of the null hypothesis suggests that the Ordinary Least Squares (OLS) estimate is efficient and consistent to estimate the regression. If the null hypothesis is rejected, the Two-Stage Least Squares (2SLS) estimate should be employed. The p-values of the Wu-Hausman Test across all studied regressions are insignificant and confirm that the target firms' relative ESG scores and scores of each ESG dimension are exogenous in my regressions. Therefore, the OLS estimate appears efficient and consistent in the regressions of ΔAESG on TRESG, ΔAE on TRE, ΔAS on TRS, and ΔAG on TRG. I also perform the 2SLS estimate as a robustness test, which presented in section 2.5.3.

2.4.   Empirical analysis

2.4.1. Data description

Table 2.3 presents statistics regarding deal characteristics. The target firms' mean relative ESG score is 0.84, with a standard deviation of 0.54. Acquiring targets enhance acquirers' post-merger ESG ratings by 13.6%, on average, with a standard deviation of 33%. A few acquirers are reported to have improved their ESG scores up to 150% one year after the deal announcement, while some firms have experienced a decrease of up to 43%. All sampled deals are friendly takeovers (i.e., non-hostile). Approximately 68% of acquirers acquire targets in the same first two-digit-SIC industries. Only 35.2% of deals are undertaken cross borders; 7% percent of deals involve more than one bidder and, thus, the competitiveness in the deals appears low; 6.1% of deals are offered in cash; 0.8% are in the form of a stock offer; and the remaining deals use a combination of both. A stock-swap offer lets the acquirers share the risk of overvaluation with the targets. A very small number of stock-swap-based deals in the sample reveals that the acquirers perceive a low overvaluation risk associated with high-ESG-rated targets (Officer et al., 2009).

Table 2.3. Descriptive statistics.
This table presents the descriptive statistics of the sample including all completed deals from 2006 to 2020. Appendix 2.2 provides definitions of all variables.

Variables	Observations	Mean	Standard Deviation	Min	Max
AASSETS	489	23.084	1.670	19.045	26.416
AEXP	489	0.170	0.376	0	1
ALEV	489	0.562	0.193	0.108	1.112
AMTB	489	3.457	4.772	-10.691	30.291
AMKCAP	489	23.089	1.670	18.831	26.482
ΔAESG	489	0.136	0.330	-0.430	1.503
DCASH	489	0.061	0.240	0	1
DCROSS	489	0.352	0.478	0	1
DDIV	489	0.320	0.459	0	1
DMUL	489	0.070	0.255	0	1
DSIZE	489	7.953	1.444	3.797	11.282
DSTOCK	489	0.008	0.090	0	1
TASSETS	489	21.621	1.560	18.165	25.004
TGDPCA	489	10.751	0.511	7.884	11.318
TGDPGR	489	2.193	1.536	-4.510	7.528
TMTB	489	3.668	6.241	-11.615	46.513
TRESG	489	0.840	0.544	0.070	3.166
TROE	489	0.043	0.441	-2.354	2.118

2.4.2. *Analysis of the TRESG–ΔAESG relationship*

I find that a target's relative ESG score positively drives an acquirer's change in ESG score post-merger. As indicated in column (1) in Table 2.4, TRESG has a statistically significant and positive impact on ΔAESG, with a coefficient of 0.271 and p-value less than 0.01. When acquiring a target with one unit higher relative ESG score, an acquirer adds 0.271 percentage points of its post-merger ESG score compared to the ESG score at the end of the year prior to the deal announcement. TRESG and other control variables explain 29.8% of the variation in ΔAESG. Hence, Hypothesis 2.1 is supported.

A target's score in each dimension of ESG also has a positive impact on an acquirer's post-merger improvement in the score of the respective aspect. The coefficients associated with TRE in column (2), TRS in column (3), and TRG in column (4) are positive and significant, with all p-values less than 0.01. An acquirer's Environmental score increases by 0.728 percentage points after acquiring a target with a one unit higher relative Environmental score. The post-merger increases in an acquirer's social and

governance ratings are 0.244 and 0.250 percentage points, respectively. Noticeably, the Chi Square tests, which examine whether the coefficient of TRE is statistically different from that of TRS and TRG, respectively, have p-value less than 0.05.[8] These results indicate that an acquirer's environmental rating has the largest improvement among three dimensions in the post-deal period. Figure 2.1 illustrates the reported regression results in Table 2.4.

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[8] The Chi Square test between the coefficients of TRE and TRS: $\chi^2(1) = 5.51$, p-value = 0.02;
  The Chi Square test between the coefficients of TRE and TRG: $\chi^2(1) = 5.33$, p-value = 0.02.

Table 2.4. The impact of targets' relative ESG performance on acquirers' ESG improvement one-year post-merger.

This table presents the regressions of acquirers' ESG improvement one-year post-merger on targets' relative ESG ratings. Column (1) shows the regression of ΔAESG on TRESG. Column (2), (3), and (4) display the regressions of ΔAE, ΔAS, and ΔAG on TRE, TRS, and TRG, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). All regressions are estimated by the OLS estimate. Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) ΔAESG	(2) ΔAE	(3) ΔAS	(4) ΔAG
TRESG	0.271***			
	(10.64)			
TRE		0.728***	-0.017	-0.023**
		(6.30)	(-0.76)	(-2.47)
TRS		-0.241	0.244***	0.061**
		(-1.21)	(3.83)	(2.25)
TRG		0.115	0.001	0.250***
		(1.38)	(0.06)	(17.15)
DSIZE	0.028*	0.031	0.024	0.038*
	(1.77)	(0.99)	(0.90)	(1.83)
DDIV	-0.112**	0.059	-0.015	-0.08
	(-2.34)	(0.88)	(-0.25)	(-1.02)
DCROSS	-0.113***	-0.202	-0.125***	-0.014
	(-4.45)	(-1.11)	(-3.08)	(-0.53)
DMUL	-0.02	0.041	-0.053*	0.036
	(-0.44)	(0.31)	(-1.92)	(1.42)
DCASH	-0.057	-0.217	-0.036	-0.021
	(-1.46)	(-1.32)	(-1.01)	(-0.43)
DSTOCK	0.162**	0.127	0.224*	-0.059
	(2.40)	(0.43)	(1.72)	(-0.32)
AMKCAP	0.035	0.099	-0.042	0.048**
	(1.58)	(0.56)	(-1.21)	(2.31)
ALEV	-0.032	-0.61	0.011	-0.095
	(-0.73)	(-0.93)	(0.07)	(-1.17)
AASSETS	-0.056**	-0.109	0.006	-0.029
	(-2.23)	(-1.06)	(0.16)	(-1.12)
AMTB	-0.008***	-0.003	-0.002	-0.001
	(-6.28)	(-0.56)	(-0.69)	(-0.43)
AEXP	0.005	-0.175**	-0.037	0.007
	(0.29)	(-2.47)	(-0.86)	(0.12)
TASSETS	-0.037***	-0.097*	-0.030**	-0.048***

	(-5.84)	(-2.06)	(-2.42)	(-4.23)
TMTB	0.002***	0.007	0	-0.003**
	(3.55)	(1.35)	(-0.26)	(-2.49)
TROE	-0.018	-0.082	-0.036	-0.112***
	(-0.83)	(-0.92)	(-1.70)	(-4.78)
TGDPCA	0.17	(0.39)	0.03	0.09
	(1.02)	(-0.40)	(0.22)	(0.70)
TGDPGR	-0.006	-0.023	0.008	0.02
	(-0.38)	(-0.38)	-0.26	-1.23
Constant	-0.72	6.688	0.96	-0.782
	(-0.36)	(0.60)	(0.54)	(-0.57)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	464	420	420	420
Adj. R^2	0.298	0.176	0.186	0.253
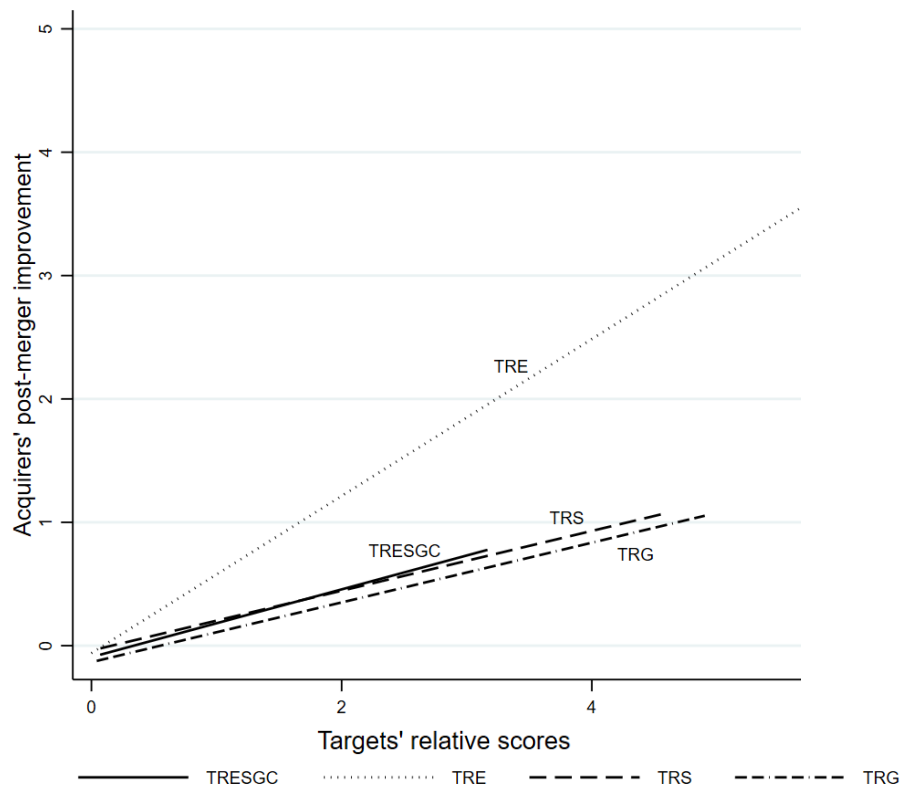
Figure 2.1. The relationship between TRESG and ΔAESG
This figure shows the relationship between targets' relative ESG scores and acquirers' ESG improvement post-merger. The figure also presents the relationship for each aspect of ESG – E, S, and G. The relationships are derived from the regression results reported in Table 2.4.

These findings confirm that acquiring targets with better ESG scores serves as an alternative strategy to enhance acquirers' post-merger ESG ratings. Such a strategy also mitigates the cash-in-hand of acquirers' managers to prevent them from internally overspending on ESG. This is consistent with the organizational learning perspective (Aktas et al., 2011), the resource-based theory (Pfeffer & Salancik, 1978), and the spillover effect (Boone & Uysal, 2020). Acquirers appear to pursue similar or higher reputation targets to extract greater benefit from M&As. It appears that acquiring firms learn from the experience of targets' ESG practice to develop their own ESG policies while maximizing shareholders' value without overspending on ESG (Aktas et al., 2011). When the integration is successful, they inherit well-established stakeholder commitment derived from targets' ESG performance (Henisz et al., 2014) and redeploy ESG-based resources from complementary differences between acquirers and targets (Bauer & Matzler, 2014). Such benefits improve acquirers' post-merger ESG performance and, consequently, their ESG ratings.

The largest magnitude of improvement in acquirers' post-merger sustainability scores is in the environmental category. Firms with poor environmental performance are subject to higher visibility and, therefore, greater external pressure from stakeholders (Bowen, 2000; Marquis et al., 2016). Such pressure also originates from regulatory requirements (Qiu et al., 2020) and media attention (Bryant et al., 2020; Du, 2015). As a result, highly visible issues, such as environmental matters, are perceived as more urgent to resolve (Bowen, 2000). Walker and Wan (2012) contend that such improvements would then be disclosed to the market to verify the legitimacy of firms. Therefore, firms prioritize improvements in environmental practices through M&As rather than social and governance aspects, which are not as visible to the market.

2.4.3. *The impact of targets' relative ESG ratings on M&A deal completion*

Driven by the benefits of acquiring better-ESG targets that improve acquirers' ESG practices post-merger, I further investigate whether the targets' relative ESG ratings pre-merger affect the likelihood of deal completion. I argue that targets with superior ESG performance have lower information asymmetry (Hamrouni et al., 2019), which shortens the negotiation process between acquirers and targets and increases the probability of deal completion (Thompson & Kim, 2020). I include in my sample an additional 133 incomplete deals from 2006 to 2020 in which both the acquirer and target have ESG ratings available one year prior to the deal announcement. I define DCOMPLETE as a dummy variable that equals one for a completed deal, and zero otherwise, and estimate the logit model in Equation (2.4):

$$\boldsymbol{DCOMPLETE_i} = \alpha_0 + \alpha_1 TRESG_{i,t-1} + \alpha_k \sum Controls_{i,t-1} + \gamma + \delta + \vartheta + \varepsilon \qquad (2.4)$$

I find that the targets' relative ESG ratings pre-merger are positively related to the likelihood of deal completion. Columns (1) and (2) of Table 2.5 report the regressions of DCOMPLETE on TRESG and each dimension, respectively. The coefficient of TRESG is positive and significant. A one unit increase in TRESG ratings results in a 1.486 increase in log-odds of deal completion. In other words, the odds ratio increases by 4.39% or the probability that a deal is completed increases by 81%.[9] This result is consistent with Thompson and Kim (2020) who find that acquirers are more likely to successfully

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[9] Odds ratio $= \dfrac{Probability\ of\ deal\ completion}{1-Probability\ of\ deal\ completion}$

complete an M&A deal, and in a shorter period of time, when acquiring targets with lower levels of information asymmetry.

In addition, of the three individual ESG components, the targets' environmental (E) score has the largest impact on the probability of deal completion, as shown by the coefficient on TRE of 1.515. This result is consistent with the finding that acquirers' environmental ratings display the largest increase post-merger . Overall, the exploration of the driving force—the targets' relative ESG ratings on deal completion—enriches the literature on the determinants of deal completion, such as policy and regulation uncertainty (Bonaime et al., 2018), and acquirers' ESG performance (Arouri et al., 2019; Deng et al., 2013).

Table 2.5. The impact of targets' relative ESG performance on deal completion.
This table shows the regressions of the deal completion on targets' relative ESG ratings. Column (1) exhibits the regression of DCOMPLETE on TRESG. Column (2) displays the regression of DCOMPLETE on TRE, TRS, and TRG. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). All regressions are estimated by the logit model. Appendix 2.2 provides definitions of all variables. z-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) DCOMPLETE	(2) DCOMPLETE
TRESG	1.486**	
	(2.22)	
TRE		1.515***
		(3.19)
TRS		1.091*
		(1.88)
TRG		1.454***
		(2.67)
Constant	14.830	-2.356
	(0.43)	(-0.04)
Deal characteristics	Yes	Yes
Acquirers' characteristics	Yes	Yes
Targets' characteristics	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Obs.	519	454
Pseudo R^2	0.666	0.781

2.4.4. Cross-border deals and ESG ratings

I find that the positive relationship between TRESG and ΔAESG is less pronounced for cross-border deals than domestic deals. Table 2.6 reports that the coefficient of CROSSESG is -0.055 and statistically significant (p-value less than 0.1). The results indicate that for a one unit increase in TRESG, the increase in acquirers' post-merger ESG is 0.055 percentage points lower in cross-border deals than in domestic deals. In other words, the positive impact of TRESG on ΔAESG is weaker when targets and acquirers are in different countries. These empirical results provide support for Hypothesis 2.2.

Table 2.6. The variation of the TRESG–ΔAESG relationship across two groups of deals: cross-border and domestic.

This table shows how the impact of targets' relative ESG ratings on acquirers' ESG improvement post-merger across two groups of deals. Column (1) reports the regression of ΔAESG on CROSSESG (i.e., DCROSS*TRESG). Column (2), (3), and (4) display the regressions of ΔAE, ΔAS, and ΔAG on CROSSE (i.e., DCROSS*TRE), CROSSS (i.e., DCROSS*TRS), and CROSSG (i.e., DCROSS*TRG), respectively. Control variables include characteristics of deals (DSIZE, DDIV, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ΔAESG	ΔAE	ΔAS	ΔAG
CROSSESG	-0.055*			
	(-2.00)			
CROSSE		-0.784***		
		(-2.86)		
CROSSS			-0.144**	
			(-2.10)	
CROSSG				0.039
				(0.41)
TRESG	0.279***			
	(9.59)			
TRE		0.808***	-0.022	-0.023**
		(8.10)	(-0.88)	(-2.56)
TRS		-0.228	0.282***	0.064*
		(-1.34)	(3.76)	(1.87)
TRG		0.144*	-0.002	0.238***
		(1.75)	(-0.09)	(16.66)
DCROSS	-0.074**	0.261	-0.013	-0.048
	(-2.18)	(0.93)	(-0.35)	(-0.53)
Constant	-0.784	7.468	0.926	-0.786
	(-0.39)	(0.78)	(0.51)	(-0.56)
Deal characteristics	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	464	420	420	420
Adj. R^2	0.297	0.2	0.192	0.252

This finding is consistent with the value conflict hypothesis proposed by Lee et al. (2015). The cultural differences in cross-border deals lead to employee resistance and

internal conflict. Cross border M&As exhibit lower absorptive capacity, thereby deterring the capacity of transferring knowledge between firms (Björkman et al., 2007). The matter of cultural differences is less severe in domestic deals than in cross-border deals (Krug & Nigh, 2001), strengthening employees' commitment and cooperation (Weber, 1996). The finding is also in line with Osborne et al. (2012), who confirm the obstacles of restructuring and corporate control in cross-border deals. Deng (2010) finds that prior related knowledge helps acquirers identify and understand targets' strategic assets acquired through cross-border deals. Consequently, less related knowledge prior to a deal between parties may make knowledge acquisition in cross-border deals less effective.

Cross-border deals also weaken the TRE–ΔAE and TRS–ΔAS relationships reported in columns (2) and (3) in Table 2.6. The coefficients of CROSSE and CROSSS are -0.784 and -0.144, respectively, and are statistically significant at 1% and 5% levels, respectively. Noticeably, column (2) in Table 2.6 reports that the coefficient of TRE is 0.808. That is, when acquiring cross-border targets with an increase in their relative environmental scores by a one unit, the increase in acquirers' environmental ratings post-merger is 0.784 percentage points lower than acquiring domestic targets. However, acquiring domestic targets with higher relative environmental ratings improves acquirers' post-merger environmental ratings. In addition, cross-border deals do not influence the positive impact of TRG on ΔAG (i.e., the coefficient of CROSSG is positive but statistically insignificant).

2.4.5. *Cross-industry deals and ESG ratings*

I find that the positive relationship between TRESG and ΔAESG is stronger for same industry deals compared to cross-industry ones. As reported in column (1) in Table 2.7, the coefficient of DIVESG is negative (-0.152) with the statistically significant p-value less than 0.01. Along with the TRESG's coefficient of 0.307, my results confirm that the relationship would be weakened if the deals are conducted across industries. For a one unit increase in TRESG, the increase in acquirers' post-merger ESG is 0.152 percentage points higher when acquiring targets in the same industry. Therefore, Hypothesis 2.3 is supported.

Table 2.7. The variation in the TRESG–ΔAESG relationship across two groups of deals: cross-industry and within industry.

This table shows how the impact of targets' relative ESG ratings on acquirers' ESG improvement post-merger across two groups of deals. Column (1) reports the regression of ΔAESG on DIVESG (i.e., DDIV*TRESG). Column (2), (3), and (4) display the regressions of ΔAE, ΔAS, and ΔAG on DIVE (i.e., DDIV*TRE), DIVS (i.e., DDIV*TRS), and DIVG (i.e., DDIV*TRG), respectively. Control variables include characteristics of deals (DSIZE, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ΔAESG	ΔAE	ΔAS	ΔAG
DIVESG	-0.152**			
	(-2.52)			
DIVE		-1.061***		
		(-9.82)		
DIVS			-0.121	
			(-0.96)	
DIVG				-0.018
				(-0.24)
TRESG	0.307***			
	(11.35)			
TRE		0.870***	-0.016	-0.023**
		(9.25)	(-0.65)	(-2.48)
TRS		-0.163	0.269***	0.060*
		(-0.87)	(3.87)	(2.00)
TRG		0.133*	-0.002	0.256***
		(2.00)	(-0.09)	(17.91)
DDIV	0.012	0.748***	0.078	-0.064**
	(0.36)	(6.97)	(1.29)	(-2.41)
Constant	-0.753	3.662	0.862	-0.807
	(-0.39)	(0.37)	(0.50)	(-0.61)
Deal characteristics	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	464	420	420	420
Adj. R^2	0.306	0.231	0.189	0.251

My finding is consistent with Hazelkorn et al. (2004), who report that expected

M&A synergies could be easier to realize when acquiring targets in the same industry. This is attributed to acquirers' ability to understand, assimilate, and transform targets' value into their businesses. This causes the positive effect of TRESG on ΔAESG to be weakened in cross-industry deals.

I further examine how cross-industry deals influence the relationship in each dimension—E, S, and G. Column (2) in Table 2.7 reports that when acquiring targets from different industries, the higher targets' relative environmental scores pre-merger could turn the positive impact of TRE on ΔAE into a negative one. The coefficient of DIVE and TRE are -1.061 (p-value less than 0.01) and 0.870, respectively. Barnea and Rubin (2010) illustrate that environmental issues vary across sectors. Consequently, acquiring targets with better environmental performance in the same industry assists acquirers in improving their respective environmental practice. Targets with good environmental practices, but in a different industry, fail to address the environmental issues that acquirers need to improve. Columns (3) and (4) in Table 2.7 indicate that cross-industry deals have no impact on two relationships: TRS–ΔAS and TRG–ΔAG.

Combing the variation of the TRESG – ΔAESG relationship regarding "*cross-border*" and "*cross-industry*", I additionally investigate which scenario is the optimal strategy for firms to improve their ESG performance through M&As. I perform a regression of ΔAESG on TRESG with the same set of control variables across the following four groups: (1) Cross-border and cross-industry deals, (2) cross-border and same-industry deals, (3) domestic and cross-industry deals, and (4) domestic and same-industry deals. The regression results are presented in columns (1), (2), (3), and (4) in Table 2.8, respectively.

Table 2.8. The variation in the TRESG – ΔAESG relationship across four groups of deals: cross-industry and within industry.

This table shows how the impact of targets' relative ESG ratings on acquirers' ESG improvement post-merger across four groups of deals: cross-border and cross-industry (Column (1)), cross-border and within industry (Column (2)), domestic and cross-industry (Column (3)), and domestic and within industry (Column (4)). Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ΔAESG	ΔAESG	ΔAESG	ΔAESG
TRESG	-0.012	0.328**	0.016	0.303***
	(-0.07)	(2.81)	(0.27)	(8.20)
Constant	6.039	1.994*	-0.712	0.678
	(1.42)	(1.94)	(-0.47)	(0.72)
Cross-border deal	Yes	Yes	No	No
Cross-industry deal	Yes	No	Yes	No
Deal characteristics	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	48	96	80	210
Adj. R^2	-0.048	0.103	0.096	0.253

The coefficients of TRESG vary across the four groups of deals. The group of cross-border and same-industry deals has the largest magnitude of the TRESG's coefficient (0.328) at the 5% significance level. This indicates that, although acquiring targets with higher relative ESG scores cross border would weaken the influence of TRESG on ΔAESG, acquirers can still obtain ESG improvement post-merger if the corresponding targets are from the same industry. This finding is consistent with Li et al. (2016) who contend that, among cross-border deals, acquisitions involving firms in the same industry are less impacted by cultural differences. Such deals allow acquirers to access valuable resources of the foreign targets. The common belief and understanding in the same industry make the acquirers effectively learn and acquire those resources from the targets (i.e., higher learning and absorptive capacity). Table 2.8 suggests that firms should acquire targets from the same industries to yield higher ESG increase post-merger in either cross-border or domestic deals. Figure 2.2 summarizes the relationship between

TRESG and ΔAESG across the four groups of deals.
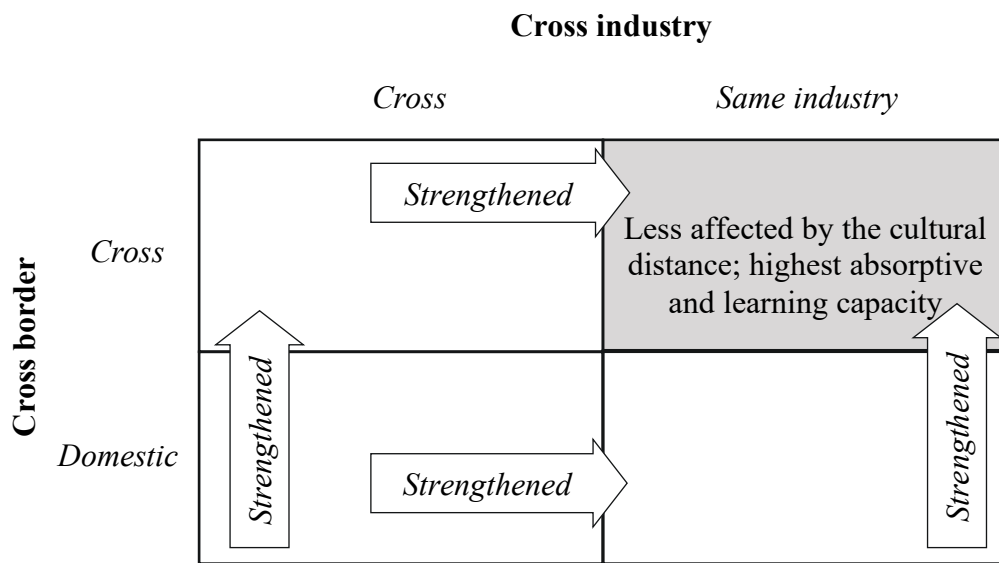
Cross industry

Figure 2.2. The variation in the influence of TRESG on ΔAESG between the cross-border and cross-industry deals.

2.4.6. Acquirers' ESG improvement and shareholder value

The question of whether M&A deals generate increased shareholder value for acquiring companies is still a matter of ongoing debate. One view is that M&A activities increase shareholder value for both mergers (Andrade et al., 2001) and acquisitions (Alexandridis et al., 2013; Cuypers et al., 2017). Conversely, M&A deals have been found to provide no benefits to acquiring firms' shareholders (Jensen & Ruback, 1983) or even lead to decreased shareholder value (Moeller et al., 2005).

I contribute to this literature by investigating if acquiring higher-rated ESG targets has an impact on acquirers' shareholder value. I examine the impact of target firms' relative ESG ratings on the bid premiums of M&A deals and acquirers' financial performance post-merger, respectively. I employ two proxies to estimate the bid premium. The first measure, PREM, is the ratio of the offer price to the target's stock price four weeks prior to the deal announcement. A second measure, PREMVW, is the ratio of the offer price to the 30-day [-45, -15] volume-weighted average of the target's stock price. The target's stock price is lagged in both measures to ensure that it is not affected by takeover rumors around deal announcement dates.

My analysis shows that higher bid premiums are associated with targets that have

higher relative ESG ratings. Columns (1) and (2) of Table 2.9 report the regressions of PREM and PREMVW on TRESG, respectively. The coefficients of TRESG across both regressions are approximately 0.1 and significant. Acquirers offer a bid premium that is 0.1 percentage points higher for an increase of a one unit in relative ESG performance.

Table 2.9. The impact of targets' relative ESG performance on the bid premium of deals.
This table presents the regressions of the bid premium on targets' relative ESG ratings. Column (1) shows the regression of PREM on TRESG. PREM is the ratio of the offer price to the target's price 4 weeks prior to the deal announcement. Column (2) exhibits the regression of PREMVW on TRESG. PREMVW is the ratio of the offer price to 30-day [-45,-15] volume-weighted average of the target's price. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	PREM	PREMVW
TRESG	0.098**	0.100***
	(2.08)	(3.48)
Constant	2.725	-6.116***
	(0.90)	(-2.91)
Deal characteristics	Yes	Yes
Acquirers' characteristics	Yes	Yes
Targets' characteristics	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Obs.	454	454
Adj. R^2	0.215	0.434

Second, following Guest et al. (2010), I use Return-on-Equity as a proxy of the acquirer's profitability post-merger (AROE). AROE is calculated as profit after tax divided by total shareholders' equity. I also follow Healy et al. (1992) and calculate the pre-tax operating cash flow return on assets (AOCFA) to eliminate the impact of the method of financing on profit after tax. AOCFA is defined as the ratio of an acquirer's operating cash flow to its market value of assets.[10]

I find that acquirers' financial performance post-merger increases when acquiring

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[10] Operating cash flow is sales minus cost of goods sold and selling and administrative expenses plus depreciation and goodwill expenses. The market value of assets is the total market value of equity and the book value of net debts.

targets with higher relative ESG ratings. Columns (1) and (2) of Table 2.10 report the regressions of AOCFA and AROE on TRESG, respectively. In column (1), the coefficient of TRESG is positive, 1.562, and significant. The results indicate that for an increase in TRESG by a one unit, the acquirers' post-merger AOCFA increases by 1.562 percentage points. The result is robust when AROE is used as a proxy of financial performance and indicates that M&A deals of higher-rated ESG targets create value for the acquirers' shareholders.

Table 2.10. The impact of target firms' relative ESG performance on acquirers' financial performance one-year post-merger.
This table presents the regressions of acquirers' financial performance one-year post-merger on targets' relative ESG ratings. Column (1) shows the regression of AOCFA on TRESG. AOCFA is the ratio of an acquirer's pre-tax operating cash flow to its total assets at the end of the year after the year of deal announcement. Column (2) exhibits the regression of AROE on TRESG. AROE is calculated as an acquirer's profit after tax divided by total shareholders' equity at the end of the year after the year of deal announcement. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	AOCFA	AROE
TRESG	1.562**	1.803***
	(2.58)	(3.33)
Constant	7.564	-17.372
	(0.10)	(-0.25)
Deal characteristics	Yes	Yes
Acquirers' characteristics	Yes	Yes
Targets' characteristics	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Obs.	464	464
Adj. R^2	0.094	0.089

The finding also extends to the study of Krishnamurti et al. (2021), which reveals that firms that trade-off between investments in sustainability and M&As pay lower bid premiums to create more value for their shareholders. My study suggests that acquirers that offer higher bid premiums to targets with better ESG performance enhance both their shareholders' value and improve their sustainability performance post-merger.

2.4.7. Potential greenwashing post-merger

Greenwashing is an emerging concern related to firms' ESG practices. Greenwashing is a practice of providing stakeholders with misleading information regarding a firm's environmental performance to portray itself as an environmentally friendly organization (Delmas & Burbano, 2011). While the extent of greenwashing might not be captured in a combined ESG score, it is less likely to manifest itself in measures that are prone to greater public scrutiny. To investigate this possibility, I select three measures of an acquirer's Refinitiv ESG rating that capture the level of commitment to improved ESG practices. I examine acquirers' total carbon emissions, the number of product recalls, and the number of employee accidents. Total carbon emission, the first variable, is the total carbon dioxide (CO_2) and CO_2-equivalents in metric tons. I calculate ΔACO2 as the change in total carbon emissions from one year prior to one year after the year of deal announcement, scaled by acquirer's total assets. ΔAACCIDENT, the second variable, equals the change in the number of injuries and fatalities reported for an acquirer from one year prior to one year after the deal announcement. ARECALL, the third variable, is a dummy variable that assumes the value of 1 in the event of a mass recall of products or the complete withdrawal of a product due to safety reasons one-year post-merger, and 0 otherwise. I perform OLS regressions to examine the relationship between each of the two dependent variables ΔACO2 and ΔAACCIDENT on TRESG, and the logit model to explore the association between ARECALL and TRESG.

The results in Table 2.11 demonstrate significant improvement in specific ESG practices following the merger. Column (1) indicates that the coefficient of ΔACO2 equals -0.547 and is significant at the 1% level. For a one standard-deviation increase in TRESG, acquirers' post-merger CO_2 emissions decrease by 0.547 percentage points. The figures in Column (2) reveal that the number of employee accidents decrease by 0.11 percentage points for an increase in TRESG by a one unit. Finally, the coefficients in Column (3) indicate that acquiring higher-rated ESG targets decreases the likelihood of product recall. A one unit increase in TRESG is associated with a decrease of 1.825 in the log-odds of a product recall. In other words, the odds ratio decreases by 6.2% or, alternatively, the probability of a product recall decreases by 86%.[11] Overall, these

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[11] Odds ratio $= \frac{Probability\ of\ product\ recall}{1-Probability\ of\ product\ recall}$.

findings confirm a statisically significant improvement in three prominent and public measures of an acquirer's ESG practices post-merger. My results suggest that acquirers are not engaging in greenwashing but instead are demonstrating a meaningful commitment to improving their own sustainability practices.

Table 2.11. The impact of targets' relative ESG performance on acquirers' ESG practices one-year post-merger.
This table presents the regressions of acquirers' ESG practices one-year post-merger on targets' relative ESG ratings. Column (1) shows the regression of $\Delta ACO2$ on TRESG. $\Delta ACO2$ is the change in total carbon emissions, scaled by an acquirer's total assets, from one year before to one year after the year of deal announcement. Column (2) exhibits the regression of $\Delta AACCIDENT$ on TRESG. $\Delta AACCIDENT$ is the change in the number of injuries and fatalities reported by employees while working for an acquirer from one year before to one year after the year of deal announcement. Column (3) reports the regression of ARECALL on TRESG. ARECALL records 1 for an occurrence of product recall one-year post-merger and 0 otherwise. The first two regressions are estimated by the OLS estimate while the latter is estimated by the logit model. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t- and z-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)
	$\Delta ACO2$	$\Delta AACCIDENT$	ARECALL
TRESG	-0.547***	-0.110**	-1.825**
	(-5.67)	(-2.92)	(-2.28)
Constant	-6.658	2.719	-41.979
	(-0.90)	(0.91)	(-1.6)
Deal characteristics	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Obs.	434	330	411
Adj. R^2	0.183	0.164	
Pseudo R^2			0.283

2.5. Robustness tests

2.5.1. The alternative measure of the acquirers' post-merger ESG change

I predict that it may take time to realize acquirers' post-merger changes in ESG ratings and each ESG dimension. I additionally measure acquirers' ESG improvement

two years (ΔAESG2) after the deal announcement in addition to the one year in my main analysis. Table 2.12 reports that the target firms' relative ESG scores and the score across each dimension remain positive and have a significant impact on the acquirers' corresponding change. The magnitude of these coefficients is relatively higher than that discussed in subsection 4.2, thereby supporting my prediction that acquirers' improvement in sustainability ratings take time to be realized.

Table 2.12. The impact of target firms' relative ESG performance on acquirers' ESG improvement two years post-merger.
This table presents the regressions of acquirers' ESG improvement two years post-merger on targets' relative ESG ratings. Column (1) shows the regression of ΔAESG2 on TRESG. Column (2), (3), and (4) display the regressions of ΔAE2, ΔAS2, and ΔAG2 on TRE, TRS, and TRG, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) ΔAESG2	(2) ΔAE2	(3) ΔAS2	(4) ΔAG2
TRESG	0.361***			
	(5.90)			
TRE		1.041***	0.002	-0.002
		(6.71)	(0.06)	(-0.16)
TRS		-0.18	0.286***	0.045
		(-0.73)	(4.10)	(1.46)
TRG		0.204*	0.041	0.332***
		(1.76)	(1.38)	(11.46)
Constant	1.494	6.597	4.504	1.164
	(0.45)	(0.48)	(1.35)	(0.51)
Deal characteristics	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	432	391	391	391
Adj. R^2	0.33	0.212	0.234	0.254

2.5.2. Targets with relatively lower ESG ratings

My baseline results reported in section 4.2 reveal a significant positive relationship between a target firm's ESG rating (TRESG) relative to the acquirer and the

acquirer's ESG scores post-merger. However, Table 2.3 shows that the mean value of TRESG is 0.84, thereby suggesting that the majority of target firms have a lower ESG rating than their acquirer. To address the concern that my baseline result is driven by M&A deals in which TRESG is greater than one, I filter my sample and retain only those firms that have a value of TRESG that is less than one. I estimate Equation (2.1) using the smaller sample of 113 deals and report the results in Table 2.13. The highly significant coefficient of TRESG in Column (1) is 0.225 and compares favorably with the figure of 0.271 reported in Table 2.4 for the full sample, thereby suggesting that a higher ESG rating is not confined to the acquisition of targets with higher ESG rating. Similarly, the coefficient estimates in columns (2), (3), and (4) are quantitively similar to the corresponding figures reported in Table 2.4. This analysis reveals that my baseline results are robust and that acquirers experience ESG increases even when acquiring target firms with a relatively lower ESG rating.

Table 2.13. The impact of target firms' relative ESG performance on acquirers' ESG improvement one-year post-merger with the sample of TRESG equal to or larger than one. This table presents the regressions of acquirers' ESG improvement one-year post-merger on targets' relative ESG ratings with the sample of TRESG equal to or larger than one. Column (1) shows the regression of ΔAESG on TRESG. Column (2), (3), and (4) display the regressions of ΔAE, ΔAS, and ΔAG on TRE, TRS, and TRG, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) ΔAESG	(2) ΔAE	(3) ΔAS	(4) ΔAG
TRESG	0.255***			
	(5.56)			
TRE		0.959***	-0.018	-0.037*
		(4.30)	(-0.22)	(-2.11)
TRS		-0.659	0.250**	0.086
		(-1.47)	(2.35)	(1.27)
TRG		-0.036	-0.076	0.263***
		(-0.11)	(-1.22)	(4.56)
Constant	0.774	-19.534	3.431	-3.857
	(0.14)	(-0.43)	(0.40)	(-1.57)
Deal characteristics	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Obs.	113	95	110	130
Adj. R^2	0.372	0.326	0.162	0.111

2.5.3. The Two-Stage Least Squares (2SLS) estimate

I also estimate Equation (2.1) using 2SLS as a robustness test. This estimate uses the level of individualism (INDIVIDUAL) of a target firm's country as an instrumental variable. The level of individualism is the extent to which individuals are integrated into groups (Hofstede, 1997, 2001). Firms located in a country with a higher level of individualism are more likely to practice explicit CSR to respond to stakeholders' expectations. Ioannou and Serafeim (2012) find that firms have better corporate social performance when they are located in countries characterized by higher levels of individualism. Consequently, I argue that the level of individualism of a country where a

firm is located positively impacts its ESG ratings that is, INDIVIDUAL theoretically satisfies the relevance condition of a good instrumental variable. I empirically confirm the relevance condition of INDIVIDUAL by assessing the first-stage regressions reported in columns (1), (3), (5), and (7) in Table 2.14. The coefficients associated with INDIVIDUAL in four regressions are all positive and statistically significant (p-values less than 1%), and are consistent with those obtained in Ioannou and Serafeim (2012). The F-statistics in the four regressions are higher than 10 and this indicates that the relevance condition is statistically satisfied (Staiger & Stock, 1997). There is no reason to believe that the level of individualism of a target firm's country has a direct impact on an acquirer's ESG rating rather than an indirect effect via the targets' ESG ratings. Hence, the exclusion restriction is met. I account for only one instrumental variable for one endogenous variable in each regression, so my models are just-identified.

Table 2.14 reports that acquirers could improve their post-merger ESG scores and each dimensional score by acquiring targets with higher relative combined ESG, E, S, and G scores, respectively. The coefficients of TRESG, TRE, TRS, and TRG are 0.337, 1.02, 0.185, and 0.306, respectively, and all of them are statistically significant. These statistical results strongly confirm my base finding.

Table 2.14. The impact of target firms' relative ESG performance on acquirers' ESG improvement one-year post-merger with the 2SLS estimate.
This table presents the regressions of acquirers' ESG improvement one-year post-merger on targets' relative ESG ratings. Column (1), (3), (5) and (7) are the first stage in the 2SLS regressions of ΔAESG, ΔAE, ΔAS, and ΔAG on TRESG, TRE, TRS, and TRG, respectively. Column (2), (4), (6), (8) report the second stage of those corresponding regressions. A country's score of Individualism (INDIVIDUAL) is an instrumental variable. Ranging from 0 (lowest) to 100 (highest), the individualism scores are obtained from Hofstede Insight Database. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TRESG	ΔAESG	TRE	ΔAE	TRS	ΔAS	TRG	ΔAG
TRESG		0.337***						
		(5.85)						
TRE				1.020***				
				(4.21)				
TRS						0.185***		
						(3.69)		
TRG								0.306*
								(1.87)
INDIVIDUAL	0.05***		0.076***		0.053**		0.04**	
	(10.08)		(3.92)		(7.36)		(5.19)	
Constant	4.366	-0.390	-0.199	7.274	3.847	1.411	3.612	-0.703
	(1.53)	(-0.23)	(-0.02)	(0.77)	(0.78)	(0.84)	(0.69)	(-0.40)
Deal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	489	489	443	443	489	489	489	489
F statistics	78.08		43.56		82.69		58.27	
Adj. R^2	0.453	0.273	0.142	0.079	0.268	0.174	0.172	0.169

2.5.4. *Potential of selection bias and Heckman two-stage estimation*

The issue of selection bias may exist in the studied sample as the decision to acquire targets is not random. Such a sample-induced endogeneity affects OLS-estimated coefficients (Certo et al., 2016). Following Heckman (1979) and Austin et al. (2020), I employ the Heckman Two-Stage estimation to identify and mitigate the selection bias. The first stage examines whether the observations from the population appear in the

studied sample, so I employ both complete and incomplete deals in the first stage. That is, I use DCOMPLETE as the dependent variable and emplot the same set of independent and control variables studied in Equation (2.1). DCOMPLETE is a dummy variable that equals one for a completed deal, and zero otherwise. The second stage regression estimates the TRESG - ΔAESG relationship by using OLS incorporating the Inverse Mills Ratio (IMR) correction variable estimated from the first stage regression.

Table 2.15 presents the regression results of the Heckman Two-Stage estimation. Columns (1) and (2) report the first and second stage regressions, respectively. The coefficient of the Inverse Mills Ratio (IMR) is insignificant (p-value > 0.1), confirming that selection bias does not exist in this study. The coefficient of TRESG in the second stage is 0.272 and statistically significant (p-value < 0.05). This result remains consistent with my finding reported in Section 2.4.2.

Table 2.15. The impact of target firms' relative ESG performance on acquirers' ESG improvement by using the Heckman Two-Stage Estimation

This table reports the Heckman Two-Stage estimation of the impact of target firms' relative ESG performance on acquirers' ESG improvement one-year post-merger. Column (1) shows the probit regression of DCOMPLETE on TRESG. Column (2) presents the OLS regression of ΔAESG on TRESG and the Inverse Mills Ratio (IMR) generated from the first stage regression. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), of acquirers (AMKCAP, ALEV, AASSETS, AMTB, AEXP), and of targets (TASSETS, TMTB, TROE, TGDPCA, TGDPGR). Appendix 2.2 provides definitions of all variables. z- and t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) DCOMPLETE	(2) ΔAESG
TRESG	0.747*	0.272***
	(1.8)	(5.77)
IMR		-0.014
		(-0.20)
Constant	11.017	-0.877
	(0.8)	(-0.36)
Deal characteristics	Yes	Yes
Acquirers' characteristics	Yes	Yes
Targets' characteristics	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Obs.	519	392
Pseudo R^2	0.665	
Adj. R^2		0.285

2.6.   Conclusion

Firms motivated by a stakeholder-focus seek to improve their ESG practice. My study has several practical implications. I find that acquiring a target firm with a relatively higher ESG score can be considered an alternative to the often-inefficient practice of improving ESG metrics internally. In addition, improving ESG through M&As prevents the managers of acquiring firms from ESG self-overinvestment, an issue supported by the shareholder-focused theory. In addition, I suggest that acquiring firms can maximize this benefit by acquiring targets from different countries but in the same industry. These implications are based on my findings, which remain consistent when using both estimate methods, the OLS and 2SLS.

There remains room for further research in this regard. Although acquiring a firm with a higher ESG score could improve an acquirer's ESG rating post-merger, it will be interesting to examine the impact of ESG similarity and complementarity between acquiring and target firms. Bauer and Matzler (2014) show that strategic similarity and complementarity have an impact on the integration speed and success of M&As. This may influence acquirers' ESG-related learning from target firms and ultimately impact the efficiency of ESG practice transfer to acquirers.

Appendix 2.1. Sample distribution by announcement year

This appendix describes the number of M&A deals across years. The second column reports the number of deals. The third column shows the number of cross-border deals, in which acquirers' and targets' nations are different. The forth column displays the number of cross-industry deals, in which acquirers' and targets' industries are different.

Year	# Deals	# Cross-border deals	# Cross-industry deals
2006	5	4	1
2007	7	4	1
2008	15	3	6
2009	16	5	6
2010	21	10	8
2011	29	10	5
2012	27	10	11
2013	16	4	7
2014	39	12	12
2015	47	16	14
2016	52	22	20
2017	51	19	21
2018	67	22	21
2019	64	22	15
2020	33	9	10
Total	489	172	158

Appendix 2.2. Variable measures

This appendix describes the abbreviations and measures of all variables in the study.

Variable	Abbreviation	Measure
Target's relative ESG ratings	TRESG	The ratio of a target's ESG Combined Score to that of an acquirer. TRE, TRS, and TRG are the target's relative ratings in ESG dimensions, respectively.
Deal completion	DCOMPLETE	1 if the deal is completed and 0 otherwise
Bid premium	PREM	The ratio of the offer price to the target's price 4 weeks prior to the deal announcement
Bid premium	PREMVW	The ratio of the offer price to 30-day [-45,-15] volume-weighted average of the target's price
Acquirer's operating cash flow to total assets	AOCFA	The ratio between an acquirer's operating cash flow and its market value of assets. Operating cash flow is as sales minus cost of goods sold and selling and administrative expenses, plus depreciation and goodwill expenses. The market value of assets is the total market value of equity and book value of net debts.
Acquirer's return on equity	AROE	The profit after tax divided by total shareholders' equity
Acquirer's change in CO_2 emission post-merger	$\Delta ACO2$	The change in total carbon emissions, scaled by an acquirer's total assets, from one year before to one year after the year of deal announcement
Acquirer's change in the number of reported employee accidents post-merger	$\Delta AACCIDENT$	The change in the number of injuries and fatalities reported by employees while working for an acquirer from one year before to one year after the year of deal announcement
Acquirer's product recall	ARECALL	1 if there is an occurrence of product recall one-year post-merger and 0 otherwise
Deal size	DSIZE	Natural logarithm of total deal value in U.S. dollars
Deal diversification	DDIV	1 if the 2-digit-SIC industries of the target and the acquirer are different, 0 otherwise
Cross-border deal	DCROSS	1 if the nations of the target and the acquirer are different, 0 otherwise
Multiple bidder deal	DMUL	1 if the deal involves more than one bidder, 0 otherwise
Cash-offer deal	DCASH	1 if the deal is offered by 100% cash, 0 otherwise
Stock-offer deal	DSTOCK	1 if the deal is offered by 100% stocks, 0 otherwise
Acquirer's market capitalization	AMKCAP	Natural logarithm of an acquirer's total market capitalization at the end of the year prior to the deal announcement
Acquirer's total assets	AASSETS	Natural logarithm of an acquirer's total assets at the end of the year prior to the deal announcement
Acquirer's market-to-book value	AMTB	A target's market-to-book value of equity at the end of the year prior to the deal announcement
Acquirer's leverage	ALEV	An acquirer's total debts-to-total assets ratio at the end of the year prior to the deal announcement
Acquirer's experience	AEXP	1 if the acquirer involves other M&A deals prior to the focal one, 0 otherwise
Target's total	TASSETS	Natural logarithm of a target's total assets at the end of

assets		the year prior to the deal announcement
Target's market-to-book value	TMTB	A target's market-to-book value of equity at the end of year prior to the deal announcement
Target's return-on-equity	TROE	A target's net income divided by its total stockholders' equity at the end of the year prior to the deal announcement
Target's GDP per capita	TGDPCA	A target's total value created by all domestic producers in the economy divided by its country's population
Target's GDP growth rate	TGDPGR	A percentage change in a target's total value created by all domestic producers in the economy from a previous year to a current year.

Chapter 3

Trust Me, I'm Going Green:

Greenwashing Through Mergers and Acquisitions

3.1. Introduction

ESG practices bring firms several benefits, but firms are also exposed to pressure on ESG commitment, which probably induces them to engage in ESG greenwashing activities. Good ESG performance helps firms improve reputation (Boone & Uysal, 2020), lower cost of capital (Fatemi et al., 2015), and strengthen stakeholder commitment (Arouri et al., 2019; Deng et al., 2013). Firms that perform poorly in terms of ESG measures or operate in ESG-sensitive industries are particularly exposed to ESG-related pressure from external stakeholders due to their higher visibility (Bowen, 2000; Marquis et al., 2016). However, those firms may engage in ESG greenwashing to meet the external stakeholders' demand (Delmas & Burbano, 2011; Garrow & Valentine, 2012; Walker & Wan, 2012). Greenwashing is broadly defined as providing stakeholders with misleading information regarding a firm's environmental performance in order to portray itself as an environmentally friendly organization (Delmas & Burbano, 2011).

One approach to respond to stakeholder pressure to address poor ESG practices is to acquire a firm with higher ESG metrics (Li, Xu, et al., 2020). Acquirers could engage in M&As with "green" target firms to adopt their green practices, thereby leading to improved ESG performance (Pfeffer & Salancik, 1978). Such M&A deals help the acquiring firm enhance its sustainability while simultaneously satisfying stakeholders' ESG demands. However, whether acquirers genuinely transform their ESG performance or simply execute M&A deals as a means of greenwashing to comply with external stakeholder demands is an empirical question. There may also be another motivation to acquire a firm with a higher ESG score. This strategy may be used by acquirers who engage in greenwashing to maintain the illusion that the acquirer is "green". Such

acquirers do not intend to or do not have the learning and absorptive capacity to integrate their targets' ESG practices. The purpose of such deals is to send a misleading signal of corporate green transformation to the market (Bryant et al., 2020; Li, Xu, et al., 2020).

One example of the strategy to use M&A to transform a business is illustrated in the acquisition of Burt's Bees by The Clorox Company (Clorox) in 2007 (Story, 2008). With increased pressure from customers for green products, bleach manufacturer Clorox paid close to $1 billion to acquire Burt's Bees, a green manufacturer of beeswax-related products. Clorox claimed that it was expecting to learn the environmental practices of Burt's Bees in an effort to make its own products eco-friendlier. However, Clorox's history of greenwashing prior to the deal caused skepticism partially on account of its vague reporting on its environmental programs (Conley, 2012; Story, 2008). However, following the merger, Clorox introduced a new range of cleaning products known as Green Works, made from 99% natural ingredients. The controversies score for Clorox provided by Refinitiv increased from 50 (pre-merger) to 100 (post-merger).

In addition to media attention as in case of Clorox and Burt's Bees, greenwashing has attracted a substantial body of academic research. Most greenwashing studies focus on environmental aspects (Du, 2015; Marquis et al., 2016; Testa et al., 2018; Walker & Wan, 2012), while Lyon and Maxwell (2011) and Yu et al. (2020) expand the definition of greenwashing to include social and governance factors. An expanded definition is essential, as all three components—E, S, and G—simultaneously drive the sustainability of a business. For example, in 2006, L'Oréal of France, a firm associated with animal testing of its cosmetics products for numerous years, acquired Body Shop International, which is committed to no animal-testing of its products.[12] In 2021, tobacco manufacturer Phillip Morris International Inc acquired Vectura Group plc, a British health care company.[13] These controversial deals highlight the emergence of social components in a broader greenwashing scope. Therefore, I examine all three aspects of ESG to examine potential greenwashing issues in M&As.

My measure of greenwashing is motivated by Seele and Gatti (2017). They

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[12] For more details, see https://www.nytimes.com/2006/03/17/business/worldbusiness/loral-buys-body-shop.html
[13] For more details, see https://www.bloomberg.com/press-releases/2021-07-09/philip-morris-international-inc-announces-firm-offer-to-acquire-vectura-group-plc-acquisition-accelerates-pmi-s-beyond

suggest that greenwashing occurs when an external party, such as the media, accuses a company of acting in a manner that contradicts the information it publicly communicates to their external stakeholders. Identifying and measuring greenwashing is possible through the controversy that arises from an allegation of ESG-wrongdoing. This greenwashing measure is only possible when a firm has been accused of a conflict between its claimed ESG practices and its actual ESG actions. Thus, the greenwashing definition proposed by Seele and Gatti (2017) motivates me to employ a new proxy for greenwashing that incorporates external accusations of misleading claims.

I employ the ESG controversies score from the Refinitiv ESG Database as a new greenwashing proxy. The ESG controversies score captures a firm's ESG scandals against its publicly disclosed ESG commitments. A higher ESG controversies score indicates greater consistency between a firm's activities and what it communicates to the public. Firms accused of practices that violate its stated principles are associated with lower ESG controversies scores.

In this chapter, I investigate how M&A deals can be used to improve ESG practices or be used for further greenwashing. First, I examine whether acquirers who engage in greenwashing acquire targets with better relative ESG performance (i.e., proxied by ESG Combined (ESGC) scores). Second, I investigate how the market reacts to such deal announcements. Third, I study the relationship between the pre-merger relative ESG performance of targets and acquirers' level of greenwashing post-merger. Examining both the short-term market reaction and the extent of greenwashing post-merger help me answer the question of whether greenwashing acquirers legitimately transform their ESG practices or simply engage in greenwashing through M&A deals.

Although the market perceives such deals as greenwashing around deal announcement dates, I find evidence of legitimate green transformation of greenwashing acquirers one year after deal announcements. I find that acquirers with a one standard deviation higher level of greenwashing pre-merger acquire targets with 1.227 percentage points higher relative ESGC scores in a significant manner (p-value less than 0.01). Subsequently, acquirers' cumulative abnormal returns are 0.108 and 0.071 percentage points lower in the three-day and five-day windows around the deal announcement dates when their level of greenwashing pre-merger is one standard deviation higher. This result indicates that the market reacts negatively to such deal announcements, and the negative

response is more pronounced when the target firm has a higher ESG controversies rating. However, this initial skepticism is alleviated one year after the deal announcement, as I find that acquiring targets with one standard deviation higher relative ESGC scores lowers acquirers' level of greenwashing by 0.346 percentage points post-merger.

I make several important contributions to the literature. First, I find that acquirers with a higher level of greenwashing pre-merger tend to acquire targets with higher relative ESGC scores. I also provide evidence that such deals reduce acquirers' level of greenwashing post-merger, thereby confirming their green transformation. My findings are consistent with both the resource dependence theory and the organizational learning theory (Pfeffer & Salancik, 1978). The theories support the view that acquirers could acquire and learn the ESG practices of their targets. Successfully integrating ESG practices could improve acquirers' ESG performance and reduce their engagement in post-merger greenwashing activities. A decrease in the level of greenwashing by an acquirer post-merger enriches the benefits of green deals studied in previous literature. Li, Xu, et al. (2020) show that acquiring a highly sustainable target helps an acquirer improve its legitimacy, which is measured by greater access to resources, lower financial constraints, and reduced tax liability. Green deals also boost acquirers' business model innovation and sustainability (Li, Liu, et al., 2020).

Second, I shed light on how the market perceives deals that involve greenwashing acquirers and high ESG-rated targets. My finding of a negative market reaction is consistent with the attribution theory (Parguel et al., 2011). Seele and Gatti (2017) contend that there is information asymmetry between acquirers and the market. Lacking information regarding the intention of acquirers, the market consequently refers to acquirers' past greenwashing behavior and reacts negatively to the deal announcement. My finding is also consistent with Du (2015), who finds that a firm's cumulative abnormal return is lower around the date when the market accuses a firm of greenwashing and publishes evidence of its greenwashing activities. In addition, the market's negative perception of such deals is more pronounced when the target firms' ESGC scores are higher. Previous studies find that the ESG ratings of acquirers and target firms have a positive impact on deal performance, including deal announcement returns, long-term buy-and-hold abnormal returns (Deng et al., 2013), and accounting-based returns (Tampakoudis & Anagnostopoulou, 2020). In contrast to these studies, I find that the

target firms' relative ESGC ratings negatively influence the acquirers' deal announcement returns when accounting for the acquirers' greenwashing level pre-merger.

3.2. Related literature

3.2.1. Definition and costs of greenwashing

Firms that adopt sound ESG practices and engage in environmentally transformative initiatives convey a signal of their legitimate sustainability concerns to stakeholders (Torelli et al., 2019). Weber (1968) and Suchman (1995) refer to this legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions". Obtaining legitimacy benefits the firm through access to greater resources, attaining stronger stakeholder commitment, and attracting more competitive job applicants (Walker & Wan, 2012). These advantages lead to improved firm performance (Deephouse, 1999) and ultimately firm value. Therefore, firms have a financial incentive to promote their positive ESG practices, even if the actions are not legitimate.

Due to its multifaceted nature, there is no single definition of greenwashing in the literature. One definition relates greenwashing to selective disclosure. Delmas and Burbano (2011) and Marquis et al. (2016) define greenwashing as misleading customers regarding a firm's poor environmental performance via positive communication. Abrahamson and Park (1994) illustrate how managers conceal a firm's negative outcomes to avoid damaging their reputation and adjusting their incentive contracts. Securing their positions under the threat of a takeover also motivates them to selectively disclose negative performance.

Walker and Wan (2012) and Siano et al. (2017) consider it greenwashing when a firm engages in "green talk". This language is merely a symbolic action designed to satisfy stakeholders' demands to address sustainability issues. In other words, firms fail to fulfil their commitments on environmental concerns in order to alleviate external public pressure on sustainability (Gou et al., 2018). Seele and Gatti (2017) argue that greenwashing should combine two elements: falsity and accusation of misleading information (i.e., external distortion). If the market does not accuse a firm's symbolic

actions, then the firm is classified as potentially greenwashing. Following the approach of Seele and Gatti (2017), we define greenwashing as a firm's misleading behavior which is accused and reported by the market.

Further, greenwashing bears certain costs. Seele and Gatti (2017) argue that when stakeholders accuse a firm of misleading behavior, it reduces the reliability of the ESG signal. Then, the firm's legitimacy is negatively affected (Berrone et al., 2013). Walker and Wan (2012) show that symbolic actions ("green talk") negatively impacts a firm's financial performance while substantive actions ("green walk") have no influence. Du (2015) finds evidence that when firms are accused of greenwashing, their cumulative abnormal return around the date of accusation are smaller. Overall, misleading communication regarding ESG performance has the potential to help a firm obtain legitimacy; however, the accusation of misleading activities reduces its legitimacy and, consequently, affects financial performance.

3.2.2. *Benefits of green deals for acquiring firms*

Li, Xu, et al. (2020) refer to "green M&As" as an acquisition of a green target, which has energy-saving or emission-reduction technologies, by an acquiring firm that is a heavy polluter. The purpose of such an M&A is green transformation by obtaining access to the target's green resources and improving green practice (Lu, 2021).

Previous literature reveals that obtaining legitimacy is the primary benefit created by a green deal. This legitimacy includes three categories: regulatory, normative, and cognitive (Delmas & Burbano, 2011). Regulatory legitimacy (i.e., or institutional legitimacy) focuses on a firm's compliance with laws and rules. Normative and cognitive legitimacy requires a firm to satisfy social and ethical benchmarks and social expectations (Li, Xu, et al., 2020). In other words, firms could obtain ESG-related legitimacy as they meet ESG demands from regulators (Suchman, 1995; Weber, 1968). Nguyen et al. (2022) find that firms can improve their ESG practice by acquiring targets with higher ESGC ratings. The resource dependence and organizational learning theories support this finding. Acquirers could acquire green practice and green resources from green targets (Pfeffer & Salancik, 1978), so the acquiring firms could obtain legitimacy through green deals (Li, Xu, et al., 2020). Improving legitimacy is an aspect that enhances firm value, thereby enabling firms to lower the costs of acquiring resources, reduce financial

constraints, and enhance risk-taking capacity (Gupta, 2018).

3.2.3. Potential of greenwashing through green M&As

There are two views on the acquisition of a high ESG-rated target by a greenwashing acquirer. On the one hand, the acquirer may not actually adopt the target's ESG practice, but instead uses the M&A deal to mislead the market with regard to its intentions. Such misleading green claims send a signal to the market of complying with stakeholders' ESG demands. On the other hand, a greenwashing acquirer could legitimately transform its business to be more sustainable via the M&A. It could acquire and learn the target's ESG practice according to the resource dependence and organizational learning theories (Pfeffer & Salancik, 1978).

Both views suggest that acquirers with higher levels of greenwashing pre-merger acquire targets with higher relative ESGC ratings. Such an acquisition helps the acquirer to either strengthen a misleading green signal sent to the market or legitimately acquire more green resources from the target. Therefore, I propose the following hypothesis:

Hypothesis 3.1: Acquirers' levels of greenwashing pre-merger is positively related to target firms' relative ESG performance pre-merger.

3.2.4. The market's response to green M&A deals

Previous literature finds that greenwashing firms experience lower financial performance and a negative market reaction to M&As. Walker and Wan (2012) show that greenwashing firms have negative financial outcomes proxied by return on assets. Greenwashing activities bear associated costs, such as higher perceived risks and environmental penalties and fines (Bansal & Clelland, 2004). In addition to accounting-based performance, greenwashing also negatively impacts market-based measures of financial performance (e.g., TobinQ, Market-to-Book value) (Testa et al., 2018). Furthermore, misleading communication regarding environmental performance negatively impacts a firm's intangible asset value (Konar & Cohen, 2001). Greenwashing firms exhibit lower cumulative abnormal return (CAR) around greenwashing actions (Du, 2015). Such negative reactions in the market are more pronounced when the levels of reputation and legitimacy attained from misleading communication are higher (Torelli et al., 2019).

In contrast, green M&A deals achieve a favorable response from the market. Aktas et al. (2011) find that acquiring targets with better sustainability performance rewards acquirers with higher cumulative abnormal return around the deal announcement date. Such an acquisition signals to the market that acquirers are willing to learn from their targets' practices and experiences related to sustainability. This learning process could add value to acquirers. Further, Tampakoudis and Anagnostopoulou (2020) show that acquirers obtain a higher Tobin's Q—which investors perceive as greater growth potential and investment efficiency—after acquiring a target with a higher ESG rating.

However, external stakeholders may fail to distinguish misleading green claims by a firm. Seele and Gatti (2017) find that the existence of information asymmetry between a firm and its external stakeholders makes the greenwashing strategy successful. Due to information asymmetry, investors lack relevant information to infer the legitimacy of green acquisition by a greenwashing firm. However, when a firm is accused of greenwashing by the market prior to an M&A deal, investors may infer that the firm's current green acquisition is evidence of further greenwashing. Consequently, the market may negatively respond to such deal announcements. Therefore, I propose the following hypothesis:

Hypothesis 3.2: Acquirers' levels of greenwashing pre-merger are negatively related to their cumulative abnormal returns (CAR) around M&A deal announcement dates.

3.2.5. *The post-merger practice of greenwashing acquirers*

Following the resource dependence theory (Pfeffer and Salancik, 1978) and the organizational learning hypothesis (Aktas et al., 2011), an acquirer could decrease their level of greenwashing post-merger when acquiring targets with higher relative ESG ratings. By acquiring, learning, and integrating targets' ESG practices, acquirers not only improve their sustainability practices but also reduce their greenwashing activities. Therefore, I propose that:

Hypothesis 3.3: Target firms' relative ESG performance pre-merger are negatively related to the change in acquirers' pre- and post-merger levels of greenwashing.

3.3. Methods

3.3.1. Sample description

I obtain data on all international deals from Thomson Securities Data Company (SDC) Platinum Mergers and Acquisitions Database and apply the following criteria, which are in line with previous studies (Aktas et al., 2011; Alexandridis et al., 2013). The completed deals are announced between January 1, 2006 and December 31, 2020. Both acquirers and targets are listed non-financial companies—that is, I exclude firms with Standard Industrial Classification (SIC) codes from 6000 to 6999. All deal values are reported to be at least US$1 million. I exclude spin-offs, recapitalizations, self-tenders, repurchases, minority stake purchases, acquisitions of remaining interest, exchange offers, and privatizations. The acquirers must own less than 50% of the target firm's shares before the deal announcement and at least 50% after completing the deal. These criteria lead to an initial sample of 3,863 observations. Then, I obtain the accounting- and market-based data for each deal in the initial sample. The final sample includes 489 deals with all required data available. Appendix 3.1 presents the sample description.

3.3.2. Variable measures

3.3.2.1.   ESG combined Scores

I measure the sustainability (ESG) performance of a firm by using the ESG combined score (ESGC) provided by Refinitiv ESG Database. ESGC data is available for over 11,000 global firms since 2002. The ESGC score is based on an assessment of over 500 ESG measures that are grouped into 10 categories and 3 pillars (i.e., ESG). Refinitiv adopts the percentile rank scoring method to make the scores relative within a respective industry. Those scores are also benchmarked against The Refinitiv Business Classifications to make them comparable across industries. The ESG score measures a firm's ESG performance, commitment, and effectiveness based on the company's self-reported data. The ESG score is then discounted by the controversies score, which captures the frequency and severity of the firm's negative media coverage relating to ESG issues. It aims to provide a comprehensive ESG performance score of a firm and is so-called ESG Combined Score. Particularly, if the ESG score is higher than the controversies score, the ESGC is the average of those two scores. Otherwise, the ESGC

is equal the ESG score. The ESGC ranges from 0 (the worst) to 100 (the best). Some studies use MSCI ESG scores to measure a firm's sustainability practice (Bae et al., 2019; Bryant et al., 2020; Giese et al., 2019). However, a limitation of the MSCI ESG scores is that it does not fully discount the controversy scores, so the Refinitiv ESGC appears to be superior in terms of measuring the actual ESG performance of a firm.

I calculate a target's relative ESGC score (TRESG) as the ratio of a target's ESGC score to that of a corresponding acquirer at the end of the year prior to the deal announcement. It can be expressed in the following manner:

$$TRESG_{t-1} = \frac{\text{TargetESGC}_{t-1}}{AcquirerESGC_{t-1}}$$

3.3.2.2.   The level of greenwashing

There are various greenwashing measures in the literature. Yu et al. (2020) consider greenwashing as the difference between Bloomberg's ESG disclosure scores and ASSET4's ESG scores. This method faces an issue of ESG rating disagreement due to a lack of a common framework for scoring ESG performance (Brandon et al., 2021; Jacobs & Levy, 2022). Following the selective disclosure approach, Marquis et al. (2016) use the Trucost database to measure greenwashing. Trucost Plc. (2008) states that it collects a firm's self-reported ESG data to examine the environmental impact of 464 business activities. However, it does not account for any accusations of a firm's ESG wrongdoing. Finally, Walker and Wan (2012) assess greenwashing via the substantive and symbolic actions published on a firm's website with a scoring ranging from 1 to 7. This approach appears subjective and is open to replication issues.

Following the greenwashing definition proposed by Seele and Gatti (2017), I employ the ESG controversies score from the Refinitiv ESG Database to proxy a firm's level of greenwashing. The Refinitiv ESG controversies score captures a company's actions against commitments via global media sources. These negative scandals are accused by the market and reported in media sources. Seele and Gatti (2017) highlight that, without market accusation, such behaviors of the firm are considered potential greenwashing. The controversies score estimates the significance and materiality of the impact of negative scandals on a firm's actual ESG performance. The higher the controversies score, the lower the extent of greenwashing. I then calculate the inverse of

the controversies score to proxy the level of greenwashing (AGW). The higher the inverse controversies score, the higher the level of greenwashing.

The ESG scores assess information related to 23 ESG controversies topics. A firm with no controversies is assigned a score of 100, with the lowest score of zero awarded to firms that are associated with extreme controversies. Refinitiv benchmarks the controversies scores within each industry to make the scores comparable. The scores also account for the market capitalization bias, which considers that larger firms attract more media attention than smaller firms (Delmas & Burbano, 2011; Du, 2015; Lyon & Montgomery, 2013). Refinitiv adjusts the raw controversies scores according to severity and capitalization rates to obtain the ESG controversies scores.

I proxy an acquirer's level of greenwashing prior to the deal announcement ($AGWPRE$ or AGW_{t-1}) by utilizing the inverse of its ESG controversies score at the end of the year prior to the deal announcement date. I also measure the change in an acquirer's level of greenwashing between pre- and post-merger in the following manner:

$$AGWCHANGE_{t+1} = \frac{AGW_{t+1}}{AGW_{t-1}} - 1$$

3.3.2.3.   An acquirer's cumulative abnormal return (CAR)

Following Brown and Warner (1985), I employ the market-adjusted model to calculate the cumulative abnormal return (CAR), a proxy of the market reaction to the deal announcement. There is a high probability that acquirers' greenwashing behavior in a pre-merger period is included in the estimation period, so estimating beta is less meaningful. In addition, I use the short-window event study, so weighting market returns by firms' betas does not significantly improve the estimation (Fuller et al., 2002).

Abnormal return (AR) is the difference between stock daily return and the country market return:

$$AR_{i,t} = R_{i,t} - R_{m,t}$$

where $AR_{i,t}$ is the abnormal return of firm i on day t; $R_{i,t}$ is the daily stock return of firm i on day t; $R_{m,t}$ is the respective country market return on day t.

I calculate the cumulative abnormal return (CAR) as follows:

$$CAR_i[m; n] = \sum_{t=m}^{n} AR_{i,t}$$

where [*m;n*] is the event period from *m* days before to *n* days after the deal announcement date. I examine three-day and five-day windows around the deal announcement date. The stocks' daily returns and the respective country market returns are obtained from Refinitiv and Bloomberg, respectively. I further employ the market model to measure the acquirers' CAR as a robustness test.[14]

3.3.2.4.   Control variables

With regard to the first regression of $TRESG_{t-1}$ on $AGWPRE_{t-1}$, I control for several acquirers' and targets' characteristics. Drempetic et al. (2020) indicate that the larger-size and higher-leverage firms have more resources to invest in ESG-related activities, thereby improving their ESG ratings. In contrast, Barnea and Rubin (2010) argue that the higher level of leverage may restrict the free cash flow in the hands of firm managers. It is expected to reduce the ESG overinvestment by those managers, thereby preventing the firms' extremely high ESG ratings. Therefore, I control the market capitalization (MKCAP), total assets (ASSETS), market-to-book ratio (MTB), leverage (LEV), and Return-on-Equity (ROE) of both acquirers and target firms.

In the second regression of CAR on AGW_{t-1}, and the third regression of $AGWCHANGE_{t+1}$ on $TRESG_{t-1}$, I follow Aktas et al. (2011) and Ghitti et al. (2020) to further control deal characteristics apart from the acquirers' and target firms' characteristics, as mentioned above. The deal characteristics include deal size (DSIZE), deal diversification (DDIV), cross-border deals (DCROSS), deals with multiple bidders (DMUL), cash-offer deals (DCASH), and stock-offer deals (DSTOCK). I exclude deal attitude as the sample comprises all friendly deals. Noticeably, Ghitti et al. (2020) and Yu et al. (2020) find that board size (BSIZE), percentage of institutional ownership

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[14] Following Aktas et al. (2011), the abnormal return is measured in the following manner: $AR_{i,t} = R_{i,t} - (\alpha_i - \beta_i R_{m,t})$. α_i and β_i are the estimated ordinary least squares (OLS) regression intercept and slope, respectively. I estimate the market model parameters over the period from day -250 to day -10, where day 0 is the deal announcement date.

(INSTOWN), and percentage of independent directors on Board (IDIR) negatively impact the level of greenwashing due to higher scrutiny. Therefore, I control those three variables in the third regression. Control variable data is obtained from Refinitiv. All control variables are at the end of the year prior to the deal announcement date. Appendix 3.2 describes the measures of all variables.

3.3.3. Data statistics

Table 3.1 presents simple statistics. The acquirers' level of greenwashing pre-merger (AGWPRE) has an average of 0.026 with a standard deviation of 0.063—that is, the average controversies score is 38.96 out of 100. This average is low, thereby indicating that the acquirers are involved in a relatively high level of greenwashing pre-merger. The acquirers' change in level of greenwashing post-merger (AGWCHANGE) is 38.9%, on average, with a standard deviation of 1.446. The mean of the target firms' relative ESGC scores (TRESG) is 0.84, with a standard deviation of 54.4%. Further, the acquirers' accumulative abnormal returns around the deal announcement date (ACAR[-1;+1], and ACAR[-2;+2]) experience an average 1.5% increase.

All the acquisitions are friendly mergers. Almost 70% of the acquirers and target firms belong to the same two-digit-SIC industry. Only 34.2% of deals are undertaken across borders. Only 7% of deals involve more than one bidder, so the competitiveness in deals appears low. Moreover, 6.1% of the deals are offered in cash and 0.8% are in stock, with the remaining deals use a mix of payments.

With regard to the acquirer- and target-level statistics, the acquirers have a larger size in term of total market capitalization and total assets than the targets. The acquiring firms' profitability (AROE) is higher than that of the target firms. In addition, 80.9% of the acquirers' ownership comprises institutional investors and their boards are comprised of 73.9% independent directors.

Table 3.1. Descriptive data.
This table presents the descriptive statistics of the sample including all completed deals from 2006 to 2020. Appendix 3.2 provides definitions of all variables.

Variable	Observations	Mean	Std. dev	Min	Max
AASSETS	489	23.084	1.670	19.045	26.416
ABSIZE	489	10.943	2.588	4	18
ACAR[-1;+1]	344	0.015	0.115	-0.211	0.361
ACAR[-2;+2]	323	0.015	0.122	-0.206	0.434
AGWCHANGE	489	0.389	1.446	-0.900	8.000
AGWPRE	489	0.026	0.063	0.010	0.540
AIDIR	489	0.739	0.189	0.188	1
AINST	489	0.809	0.095	0.425	1
ALEV	489	0.562	0.193	0.108	1.112
AMKCAP	489	23.089	1.670	18.831	26.482
AMTB	489	3.457	4.772	-10.691	30.291
AROE	489	0.173	0.236	-0.932	1.136
DCASH	489	0.061	0.240	0	1
DCROSS	489	0.342	0.475	0	1
DDIV	489	0.323	0.468	0	1
DMUL	489	0.070	0.255	0	1
DSIZE	489	7.953	1.444	3.797	11.282
DSTOCK	489	0.008	0.090	0	1
TASSETS	489	21.621	1.560	18.165	25.004
TLEV	489	0.278	0.186	0	0.916
TMKCAP	489	22.002	1.744	17.928	27.757
TMTB	489	3.668	6.241	-11.615	46.513
TRESG	489	0.840	0.544	0.070	3.166
TROE	489	0.043	0.441	-2.354	2.118

3.3.4. Diagnostic tests

First, I investigate the multicollinearity issue by examining the Pearson's correlations among independent variables. Table 3.2 reports correlations among independent variables and indicates that these variables are not highly correlated. Their Variance Inflation Factors (VIF) are all less than 10. Hence, I can rule out the existence of the multicollinearity issue in the dataset (Mansfield & Helms, 1982).

Table 3.2. Pearson's correlations among variables and their Variance Inflation Factor (VIF).
This table present the correlation matrix among variables and their VIF. Appendix 3.2 provides definitions of all variables. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	VIF
(1) AGWPRE	1												
(2) AGWCHANGE	-0.105**	1											
(3) TRESG	0.052*	-0.150***	1										
(4) ACAR11	-0.235***	-0.088*	0.125**	1									
(5) ACAR22	-0.234***	-0.07	0.089	0.948***	1								
(6) DSIZE	0.162***	0.082*	0.013	-0.249***	-0.301***	1							2.54
(7) DDIV	-0.032	0.229***	-0.043	-0.158***	-0.193***	0.013	1						1.11
(8) DCROSS	0.019	0.190***	-0.174***	0.027	0.005	-0.017	0.083*	1					1.13
(9) DMUL	0.026	0.058	0.041	-0.008	-0.013	0.120***	-0.034	0.057	1				1.03
(10) DCASH	0.037	0.056	-0.045	-0.064	-0.003	-0.166***	0.024	0.05	-0.036	1			1.09
(11) DSTOCK	-0.017	-0.027	0.067	0.068	0.062	0.055	-0.014	0.078*	-0.025	-0.023	1		1.04
(12) AMKCAP	0.309***	0.172***	-0.183***	-0.417***	-0.462***	0.559***	0.155***	0.094**	0.047	0.01	0.063	1	7.62
(13) AASSETS	0.296***	0.165***	-0.171***	-0.377***	-0.428***	0.493***	0.137***	0.097**	0.059	0.024	0.053	0.671***	7.83
(14) ALEV	0.045	0.055	0.057	-0.04	-0.025	0.193***	0.142***	-0.084*	0.04	-0.035	-0.014	0.153***	1.44
(15) AMTB	0.02	0.143***	0.095**	-0.112**	-0.094*	0.114**	0.056	-0.06	-0.015	0.007	0.022	0.162***	1.66
(16) AROE	0.051	0.110**	-0.073*	-0.112**	-0.149***	0.184***	-0.004	-0.023	0.028	0.024	0.031	0.278***	1.28
(17) ABSIZE	0.144***	0.032	0.02	-0.187***	-0.227***	0.363***	0.039	0.094**	0.003	-0.001	-0.033	0.483***	1.58
(18) AINST	-0.192***	-0.120***	-0.003	0.225***	0.241***	-0.073*	-0.051	-0.062	0.005	-0.014	-0.001	-0.293***	1.18
(19) AIDIR	0.153***	0.047	-0.095**	-0.192***	-0.161***	0.206***	-0.092**	-0.107**	0.052	-0.084*	-0.028	0.152***	1.3
(20) TMKCAP	0.06	0.016	0.105**	-0.093*	-0.189***	0.526***	0.031	-0.125***	0.015	-0.155***	0.017	0.358***	1.92
(21) TASSETS	0.047	0.06	0.155***	-0.153***	-0.201***	0.610***	0.017	-0.114**	0.080*	-0.170***	0.087*	0.363***	2.46
(22) TLEV	0.045	-0.011	-0.081*	-0.009	-0.007	0.192***	-0.132***	-0.084*	0.01	-0.142***	0.017	0.051	1.2
(23) TMTB	-0.024	0.039	-0.110**	-0.068	-0.07	0.116**	0	-0.017	0.037	-0.04	0.009	0.139***	1.24
(24) TROE	-0.066	-0.03	-0.003	0.024	-0.036	0.131***	0.061	-0.078*	0.032	-0.016	0.03	0.098**	1.18

Table 3.2. (continued)

Variables	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(13) AASSETS	1											
(14) ALEV	0.280***	1										
(15) AMTB	-0.080*	0.161***	1									
(16) AROE	0.166***	0.088*	0.373***	1								
(17) ABSIZE	0.531***	0.222***	-0.006	0.073*	1							
(18) AINST	-0.282***	-0.075*	-0.122***	-0.019	-0.168***	1						
(19) AIDIR	0.064	0.059	0.112**	0.015	-0.152***	-0.004	1					
(20) TMKCAP	0.382***	0.098**	0.048	0.112**	0.273***	-0.073*	-0.134***	1				
(21) TASSETS	0.469***	0.195***	-0.051	0.083*	0.293***	-0.075*	-0.012	0.590***	1			
(22) TLEV	0.111**	0.240***	-0.021	-0.003	0.130***	-0.031	0.112**	0.031	0.204***	1		
(23) TMTB	0.055	0.135***	0.096**	0.092**	0.106**	-0.078*	0.097**	0.062	-0.126***	0.099**	1	
(24) TROE	0.045	0.089**	0.037	0.154***	0.079*	0.134***	-0.019	0.175***	0.128***	-0.017	0.233***	1

Second, I perform the Breusch-Pagan test to check for the problem of heteroskedasticity (Breusch & Pagan, 1979). Table 3.3 reports that only the Breusch-Pagan test in the regression of ACAR[-1;+1] on AGWPRE is statistically insignificant. The result supports the null hypothesis that the error term has constant variance. The regression is free of the heteroskedasticity issue. Having conducted the statistically significant Breusch-Pagan test, the remaining regressions deal with the issue of heteroskedasticity. As suggested by White (1980), the standard errors are robust in the employed estimations to address such a problem.

Table 3.3. Breusch-Pagan test.
This table presents Breusch-Pagan test examining the problem of heteroskedasticity. The test's null hypothesis confirms that the error term has constant variance, that is, there is no heteroskedasticity issue. As suggested by White (1980), the standard errors are robust in the employed estimations to address such a problem. Appendix 3.2 provides definitions of all variables.

	(1)	(2)	(3)	(4)
Dependent Variable	TRESG	ACAR[-1;+1]	ACAR[-2;+2]	AGWCHANGE
Independent Variable	AGWPRE	AGWPRE	AGWPRE	TRESG
	Breusch-Pagan Test			
	H_0: The error term has a constant variance			
Chi squared (1)	85.09	2.08	6.95	264.18
Prob > Chi squared	0.000	0.1493	0.0084	0.000

3.4. The relationship between an acquirer's level of greenwashing pre-merger (AGWPRE) and a target's relative ESGC score (TRESG)

I perform the following model to examine the relationship between an acquirer's level of greenwashing pre-merger and a target's relative ESG score.

$$TRESG_{i,t-1} = \alpha_0 + \alpha_1 AGWPRE_{i,t-1} + \alpha_2 \sum Controls_{Acquirer,i,t-1} +$$
$$\alpha_3 \sum Controls_{Target,i,t-1} + \gamma + \delta + \epsilon \qquad (3.1)$$

where i is a respective deal; t is the year of deal announcement; $\sum Controls_{Acquirer,t-1}$ is a set of control variables related to acquirers' characteristics; and $\sum Controls_{Target,t-1}$ is a set of control variables related to targets' characteristics. Control variables related to acquirers and targets are lagged by one year prior to the deal announcement. γ is year fixed effect; δ is acquirer and target industry fixed effects; and ε is the error term.

I include a year fixed effect to remove time-varying unobserved heterogeneity from the error term. I additionally account for an acquirer's and a target's industry fixed effects to eliminate other invariant unobserved heterogeneity across industries. I argue that acquirers' levels of greenwashing tend to be correlated within a country due to the impact of the corruption level in that country (Ioannou & Serafeim, 2012). Therefore, I cluster the standard errors in Equation (3.1) at the acquirer country level to account for this possible correlation.

Using the Ordinary Least Squares (OLS) estimate, Column (1) in Table 3.4 confirms that an acquirer with a higher level of greenwashing pre-merger would acquire a target with a higher relative ESGC score. The coefficient of AGWPRE is positive (1.277) and statistically significant at a p-value lower than 0.01. With one standard deviation higher in the level of greenwashing pre-merger, an acquirer would acquire a target with higher relative ESGC score of 1.277 percentage points. AGWPRE and other control variables explain the 22.7% variation in TRESG. Therefore, the result supports Hypothesis 3.1.

Table 3.4. The relationship between an acquirer's level of greenwashing pre-merger (AGWPRE) and a target's relative ESGC score (TRESG).
This table presents the relationship between an acquirer's extent of greenwashing and a target's relative ESGC score pre-merger. Column (1) in this table reports the OLS estimate from the regression. Column (2) and (3) show the first and second stages of the 2SLS estimate from that regression, respectively. Control variables include characteristics of acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and acquirer country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS	2SLS	
		First stage	Second stage
	(1)	(2)	(3)
	TRESG	AGWPRE	TRESG
AGWPRE	1.227***		2.589***
	(4.28)		(4.69)
CORRUPT		-0.006***	
		(-3.53)	
Constant	1.819***	0.398***	1.770***
	(6.15)	(2.68)	(5.11)
Acquirers' characteristics	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes
Acquirer Industry FE	Yes	Yes	Yes
Target Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
F statistics		17139	
Obs.	467	489	489
Adj. R^2	0.227	0.384	0.374

AGWPRE is potentially endogenous, as several factors may drive its variation. For example, corporate culture (Walker & Wan, 2012), Twitter presence (Lyon & Montgomery, 2013), and regulatory pressure (Bowen, 2000; Walker & Wan, 2012) impact a firm's level of greenwashing. I mitigate such a measurement error by employing an instrumental variable and the Two-Stage Least Squares (2SLS) estimate to measure Equation (3.1).

With the international sample, I employ a country's absence of corruption index (CORRUPT) as an instrumental variable for AGWPRE (Ioannou & Serafeim, 2012; Yu et al., 2020). Ioannou and Serafeim (2012) state that firms in a country with a high level of corruption are more likely to engage in unethical practices to reduce their costs, increase market share, and retain their competitiveness. The rewards for ethical behavior

in such countries are low, as the government is less likely to provide incentives for firms to be socially responsible (i.e., tax exemption, financial support, etc.). Following Yu et al. (2020), I obtain a country's absence of corruption index from Transparency International. The index varies from 0 (a highly corrupt country) to 100 (a highly clean country). The higher the value of the variable CORRUPT, the lower the measure of AGWPRE, thereby satisfying the relevance condition. There is no reason to believe that the level of corruption of an acquirer's country has a direct impact on a target's relative ESGC score and an acquirer's abnormal return rather than an indirect effect via the acquirer's greenwashing level pre-merger. Thus, the exclusion restriction is met.

Column (2) in Table 3.4 reveals that the absence of a corruption index (CORRUPT) empirically satisfies the relevance condition of a good instrumental variable. The coefficient of CORRUPT is negative (-0.006) and statistically significant at a p-value lower than 0.01. It is consistent with Ioannou and Serafeim (2012) and Yu et al. (2020), who study that firms located in a country with a low level of corruption are less likely to engage in greenwashing. The F-statistics in that first-stage regression is higher than 10, so the relevance condition is statistically satisfied (Staiger & Stock, 1997).

Column (3) in Table 3.4 presents the second stage of the 2SLS estimate, the result of which is consistent with what is estimated by OLS. AGWPRE positively impacts TRESG with a significant coefficient of 2.589.

The finding regarding the behaviors of a greenwashing acquirer is consistent with the two views explaining its behavior in a green deal. Acquiring a target with a higher ESGC rating, the acquirer sends the market a misleading signal regarding its green transformation (Berrone et al., 2013; Delmas & Burbano, 2011; Lyon & Montgomery, 2013). In contrast, transforming ESG performance could also be a motive for a greenwashing acquirer (Li, Liu, et al., 2020). It could acquire and learn ESG practices from a target with better performance in sustainability. Both circumstances help the acquirer gain legitimacy.

3.5.   The market's response to the deal announcement

3.5.1. Univariate tests

Table 3.5 presents ACAR[-1;+1] for the full sample and subsamples of acquirers with high and low extents of greenwashing pre-merger. Although the mean ACAR[-1;+1] for the full sample and the subsample of acquirers with low AGWPRE is positive, the mean of the subsample of acquirers with high AGWPRE is negative. The mean ACAR[-1;+1] of those two subsamples is statistically significant at the 1% level. The statistics indicate that the market negatively responds to the announcement of deals by high AGWPRE acquirers, compared with those by low AGWPRE acquirers. That is to say, the higher acquirers' extent of greenwashing pre-merger leads to their lower announcement returns.

Table 3.5. Cumulative abnormal returns for acquirers around deal announcement dates.
This table presents the acquirers' cumulative abnormal returns from one day before to one day after the dates of deal announcement. ACAR is measured by using the market-adjusted model. Acquirers with values of AGWPRE greater than the median AGWPRE of the full sample are categorized as high AGWPRE, and low AGWPRE otherwise.

	Full sample (N = 344)		(A) Subsample of acquirers with high AGWPRE: (N = 126)		(B) Subsample of acquirers with low AGWPRE: (N = 218)		Test of difference (A - B)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
ACAR[-1;+1]	0.015	0.028	-0.101	-0.101	0.082	0.088	-0.183***	-0.189***

3.5.2. The influence of an acquirer's level of greenwashing pre-merger (AGWPRE) on its cumulative abnormal return (ACAR)

I estimate the following baseline regression to examine such a relationship:

$$ACAR\,[m;n]_i = \alpha_0 + \alpha_1 AGWPRE_{i,t-1} + \alpha_2 \sum Controls_{Deal,i} +$$
$$\alpha_3 \sum Controls_{Acquirer,i,t-1} + \alpha_4 \sum Controls_{Target,i,t-1} + \gamma + \delta + \varepsilon \qquad (3.2)$$

I additionally control for a set of variables related to deal characteristics ($\sum Coltrols_{Deal}$) besides controlling the acquirers' and targets' characteristics, as in Equation (3.1).

I find that an acquirer's announcement return around the deal announcement date is lower when its level of greenwashing pre-merger is higher. Column (1) in Table 3.6 presents the influence of AGWPRE on ACAR[-1;+1] with the OLS estimate. AGWPRE negatively impacts ACAR[-1;+1] with a coefficient of -0.108, which is significant at a

confidence level of 95%. An acquirer with a level of greenwashing that is one standard deviation higher in its level of greenwashing pre-merger has 0.108 percentage points lower in its cumulative abnormal return from one day before to one day after a deal announcement date. AGWPRE and other control variables explain 27.4% variation of ACAR[-1;+1]. The results remain robust in the 2SLS estimate reported in Column (3) (i.e., the coefficient of AGWPRE is -0.284 and p-value is less than 0.05).

Table 3.6. The relationship between an acquirer's level of greenwashing pre-merger (AGWPRE) and its cumulative abnormal return (ACAR) measured by the market-adjusted model.
This table shows the impact of an acquirer's extent of greenwashing pre-merger on its cumulative abnormal return around the deal announcement date. Column (1) and column (4) present the OLS estimate from the regression of an acquirer's cummulative abnormal return 3 and 5 days around the deal announcement date on the acquirer's greenwashing extent pre-merger, respectively. Column (2) shows the first stage of the 2SLS estimate from that regression while column (3) and (5) exhibit the second stages. ACAR is measured by the market-adjusted model. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS	2SLS First stage	2SLS Second stage	OLS	2SLS Second stage
	(1)	(2)	(3)	(4)	(5)
	ACAR [-1;+1]	AGWPRE	ACAR [-1;+1]	ACAR [-2;+2]	ACAR [-2;+2]
AGWPRE	-0.108**		-0.284**	-0.071*	-0.319**
	(-2.72)		(-2.28)	(-2.04)	(-2.32)
CORRUPT		-0.006***			
		(-3.06)			
Constant	0.514***	0.274*	0.282***	0.727***	0.515***
	(7.02)	(1.69)	(3.11)	(6.72)	(4.53)
Deal characteristics	Yes	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes	Yes
Acquirer Industry FE	Yes	Yes	Yes	Yes	Yes
Target Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
F statistics		24093			
Obs.	324	344	344	301	323
Adj. R^2	0.274	0.371	0.259	0.304	0.269

The effect of AGWPRE on ACAR[-2;+2] experiences a similar trend. As reported in Column (4) in Table 3.6, the coefficient of AGWPRE is -0.071, with a p-value less than 0.1. The model explains 30.4% of the variation in ACAR[-2;+2]. The 2SLS estimate in Column (5) is in line with the OLS estimate. These results also remain robust when using the market model to measure ACAR, as reported in Table 3.7. Therefore, these statistics support Hypothesis 3.2.

Table 3.7. The relationship between an acquirer's level of greenwashing pre-merger (AGWPRE) and its cumulative abnormal return (ACAR) measured by the market model. This table shows the impact of an acquirer's extent of greenwashing pre-merger on its cumulative abnormal return around the deal announcement date. Column (1) and column (4) present the OLS estimate from the regression of an acquirer's cummulative abnormal return 3 and 5 days around the deal announcement date on the acquirer's greenwashing extent pre-merger, respectively. Column (2) shows the first stage of the 2SLS estimate from that regression while column (3) and (5) exhibit the second stages. ACAR is measured by the market model. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS	2SLS		OLS	2SLS
		First stage	Second stage		Second stage
	(1)	(2)	(3)	(4)	(5)
	ACAR [-1;+1]	AGWPRE	ACAR [-1;+1]	ACAR [-2;+2]	ACAR [-2;+2]
AGWPRE	-0.084**		-0.224**	-0.068**	-0.297**
	(-2.42)		(-2.08)	(-2.62)	(-2.21)
CORRUPT		-0.006***			
		(-3.06)			
Constant	0.433***	0.274*	0.221***	0.719***	0.489***
	(6.98)	-1.69	(2.77)	(6.45)	(4.32)
Deal characteristics	Yes	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes	Yes
Acquirer Industry FE	Yes	Yes	Yes	Yes	Yes
Target Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
F statistics		24093			
Obs.	324	344	344	301	323
Adj. R^2	0.260	0.371	0.245	0.284	0.251

I document evidence that the market negatively reacts to the deal announcement.

It perceives the deal as greenwashing by the acquirer, and this finding is consistent with the attribution theory of Parguel et al. (2011). The information asymmetry between a firm and its investors makes it difficult to recognize whether the green claim is misleading (Seele & Gatti, 2017). The investors likely refer to the acquirer's pre-merger greenwashing behavior as they attempt to interpret the deal announcement. The market reaction in this study is in line with Du (2015), who finds that the market negatively responds to a firm's greenwashing practice when the firm is publicly reported as a greenwasher.

3.5.3. *The moderating effect of the targets' relative ESGC scores on the AGWPRE–ACAR relationship*

I further investigate how the impact of AGWPRE on ACAR[-1;+1] and ACAR[-2;+2], respectively, varies in accordance with the target's relative ESGC score. I create a dummy variable, HighTRESG, to indicate the level of TRESG. If a target's relative ESGC score is equal or higher than the median value of the entire sample, I classify it as "High" and record "1", and "0" otherwise. Following Baron and Kenny (1986b), I calculate the interaction between AGWPRE and HighTRESG to examine the moderating effect of HighTRESG on the relationship between the two variables.

I find that the impact of an acquirer's level of greenwashing pre-merger on the market's reaction to the deal is more pronounced when acquiring a target with a high ESGC score. Column (1) in Table 3.8 reveals that the coefficient of AGWPRE× HighTRESG is -0.156 and statistically significant, with a p-value of less than 0.01. These statistics indicate that, all else being equal, acquiring a high ESGC target makes ACAR[-1;+1] lower by 0.156 percentage points compared to acquiring a low ESGC target. As reported in Column (2) in Table 3.8, this effect remains when extending the window of CAR to two days before and two days after the announcement date. In other words, a high relative ESGC score of a target strengthens the negative relationship between AGWPRE and ACAR. The market may perceive the higher ESGC score of a target as a signal that a greenwashing acquirer wants to obtain higher legitimacy through its greenwashing deal. Figure 3.1 illustrates such a strengthening effect.

Table 3.8. The moderating effect of TRESG on the AGWPRE–ACAR relationship.
This table presents how the impact of an acquirer's extent of greenwashing pre-merger on its cummulative abnormal return around the deal announcement date varies according to a respective target's relative ESGC score. HighTRESG is a dummy variable. If a target's relative ESGC score is equal or higher than the median value of whole sample, I classify it as "High" and record "1", and 0 otherwise. Column (1) and (2) show the moderating effect of HighTRESG on the AGWPRE – ACAR[-1;+1] and AGWPRE – ACAR[-2;+2] relationships, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)
	ACAR[-1;+1]	ACAR[-2;+2]
AGWPRE*HighTRESG	-0.156***	-0.115***
	(-7.33)	(-5.13)
AGWPRE	-0.052*	-0.029
	(-2.05)	(-1.41)
HighTRESG	-0.011	-0.006
	(-1.17)	(-0.49)
Constant	0.516***	0.729***
	(7.43)	(6.66)
Deal characteristics	YES	YES
Acquirers' characteristics	YES	YES
Targets' characteristics	YES	YES
Acquirer Industry FE	YES	YES
Target Industry FE	YES	YES
Year FE	YES	YES
Obs.	324	301
Adj. R^2	0.284	0.306
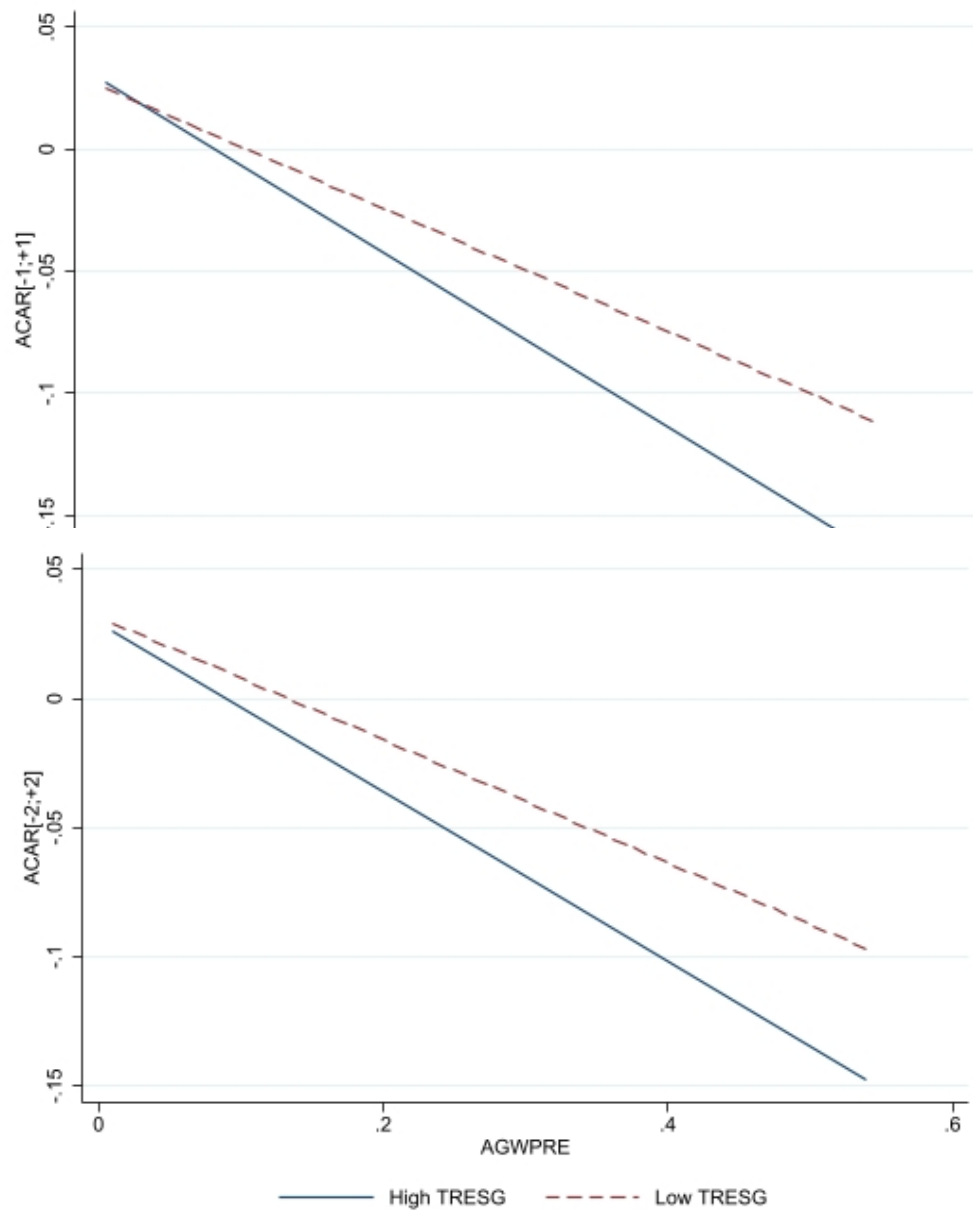
Figure 3.1. The moderating effect of TRESG on the AGWPRE and ACAR relationship.

3.5.4. Placebo test

The potential of overpayment to the targets may drive the market's negative response (Baker et al., 2012). Baker et al. (2012) find that the offer prices are significantly influenced by the most recent 52-week highs of the targets. Using the targets' 52-week highs as an instrumental variable for the offer premiums, they investigate how the market reacts to the offer premiums highly correlated to the targets' 52-week highs. They provide evidence that the market perceives the higher distance of the targets' pre-takeover market prices from their 52-week highs as the higher potential of overpayment with the market

negatively responding to such deal announcements.

Therefore, I follow Baker et al. (2012) to measure the overpayment potential and investigate whether it drives the market's negative response in my research context. The offer price is shown as a percentage difference from the respective target's market price 30 days prior to the deal announcement (OFFERPREM). The 52-week high of a target is its highest price over a 335-day period ending 30 days prior to the announcement date. The 52-week high is then expressed as a percentage difference from the respective target's market price 30 days prior to the deal announcement (T52WKHI).

Column (1) in Table 3.9 presents the regressions of OFFERPREM on T52WKHI. The coefficients of T52WKHI is positive and significant, thereby suggesting that acquirers may use the targets' 52-week highs as a reference point to determine the offer prices. This finding is consistent with Baker et al. (2012). Columns (2) and (3) show how the overpayment potential influences the market-adjusted-model-ACAR using three-day and five-day windows around the deal announcement date, respectively. Columns (4) and (5) report these relationships using the market-model-ACAR. The coefficients of T52WKHI across four regressions are negative but insignificant. Therefore, I rule out the possibility that the market's negative response is driven by the overpayment potential to the targets instead of the perception of further greenwashing toward such deals.

Table 3.9. Market response and potential overpayment.
This table presents whether a deal's overpayment potential drives the market's negative response. OFFERPREM is the offer price shown as a percentage difference from the respective target's market price 30 days prior to the deal announcement. T52WKHI is the target's 52-week high – the highest price over 335-day period ending 30 days prior to the announcement date. The 52-week high is then expressed as a percentage difference from the respective target's market price 30 days prior to the deal announcement. Column (1) shows the regression of OFFERPREM on T52WKHI. Column (2) and (3) present the regressions of ACAR[-1;+1] and ACAR[-2;+2], estimated by the market-adjusted model, on T52WKHI, respectively. Column (4) and (5) display the regressions of ACAR[-1;+1] and ACAR[-2;+2], estimated by the market model, on T52WKHI, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics are reported in parentheses. *** denotes statistical significance at 1% level.

	(1)	Market-adjusted Model		Market Model	
		(2)	(3)	(4)	(5)
	OFFERPREM	ACAR [-1;+1]	ACAR [-2;+2]	ACAR [-1;+1]	ACAR [-2;+2]
T52WKHI	0.156***	-0.003	-0.008	-0.003	-0.006
	(9.76)	(-0.38)	(-0.64)	(-0.41)	(-0.52)
Constant	1.078***	0.532***	0.732***	0.447***	0.726***
	(38.32)	(7.19)	(7.08)	(7.18)	(6.53)
Deal characteristics	Yes	Yes	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes	Yes	Yes
Acquirer Industry FE	Yes	Yes	Yes	Yes	Yes
Target Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Obs.	489	324	301	324	301
Adj. R²	0.162	0.271	0.305	0.257	0.284

3.6. The influence of a target's relative ESGC score (TRESG) on an acquirer's change in the level of greenwashing pre- and post-merger (AGWCHANGE)

I examine how an acquirer changes its level of greenwashing post-merger by performing the following model:

$$AGWCHANGE_{i,t+1} = \alpha_0 + \alpha_1 TRESG_{i,t-1} + \alpha_2 \sum Controls_{Deal,i} +$$
$$\alpha_3 \sum Controls_{Acquirer,i,t-1} + \alpha_4 \sum Controls_{Target,i,t-1} + \gamma + \delta + \varepsilon \qquad (3.3)$$

The legal origin of a particular country may influence a firm's ESG performance in that country (Kim et al., 2017), so I cluster the standard errors in Equation (3.3) at the

target country level.

Performing the OLS estimate, I discover that acquiring a higher ESGC target reduces an acquirer's greenwashing level post-merger. Column (1) in Table 3.10 indicates that TRESG has a negative and significant impact on AGWCHANGE with a coefficient of -0.346 and p-value less than 0.05. When acquiring a target with one standard deviation higher in a relative ESGC score, an acquirer can lower its level of greenwashing post-merger by 0.346 percentage points. These results support Hypothesis 3.3.

Table 3.10. The relationship between a target's relative ESGC score (TRESG) pre-merger and an acquirer's change in the level of greenwashing pre- and post-merger (AGWCHANGE).
This table shows the impact of a target's ESGC score pre-merger on an acquirer's change in the level of greenwashing pre- and post-merger. Column (1) in this table reports the OLS estimate from the regression. Column (2) and (3) show the first and second stages of the 2SLS estimate from that regression, respectively. Control variables include characteristics of deals (DSIZE, DDIV, DCROSS, DMUL, DCASH, DSTOCK), acquirers (AMKCAP, AASSETS, ALEV, AMTB, AROE, ABSIZE, AINST, AIDIR) and of targets (TMKCAP, TASSETS, TLEV, TMTB, TROE). Appendix 3.2 provide definitions and measures of all variables. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and target country clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	OLS	2SLS	
	(1)	(2)	(3)
	AGWCHANGE	TRESG	AGWCHANGE
TRESG	-0.346**		-0.052*
	(-2.48)		(-1.70)
LEGAL		0.700***	
		(5.45)	
Constant	-2.431	1.856***	-4.085**
	(-1.35)	(3.34)	(-2.10)
Deal characteristics	Yes	Yes	Yes
Acquirers' characteristics	Yes	Yes	Yes
Targets' characteristics	Yes	Yes	Yes
Acquirer Industry FE	Yes	Yes	Yes
Target Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
F statistics		3521	
Obs.	478	489	489
Adj. R^2	0.112	0.430	0.237

The measurement error of TRESG in Equation (3.3) is a potential source of endogeneity. Several factors determine a firm's ESG scores, such as the ESG scores in previous years (Bae et al., 2019), religion rank of a firm's headquarter location (Deng et

al., 2013), and the state where its headquarter is located (Rubin, 2008). I address such a potential issue by using an instrumental variable for TRESG and the 2SLS to estimate Equation (3.3).

Following Kim et al. (2017), I account for the legal origins (LEGAL) of the countries in which the targets are located as an instrumental variable for TRESG. Most countries follow one of two primary legal systems: civil law or common law. Compared to common law, civil law is characterized by a more concentrated ownership structure, which has a high level of managerial shareholding. It motivates managers to pay attention to long-term investments and performance. The civil law system focuses on maximizing stakeholder value, while the common law regime emphasizes the shareholders' wealth and the protection of investor rights (Porta et al., 1998). This is why civil-law-based firms tend to have a greater extent of socially responsible investment than those located in common-law-countries, thereby improving ESG ratings (Kim et al., 2017). Therefore, LEGAL theoretically satisfies the relevance condition of a good instrumental variable. There is no reason to believe that the targets' legal origins have a direct impact on the acquirers' ESG ratings rather than an indirect effect via the targets' ESG performance, which could be acquired by the acquirers. Hence, the exclusion restriction is met. I account for only one instrumental variable for one endogenous variable in each regression, so my models are just-identified. LEGAL is recorded as "1" if the target firm is located in a civil law country and 0 in a common law country. Table 3.11 depicts the target firms' countries classified as common law and civil law according to Porta et al. (1998).

Table 3.11. The legal origins of the target firms' countries.
This table displays the legal origins of countries where targets are located according to Porta et al. (1998).

Country	Legal origins	Country	Legal origins
Netherlands	Civil law	Russian Fed	Civil law
Australia	Common law	United Kingdom	Common law
Hong Kong	Common law	South Korea	Civil law
United States	Common law	Sweden	Civil law
Switzerland	Civil law	South Africa	Common law
Japan	Civil law	Germany	Civil law
Spain	Civil law	France	Civil law
Papua N Guinea	Common law	Taiwan	Civil law
India	Common law	Norway	Civil law
Canada	Common law	Israel	Common law
Greece	Civil law	Finland	Civil law
Mexico	Civil law	Singapore	Common law
Austria	Civil law	Argentina	Civil law
Brazil	Civil law	Cyprus	Common law
Italy	Civil law	Malaysia	Common law
Ireland Rep.	Common law	China	Civil law
Thailand	Common law	New Zealand	Common law
Morocco	Civil law	Poland	Civil law

The finding is robust with the 2SLS estimate reported in Columns (2) and (3) in Table 3.10. Column (2) shows the first-stage regression with LEGAL as an instrumental variable for TRESG. The legal origin of a target firm's country has a positive and significant impact on its relative ESGC rating (i.e., a coefficient of 0.7 and p-value less than 0.01). It is consistent with Kim et al., (2017) stating that civil-law-based firms tend to have higher ESG scores than those located in common-law-countries. It empirically confirms the relevance condition of a good instrumental variable with an F-value greater than 10. The second stage presented in Column (3) supports the negative influence of TRESG on AGWCHANGE, with a coefficient of -0.052 and p-value lower than 0.1.

This finding is in line with the view related to transforming the ESG practice of a greenwashing acquirer (Li, Liu, et al., 2020; Li, Xu, et al., 2020). After successfully integrating a target's ESG practice, a greenwashing acquirer could improve its ESG performance and reduce greenwashing activities. Accused by external stakeholders, greenwashing behaviors bear costs to a greenwashing firm, such as lower signal reliability, legitimacy, and firm financial performance. Therefore, going green via green

deals could help firms—particularly greenwashing firms—sustain their businesses, although the costs of ESG practice appear high and the ESG-related benefits take time to realize.

Overall, although acquiring a green target helps a greenwashing acquirer transform its ESG practice, the market does not immediately trust in the company's intention of going green. These findings confirm the green transformation post-merger of a greenwashing acquirer with a decrease in its level of greenwashing in the post-takeover period. This finding is consistent with Nguyen et al. (2022), who find that acquiring a target with higher relative ESGC ratings could enhance an acquirer's ESG performance post-merger. It comprehensively confirms the green transformation of a greenwashing acquirer when involved in a deal with a better-ESG target, even if the market is initially skeptical due to the past behavior of the acquirer.

3.7.   Conclusion

In this chapter, I find that greenwashing acquirers genuinely transform their sustainability practices by acquiring firms with better ESG practices. After eliminating the hypothesis that the acquirer is overpaying for the target, the negative return around the deal announcement suggests that the market perceives the transaction as being motivated as a means for the acquirer to further greenwash to mask poor environmental practices. However, acquirers exhibit a reduction in greenwashing following the deal, thereby suggesting that the acquirer incorporates the target's superior environmental credentials and transforms its own operations.

There are several practical implications of these results. First, acquiring a higher ESG-rated firm is a strategic solution for firms to initially reduce greenwashing and transform ESG practice. Regulators could refer to this finding to guide firms, who engage in greenwashing, to improve their sustainability practices. Second, when transforming ESG practice through green M&A deals, the managers of acquiring firms should focus on communicating deal motives and the up-to-date integration process to the market. The market uses the acquirer's past greenwashing behavior to interpret the signal, so evidence is necessary to overcome their reputation for greenwashing. Clear, detailed, and informative communication—particularly around the planned adoption of ESG practices—may help to compensate for the firm's bad reputation and may reduce the

market's negative response around the deal announcement date. Third, understanding how the market reacts to such deals provides investors a reference to make investment decisions related to these deals.

Further research could explore which factors drive the ESG-related integration process of an acquirer and impact the acquirer's overall ESG practices. These factors could provide a comprehensive framework regarding the details required to use a green acquisition as an ESG transformation channel.

Appendix 3.1. Sample distribution by announcement year

This appendix describes the number of M&A deals across years. The second column reports the number of deals. The third column shows the number of cross-border deals, in which acquirers' and targets' nations are different. The forth column displays the number of cross-industry deals, in which acquirers' and targets' industries are different.

Year	# Deals	# Cross-border deals	# Cross-industry deals
2006	5	4	1
2007	7	4	1
2008	15	3	6
2009	16	5	6
2010	21	10	8
2011	29	10	5
2012	27	10	11
2013	16	4	7
2014	39	12	12
2015	47	16	14
2016	52	22	20
2017	51	19	21
2018	67	22	21
2019	64	22	15
2020	33	9	10
Total	**489**	**172**	**158**

Appendix 3.2. Variable measures

This appendix describes the abbreviations and measures of all variables in the study.

Variable	Abbreviation	Measure
Deal size	DSIZE	Natural logarithm of total deal value in U.S. dollars
Deal diversification	DDIV	1 if the 2-digit-SIC industries of the target and the acquirer are different, 0 otherwise
Cross-border deal	DCROSS	1 if the nations of the target and the acquirer are different, 0 otherwise
Multiple bidder deal	DMUL	1 if the deal involves more than one bidder, 0 otherwise
Cash-offer deal	DCASH	1 if the deal is offered by 100% cash, 0 otherwise
Stock-offer deal	DSTOCK	1 if the deal is offered by 100% stocks, 0 otherwise
Acquirer's market capitalization	AMKCAP	Natural logarithm of an acquirer's total market capitalization at the end of the year prior to the deal announcement
Acquirer's extent of greenwashing pre-merger	AGWPRE	The inverse of the Refinitiv ESG controversies score at the end of the year prior to the deal announcement
Acquirer's change in the extent of greenwashing post-merger	AGWCHANGE	The percentage of change in an acquirer's inverse ESG controversies scores from one year before to one year after the deal announcement
Acquirer's cumulative abnormal return	ACAR	*First*, the abnormal return (AR) is calculated. I employ two models to calculate AR. • Market-adjusted model (Brown & Warner, 1985): AR is the difference between stock daily return and the country market return ($AR_{i,t} = R_{i,t} - R_{m,t}$). • Market model (Aktas et al., 2011): The abnormal return is measured as follows: $AR_{i,t} = R_{i,t} - (\alpha_i - \beta_i R_{m,t})$. α_i and β_i are the estimated ordinary least squares (OLS) regression intercept and slope, respectively. The market model parameters are estimated over the period from day -250 to day -10, where day 0 is the deal announcement date. *Second*, the cumulative abnormal return (CAR) is calculated as follows: $CAR_i[m;n] = \sum_{t=m}^{n} AR_{i,t}$ [m;n] is the event period from m days before to n days after the announcement date. I examine 3-day and 5-day windows around the deal announcement date.

Acquirer's total assets	AASSETS	Natural logarithm of an acquirer's total assets at the end of the year prior to the deal announcement
Acquirer's market-to-book value	AMTB	A target's market-to-book value of equity at the end of the year prior to the deal announcement
Acquirer's leverage	ALEV	An acquirer's total debts-to-total assets ratio at the end of the year prior to the deal announcement
Acquirer's return-on-equity	AROE	An acquirer's net income divided by its total stockholders' equity at the end of the year prior to the deal announcement
Acquirer's Board size	ABSIZE	An acquirer's total Board members at the end of the year prior to the deal announcement
Acquirer's percentage of institutional ownership	AINSTOWN	An acquirer's the percentage of institutional ownership at the end of the year prior to the deal announcement
Acquirer's percentage of independent directors	AIDIRECT	An acquirer's the percentage of independent directors at the end of the year prior to the deal announcement
Target's ESG performance	TRESG	The ratio of a target's ESG Combined (ESGC) score to that of a corresponding acquirer at the end of the year prior to the deal announcement
Target's market capitalization	TMKCAP	Natural logarithm of a target's total market capitalization at the end of the year prior to the deal announcement
Target's total assets	TASSETS	Natural logarithm of a target's total assets at the end of the year prior to the deal announcement
Target's market-to-book value	TMTB	A target's market-to-book value of equity at the end of year prior to the deal announcement
Target's leverage	TLEV	A target's total debts-to-total assets ratio at the end of the year prior to the deal announcement
Target's return-on-equity	TROE	A target's net income divided by its total stockholders' equity at the end of the year prior to the deal announcement

Chapter 4

Socially Responsible Investing Fund Ownership and ESG Performance: Evidence from U.S. Spin-Offs

4.1. Introduction

SRI incorporates ESG factors into the investment analysis and decision-making process to provide both financial and social benefits. SRI has expanded globally over the last several decades, particularly in the U.S. As illustration, the total amount of assets managed by SRI funds in the U.S. increased by a factor of 25, from US$636 billion in 1995 to US$16.6 trillion in 2020 (US SIF, 2020).[15]

However, despite this substantial pool of assets, it is not clear whether SRI funds have a positive effect on firms' sustainability practices. Dyck et al. (2019) find that SRI funds actively engage with managers to enhance firms' social responsibilities through actions such as nominating for Board-level positions, disclosing their voting record for climate-related proposals, escalating their own shareholder proposals, or privately engaging with management on prominent issues such as addressing a firm's impact on the changing climate. In contrast, Heath et al. (2022) find that SRI funds invest in firms that already demonstrate superior ESG practices and, consequently, have little economic incentive to engage with firms to encourage greater CSR. The relatively higher cost of actively engaging with management on climate-related matters deters SRI funds from such a strategy and favors the lower-cost strategy of investing in firms that already exhibit strong CSR, particularly climate-related. The extent of SRI fund engagement also varies across firm characteristics and institutional settings, such as firms' existing corporate governance practices, the relationship among institutional shareholders (Dimson et al., 2015), and the ESG standards of countries where firms are located (Dyck et al., 2019).

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[15] The 2020 SRI AUM in the U.S. accounts for 48% of global SRI investment (GSIR, 2020)

This chapter investigates whether SRI funds impact the ESG performance of firms in their portfolio by analyzing changes in SRI ownership levels around corporate spin-offs. A spin-off involves a parent firm divesting specific assets into a subsidiary via a pro-rata distribution of shares to the parent firm's shareholders. As spin-offs are an in-specie distribution, no cash is raised by the parent firm. Therefore, spin-offs are an ideal setting to analyze because spin-offs are not motivated by financing-related reasons. Instead, spin-offs represents an effort by firms to clarify their corporate strategy and reduce information asymmetry (Bergh et al., 2008).

In this chapter I propose that SRI funds actively engage with firms to improve their ESG practices through spin-offs. Compared to the parent firm investing additional resources to improve the ESG characteristics of certain assets with poor ESG attributes, divesting those assets through a spin-off is a faster and more certain alternative. Such a strategy enables the parent firm to both sharpen its ESG policies and respond to the ESG-related demands of its stakeholders, particularly SRI funds, and obtain ESG legitimacy (Bowen, 2000).

My research examines the impact of a firm's SRI ownership on the change in its ESG rating around the announcement of the spin-off. I use the FactSet ownership database and a list of SRI funds from Morningstar and United Nations Principles for Responsible Investment (UNPRI) to measure SRI ownership at the firm level. I define SRI ownership as the proportion of a firm's equity held by SRI funds. I employ the ESG Combined Scores (ESGC) from Refinitiv to measure a change in a firm's ESG rating. Then, I study how the impact of a firm's SRI ownership varies across a firm's characteristics, such as the extent of financial constraint, industry, and current ESG practices. Finally, I explore whether the change in ESG rating following a spin-off attracts more SRI capital.

I find that both the selection and engagement effects exist in this study. Although the ESG ratings of firms prior to a spin-offs are relatively low, the average of ESG ratings of firms with SRI ownership appears higher than that of firms without SRI ownership. SRI funds select firms performing better in ESG but still having room for improvement. SRI funds then engage with firms to improve their ESG practices via spin-offs. I find that a firm's SRI ownership prior to a spin-off is positively related to its ESG improvement following the spin-off. A one standard deviation increase in the percentage of SRI

ownership in the year prior to the spin-off is associated with a 3.30 percentage point higher ESG rating. I find the same positive relationship between SRI ownership and ESG rating when I extend the SRI pre-ownership window from one year prior to the spin-off to a two-year window and a three-year window. My analysis reveals that SRI ownership two years prior to a spin-off has the largest impact on a firm's ESG rating after the spin-off.

I then explore the channel through which SRI funds engage with firms to transform their sustainability practices through an analysis of shareholder proposals. Using the number of ESG-related proposals submitted by SRI funds as a plausible instrumental variable, I document that SRI-fund ownership levels significantly positively affect the change in a firm's ESG rating. This finding shows that ESG proposals partially mediate the positive SRI fund-ESG rating relationship. I also use the change in SRI ownership to explore if SRI funds exert their influence over firms to change their ESG behavior, such as encouraging a spin-off to improve the parent firm's ESG practices or if they simply sell the stocks from their portfolio. My findings confirm that the change in SRI ownership has a significant impact on the change in ESG performance of the firm. Thus, I discount the possibility that SRI funds divest their equity ownership as a strategy to effect change in the ESG behavior of a firm.

I also find that the extent of the relationship between SRI ownership and the change in ESG rating varies depending on several firm characteristics. First, the relationship is more pronounced when the firm has greater financial constraints. Firms with greater financial constraints have to deal with difficulties in accessing additional funds, so improving ESG practices may help them address this issue. An ESG improvement lowers firms' information asymmetry and cost of capital; moreover, it enables easier access to capital markets (Cheng et al., 2014). Following this rationale, SRI funds engage with firms with financial constraints to improve their ESG performance. Second, I find that the relationship is stronger when the firm has a lower ESG score prior to the spin-off. Firms with lower ESG ratings have a greater potential to improve their ESG practices and, therefore, gain more from doing so. These larger economic benefits incentivize SRI funds to engage in a firm's strategies, particularly those related to its ESG practices. My results are in contrast with Heath et al. (2022), who find that SRI funds invest in firms that already demonstrate higher levels of ESG ratings

rather than the higher-cost approach of engaging with lower-rated ESG firms to develop proposals to improve their corporate practices. Third, the extent of the relationship between SRI ownership and a change in ESG performance is strengthened when the firm is in an ESG-sensitive industry. Operating in such an industry makes the firm's visibility higher.

Through additional analysis, I find that a firm's higher ESG rating after a spin-off is positively associated with higher levels of SRI ownership after the spin-off. A one standard deviation increase in the ESG score leads to 0.743 percentage points higher SRI ownership after a spin-off. In addition, I find that a one unit increase in ESGC scores results in 2.760 increase in the log-odds of attracting new investment from SRI funds that had not invested in the firm prior to its spin-off. In other words, the improved ESG rating following a spin-off attracts new SRI investors.

This study makes several contributions. First, I provide evidence of the selection and engagement of SRI shareholders through ESG proposals to improve a firm's ESG practices in the context of spin-offs. This finding is consistent with the stakeholder theory, which contends that stakeholders' expectations shape an organization's behavior (Friedman & Miles, 2002). SRI funds with ESG preferences use ESG proposals to raise concerns and request for improved corporate practices among firms that are included in their portfolios. Under such pressure, firms use spin-offs as a method to divest any units with poor ESG practices. I use corporate spin-offs as a means to study the relationship between SRI fund ownership and ESG practices to help distinguish between the two prevailing views on the role of SRI funds. Dyck et al. (2019) report that SRI investors engage with firm management in an attempt to effect improved ESG practices. On the other hand, Heath et al. (2022) argue that SRI investors select high ESG-rated firms as the cost of changing firms' behavior and the cost of identifying and investing in firms that currently exhibit superior ESG practices. In the context of spin-offs, my results support the hypothesis that SRI owners influence parent firms to improve their ESG behavior, which in turn increases the percentage of SRI ownership and attracts an increased number of SRI investors after divesting ESG-sensitive units.

Second, I explore the factors that drive the positive relationship between ESG ratings and SRI fund ownership levels. The influence of SRI owners is more pronounced when a firm has more financial constraints, lower ESG scores, and operates in an ESG

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sensitive industry. These factors contribute to the set of factors that impact the relationship between SRI ownership and ESG behavior of a firm, such as the ESG norms in the country where a firm is located (Dyck et al., 2019), the cooperation among institutional investors, and the current corporate governance practices (Dimson et al., 2015).

Third, I find increased SRI-fund ownership following increased ESG ratings associated with spin-offs. This finding supports the literature on the documented benefits of strong sustainability practices, such as higher reputation (Branco & Rodrigues, 2006), lower information asymmetry (Benlemlih & Bitar, 2018; Cui et al., 2018), lower cost of capital (Amel-Zadeh & Serafeim, 2018; Fatemi et al., 2015), and higher institutional ownership (Fu et al., 2020; Liang & Vansteenkiste, 2022). In addition, my empirical evidence of an ESG improvement following spin-offs enriches the literature on the benefits of corporate restructuring through the divestiture of units with weak ESG ratings, such as greater clarity of a firm's strategy and higher financial gains (Bergh et al., 2008), higher share price (Aggarwal & Garg, 2019), and positive announcement returns (Chemmanura & Yan, 2004).

My study has several practical implications. From the corporate management perspective, managers may use spin-offs as a strategy to divest assets with poor ESG practices and consequently improve the ESG performance of the parent firm. My empirical results suggest support for a strategy of firms engaging with their SRI fund owners, who are typically experienced in corporate ESG-related matters, to effect meaningful improvements in ESG practices. Furthermore, I find that the involvement of SRI owners to pursue a spin-off attracts further SRI-fund capital. Finally, my study serves as a reference to SRI investors in their portfolio construction process. SRI funds may incorporate firm characteristics such as the extent of financial constraint, current ESG practices, and the industry in which the firm operates. These factors enlarge SRI investors' influence on corporate ESG improvement via spin-offs, thereby increasing the marginal benefits associated with good ESG practices. These economic benefits incentivize SRI funds to engage with firm management.

The rest of the chapter is structured in the following. Section 2 reviews relevant SRI and spin-off literature to form my hypotheses. Section 3 describes the methods employed. Section 4 presents the data analysis and discusses the findings. Section 5

concludes my findings.

4.2.   Related literature

4.2.1.   The impact of SRI on firm performance

SRI is an investment approach that incorporates sustainability factors (e.g., environment, global supply chain, product safety, workplace policies, etc.) (*The Morningstar Sustainable Investing Handbook*). SRI, impact investing, sustainable investing, and ESG investing are often used interchangeably. The approach emphasizes both financial returns and positive ESG changes. The PRI contend that investors can invest responsibly by either considering firms that address ESG issues when constructing a portfolio or improving their portfolio firms' ESG performance via active ownership (UNPRI). However, whether SRI has any real impact on firms' ESG practices is debatable (Dyck et al., 2019; Heath et al., 2022).

There are two strategies that SRI funds can adopt to influence the ESG performance of firms. Through active ownership, SRI funds are often successful in changing the behavior of firms (McCahery et al., 2016). Dyck et al. (2019) show that institutional investors are able to improve firms' ESG performance through private engagement. Institutions can attempt to influence the behavior of firms by communicating with senior management, conducting proxy voting, and filing shareholder proposals (Amel-Zadeh & Serafeim, 2018; Dawkins, 2018; Krueger et al., 2020). Dawkins (2018) concludes that SRI funds should employ engagement and divestment strategies in tandem to address firms' ESG issues. The divestment approach serves as a credible threat to change firms' sustainability behavior significantly. Edmans et al. (2022) illustrate indirect engagement, where investors exclude all firms in high-carbon emitting industries (i.e., known as brown industries) but still invest in the best-in-class brown firm if it takes corrective actions. This strategy, known as "tilting", incentivizes managers to address ESG-related issues. Successful indirect engagement is also shown to increases firms' financial performance (Amel-Zadeh & Serafeim, 2018), institutional ownership and positive abnormal returns (Dimson et al., 2015), and socially optimal outcomes (Broccardo et al., 2022). The extent of such engagement varies across the level of ESG in a particular country (Dyck et al., 2019), the cooperation among institutional shareholders and firms' current governance practices (Dimson et al., 2015).

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Unlike private engagement, a screening strategy without any engagement of SRI investors appears to have no significant impact on firms' ESG behavior. Heath et al. (2022) find that SRI funds simply select firms that already have good ESG practices (i.e., selection effect)—such as lower pollution, better workplace safety, and higher board diversity—instead of engaging with firms to change their behavior (i.e., treatment effect). Investors are less likely to engage in improving a firm's ESG practices due to the relatively higher cost of engagement (Friedman & Heinle, 2021) and a lack of resources and expertise to exert engagement (Heath et al., 2022). However, Renneboog et al. (2008) find that, with the negative screening method, SRI investors exclude polluting firms from their portfolios, thereby resulting in a decrease in such firms' share price and an increase in their cost of capital. When the cost of capital exceeds that of socially responsible firms, such polluting firms will become more environmentally friendly. Edmans (2011) find that although higher SRI ownership results in higher stock returns, no evidence of SRI engagement was found. Their study shows that, utilizing a screening approach, these SRI funds invest in firms with a high degree of employee satisfaction, thereby leading to higher stock prices. In addition, while a campaign from financial institutions pressures firms and reduces their greenhouse gas emissions (Choi et al., 2021), this approach fails to make an impact unless shareholders are also socially responsible (Broccardo et al., 2022).

4.2.2. The impact of spin-offs on firm performance

A spin-off is one of several strategies available to a firm in order to divest a division.[16] In a spin-off, the operations and management of the divested unit are separated from those of the parent (Krishnaswami & Subramaniam, 1999). The shares of the divested entity are then distributed on a pro-rata basis to the firm's existing shareholders. Consequently, a spin-off involves neither cash transactions nor dilution of equity.

Firms employ spin-offs as a strategic corporate restructure (Montgomery et al., 1984). Consistent with the behavioral theory of firms, Kolev (2016) finds that the poor performance of a division and a desire to improve internal efficiency motivates firms to spin-off such a unit. In addition, Bergh et al. (2008) show that spin-offs clarify organizational strategies, reducing firms' information asymmetry. This increased

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[16] Divestment includes split-up, carve-out, sell-off, and spin-off (Brauer, 2006).

transparency lowers their cost of equity and increases the access to external capital (Krishnaswami & Subramaniam, 1999). Through spin-offs, firms avoid sending negative signals in relation to liquidation and ineffective operational issues such as sell-offs (Montgomery et al., 1984).[17]

Therefore, spin-offs have a positive impact on firm performance. Spin-offs enable investors to evaluate firms more accurately (Bergh et al., 2008). In addition, undervalued firms prefer this type of divestment (Aggarwal & Garg, 2019). Aggarwal and Garg (2019) find that spin-offs positively influence the parent firm's share price. Spin-offs improve the parent firm's technological performance due to the increase in environmental realignment in the U.S. hard disk drive industry (McKendrick et al., 2009) and innovation performance in the Italian pharmaceutical industry (Peruffo et al., 2014). Firms also experience positive financial gains around spin-off announcements, long-term abnormal stock returns, and long-term operating performance (Bergh et al., 2008; Chemmanura & Yan, 2004).

4.2.3. SRI, spin-offs, and firms' sustainability practice

According to the stakeholder theory, an organization's strategies and behavior is shaped by its stakeholders (Friedman & Miles, 2002). Consequently, the interest in sustainability of SRI owners may motivate firms to improve their ESG practices. Amiri et al. (2022) find that firms with a stronger stakeholder focus are more likely to facilitate spin-offs that align with stakeholders' interest. Therefore, I argue that SRI shareholders positively impact firms' sustainability practices. Nguyen et al. (2022) find that firms could improve their sustainability performance when acquiring targets with better ESG practices. Apart from M&As, divestment strategies improve a firm's sustainability performance (Murray, 2022). This is because the spinning off of poor performing ESG business units increases the average ESG of the parent firm if the firm is still performing well in its core businesses. Such a strategy not only improves the parent firms' ESG performance but also maintains post-restructuring financial benefits from the divested units (Bergh et al., 2008).

SRI owners have the option of engaging with firms, particularly those with

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[17] Sell-off is to sell assets to another firms in exchange for cash and/or securities (Bergh et al., 2008)

relatively poor ESG performance. One such avenue available to them is spin-offs. Therefore, I propose the following hypothesis:

Hypothesis 4.1: A larger proportion of SRI ownership of a firm pre-spin-off is associated with greater ESG improvement of a firm post-spin-off.

Financial constraints are defined as the extent of difficulty a firm faces in accessing funding to finance its investments (Ahamed et al., 2022). More financially constrained firms experience a higher cost of equity and a higher probability of bankruptcy (Hennessy & Whited, 2007). As a result, financial constraints impact firms' investment decisions, financing policies, and corporate strategies (Kaplan & Zingales, 1997). As a result of the high demand for funding that such financial constraints impose, SRI owners have a stronger influence on firms' strategies, thereby leading to an improvement in the firms' sustainability practices.

Good ESG practices lead to several financial benefits for firms, including lower information asymmetry (Benlemlih & Bitar, 2018; Cui et al., 2018). It also results in a lower cost of equity (Dhaliwal et al., 2011), a lower cost of debt (Bae et al., 2019), and a lower cost of capital (Amel-Zadeh & Serafeim, 2018; Fatemi et al., 2015). These benefits help firms lower their financial constraints and improve their access to financial markets (Cheng et al., 2014). In addition, raising capital via spin-offs—compared to other types of divestments—is more sensible as it does not send signals of liquidity and operational inefficiency to the market. Therefore, I argue that SRI owners engage more in influencing firms to spin-off poor performing ESG units especially for firms with a greater level of financial constraints. Thus, I hypothesize that:

Hypothesis 4.2: The positive relationship between a firm's proportion of SRI ownership pre-spin-off and its ESG improvement post-spin-off is more pronounced when it has greater financial constraints pre-spin-off.

In addition, firms with a lower ESG rating have more scope for ESG improvement. Hence, I propose that:

Hypothesis 4.3: The positive relationship between a firm's proportion of SRI ownership pre-spin-off and its ESG improvement post-spin-off is more pronounced when it has a lower ESG rating pre-spin-off.

Firms operating in ESG-sensitive industries pay greater attention to their sustainability practices (Lyon & Maxwell, 2011). They have greater exposure to the concerns of ESG activists (Lyon & Maxwell, 2011), social media (Lyon & Montgomery, 2013), and public policies and regulations (Cho & Patten, 2007). Such firms have higher visibility to the public, and it is this visibility that induces the firm's response to public demands in order to maintain its social legitimacy (Bowen, 2000). Thus, due to the market demand for better ESG practices, SRI owners are able to influence firms' ESG practices to a greater extent in ESG-sensitive industries. In this vein, I propose the following hypothesis:

Hypothesis 4.4: The positive relationship between a firm's proportion of SRI ownership pre-spin-off and its ESG improvement post-spin-off is more pronounced when it operates in an ESG-sensitive industry.

As discussed above, firms with better ESG performance can more easily access capital markets. An ESG improvement due to spin-offs assists firms in reducing their information asymmetry. This, in turn, lowers their cost of capital and improves their ability to raise more capital. Fu et al. (2020) find that an ESG improvement increases profits and lowers risks, thereby enhancing shareholder value. The authors show that firms in the gambling industry increase their SRI ownership as they improve their ESG performance. In addition, Liang and Vansteenkiste (2022) find that for firms with greater gender diversity on their boards, attract more SRI capital. Thus, I propose that:

Hypothesis 4.5: A firm's ESG improvement following a spin-off is positively associated with its change in SRI ownership post-spin-off.

Hypothesis 4.6: A firm's ESG improvement following a spin-off attracts new investment from SRI funds.

4.3.   Methods

4.3.1.   Sample description

I obtain data on all U.S. spin-offs from Thomson Securities Data Company (SDC) Platinum Mergers and Acquisitions Database that satisfy the following criteria. Deals are reported to have been completed between January 1, 2006, and December 31, 2020. Firms

are in non-financial industries (that is, I exclude firms with Standard Industrial Classification (SIC) codes between 6000 and 6999). ESG ratings, accounting-, and market-based data are available in Refinitiv from one year before to one year after the year of spin-off. Appendix 4.1 reports the distribution of my final sample of 221 spin-offs.

4.3.2. Variable measures

4.3.2.1. SRI ownership

Following Heath et al. (2022), I define SRI ownership (SRIOS) as the proportion of a firm's ownership held by SRI funds. First, I obtain the firm's list of institutional owners and their respective ownership from FactSet. The ownership data is from three years prior to the firm's year of spin-off to two years after the event. Second, I identify SRI funds among those institutional owners to calculate the total SRI ownership. I define SRI funds as those who are signatories of the UNPRI. Signing the UNPRI publicly demonstrates the signatories' commitment to SRI. This platform also provides the signatories with guidance and tools to practice SRI. The UNPRI consists of 3,826 signatories with US\$121.3 trillion of AUM as of 2021. I then combine the list of SRI funds from UNPRI to the list of SRI funds from Morningstar. Funds categorized as SRI ones by Morningstar have sustainability ratings and identify themselves as responsible investors (Liang & Vansteenkiste, 2022).

Additionally, I measure a firm's change in SRI ownership after its year of spin-off (t). I calculate the percentage SRI ownership change between one year after and one year prior to the year of spin-off ($SRIOSChange_{t+1}$). Similarly, I estimate $SRIOSChange_{t+2}$ as the percentage change between two years after and one year before the spin-off.

$$SRIOSChange_{t+1} = \frac{SRIOS_{t+1} - SRIOS_{t-1}}{SRIOS_{t-1}}$$

$$SRIOSChange_{t+2} = \frac{SRIOS_{t+2} - SRIOS_{t-1}}{SRIOS_{t-1}}$$

4.3.2.2. ESG performance

I measure a firm's ESG performance by employing the ESG combined (ESGC) score. Mobius and Ali (2021) state that a primary limitation of ESG ratings is that they are based on firms' self-disclosed information, thereby resulting in an inaccurate measure of its actual ESG performance. Following Rajesh and Rajendran (2020), I proxy a firm's ESG performance by the ESGC scores provided by Refinitiv, whose database covers over 11,000 firms globally since 2002. Assessing over 500 ESG data points that are grouped into three pillars (i.e., ESG) and ten categories, Refinitiv calculates ESG scores measuring a firm's ESG performance, commitment, and effectiveness based on company-reported data. Further, Refinitiv applies a percentile rank score method to make ESG scores comparable within an industry. These scores are then benchmarked against Refinitiv Business Classifications to ensure comparability across industries. The ESG score is then adjusted with a controversy score, which captures the frequency and severity of the firm's ESG scandals reported by the media and other external sources. The discounted score is referred to as the ESGC score, ranging from 0 (worst) to 100 (best). The use of ESGC instead of ESG ratings addresses the limitations of ESG ratings studied by Mobius and Ali (2021).

I calculate a firm's change in ESG practice (ESGChange$_{t+1}$) by the percentage change of its ESGC one year after the year of spin-off (t) from ESGC one year prior to the year of spin-off:

$$ESGChange_{t+1} = \frac{ESGC_{t+1} - ESGC_{t-1}}{ESGC_{t-1}}$$

4.3.2.3. Control variables

I employ a set of firm-level control variables, which are most likely to influence a firm's ESG practices. *First*, larger firms are subject to a greater extent of visibility (Delmas & Burbano, 2011) and, consequently, are exposed to greater pressure from external stakeholders to maintain legitimate ESG practices (Bowen, 2000). Thus, I proxy a firm's size (Assets) by employing the natural logarithm of its total assets. *Second*, Barnea and Rubin (2010) show that a high level of leverage minimizes the free cash flow in hand of managers, thereby mitigating the potential of ESG overinvestment. Drempetic et al. (2020) challenge this finding by arguing that a firm that employs more leverage will have more resources to invest in ESG activities, thereby improving its ESG performance.

I additionally control the firm's leverage (Leverage), which is calculated as the ratio of total book value of debt to total book value of assets. *Third,* following Hong et al. (2012), who conclude that a firm's financial slack drives its sustainability practices, I control for the TobinQ ratio and profitability. TobinQ is the market value of equity plus total debt divided by total assets. Profitability is the ratio of net income divided by total equity (ROE). *Fourth,* Dyck et al. (2019) find that the level of institutional ownership impacts the extent of transformation of firms' ESG practices. Fu et al. (2020) find that the heterogeneity among institutional owners drives firms' various adoption of ESG practices. Consequently, I account for the firm's institutional ownership (InstOS) as a control variable. *Fifth,* Nguyen et al. (2022) find that firms improve their ESGC ratings when acquiring targets with better ESG practices, and as a result, I control for a firm's previous M&A experience (MAExp). I define the dummy variable MAExp that assumes the value of 1 if a firm undertakes any M&A deals within three years prior to the year of its spin-off, and 0 otherwise. I obtain all data from Refinitiv. Appendix 4.2 reports the definition and calculation of each variable used in my paper.

4.3.3. *Data statistics*

Table 4.1 presents the sample statistics. The average of SRI ownership (SRIOS$_{t-1}$) one year prior to the firms' spin-offs is 6.3%, with a standard deviation of 0.06. The maximum SRI ownership in firms is 18.7%, while 35% of the sample (78 firms) do not have any SRI ownership before the spin-off. Although the mean value of SRI ownership preceding a spin-off is relatively low, the average institutional ownership (InstOS) is high, at approximately 81%, with a standard deviation of 14.4%. The sample firms are large, with an average asset value of US$5.3 billion. However, the average profitability (ROE) of firms prior to a spin-off is –10% with a standard deviation of 0.828. After the spin-off, sample firms improve their average ESGC rating by 9.25%. Firms also attract on average an additional 18.4% and up to 43.2% in average of SRI ownership one year and two years after the spin-off, respectively.

Table 4.1. Descriptive data.
This table presents the descriptive statistics of the sample including all US spin-offs from 2006 to 2020. Appendix 4.2 provides definitions and measures of all variables.

Variable	Obs.	Mean	Std. dev.	Min	Max
$SRIOS_{t-3}$	221	0.086	0.043	0.000	0.190
$SRIOS_{t-2}$	221	0.095	0.050	0.000	0.200
$SRIOS_{t-1}$	221	0.094	0.048	0.000	0.187
$ESGChange_{t+1}$	221	0.092	0.346	-0.693	1.288
$SRIOSChange_{t+1}$	147	0.184	0.425	-0.731	1.054
$SRIOSChange_{t+2}$	137	0.432	0.482	-0.483	1.718
Assets	221	22.397	2.311	11.473	25.827
Leverage	221	0.747	1.090	0.160	9.703
TobinQ	221	1.872	1.163	0.697	7.607
ROE	221	-0.100	0.828	-6.295	0.210
InstOS	221	0.808	0.144	0.272	1
MAExp	221	0.842	0.366	0	1

4.3.4. Diagnostic tests

I investigate potential multicollinearity issues by examining Pearson's correlations among independent variables. Table 4.2 shows that correlations among independent variables are less than 0.8 and Variance Inflation Factors (VIF) are all less than 10 and suggest that I can rule out the existence of multicollinearity (Mansfield & Helms, 1982).

Table 4.2. Pearson correlations and Variance Inflation Factors.
This table present the correlation matrix among variables and their Variance Inflation Factor (VIF). Appendix 4.2 provides definitions and measures of all variables. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	VIF
(1) $SRIOS_{t-3}$	1												
(2) $SRIOS_{t-2}$	0.915***	1											
(3) $SRIOS_{t-1}$	0.886***	0.961***	1										
(4) $ESGChange_{t+1}$	0.444***	0.546***	0.521***	1									1.37
(5) $SRIOSChange_{t+1}$	0.204**	0.285***	0.252***	0.640***	1								
(6) $SRIOSChange_{t+2}$	0.292***	0.294***	0.254***	0.693***	0.777***	1							
(7) Assets	0.195***	0.167**	0.157**	0.090	-0.046	-0.063	1						1.72
(8) Leverage	-0.145**	-0.144**	-0.147**	-0.022	0.022	-0.061	-0.509***	1					1.64
(9) TobinQ	-0.025	0.021	0.020	0.007	0.061	0.056	-0.449***	0.396***	1				2.01
(10) ROE	0.179***	0.178***	0.180***	0.046	0.110	0.163*	0.695***	-0.689***	-0.364***	1			1.88
(11) InstOS	0.143**	0.149**	0.134**	-0.014	-0.169**	-0.094	0.152**	0.003	0.112*	0.029	1		1.43
(12) MAExp	0.153**	0.128*	0.127*	0.011	0.009	0.015	0.282***	-0.122*	-0.133**	0.144**	0.016	1	1.33

I also perform the Breusch-Pagan (1979) test to check for the presence of heteroskedasticity. Table 4.3 reveals that the *p*-value in all regressions are significant and, therefore, I reject the null hypothesis that the error term has constant variance. To address the problem of heteroskedastic residuals in my estimation models, I use robust standard errors as suggested by White (1980).

Table 4.3. Breusch-Pagan test.
This table presents results of the Breusch-Pagan (1979) test for heteroskedasticity. Appendix 4.2 provides definitions and measures of all variables.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	$ESGChange_{t+1}$	$ESGChange_{t+1}$	$ESGChange_{t+1}$	$SRIOSChange_{t+1}$	$SRIOSChange_{t+1}$
Ind. Var.	$SRIOS_{t-1}$	$SRIOS_{t-2}$	$SRIOS_{t-3}$	$ESGChange_{t+1}$	$ESGChange_{t+1}$
	Breusch-Pagan Test				
	H_0: The error term has a constant variance				
$\chi^2(1)$	11.77	8.11	13.79	4.13	3.36
Prob $> \chi^2$	0.001	0.004	0.002	0.042	0.067

4.4. The impact of SRI ownership on ESG changes following a spin-off

4.4.1. Baseline results

I examine the impact of a firm's SRI ownership pre-spin-off on its ESG performance post-spin-off by the following baseline model:

$$ESGChange_{i,t+1} = \alpha_0 + \alpha_1 SRIOS_{i,t-1} + \alpha_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \quad (4.1)$$

where i is a firm; t is the spin-off year; $Control_{t-1}$ is a set of control variables related to the firm's characteristics, including Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. These control variables are lagged by one year prior to the year of spin-off. γ is the year fixed effect; δ is the industry fixed effect; and ϵ is the error term.

I include year fixed effects to eliminate time-varying unobserved heterogeneity from the error term. Similarly, I account for a firm's industry fixed effect to eliminate invariant unobserved heterogeneity across industries. Rubin (2008) shows that corporate sustainability performance correlates with stakeholders' political beliefs. Firms located in Democratic states tend to have higher sustainability ratings than firms located in Republican states. The associated variation of sustainability practices across states may

be a catalyst for SRI. Therefore, I cluster the standard errors at the state level to account for the possible correlation within states.

I find that firms with higher proportions of SRI ownership prior to spin-offs have a greater improvement in ESG practices. Columns (1), (2), and (3) in Table 4.4 present the regression results estimated by the Ordinary Least Squares (OLS) estimate. Column (1) shows that the coefficient of SRIOS$_{t-1}$ is positive (3.299) and statistically significant (p-value less than 0.01). A one standard deviation increase in the percentage of SRI ownership one year prior to the spin-off is associated with 3.299 percentage points higher ESGC score improvement post-spin-off. That result remains consistent when I employ the firm-quarter sample besides the firm-year one.

Dimson et al. (2015) find that SRI owners influence the behavior of the firms that they invest in approximately one-and-a-half years after initial engagement. Therefore, I further examine the effect of SRI ownership two years and three years before the spin-offs which are reported in columns (2) and (3), respectively. The coefficients of $SRIOS_{t-2}$ and $SRIOS_{t-3}$ are 3.365 and 2.914 at the confidence level of 99%. The result is consistent with Dimson et al. (2015), as a firm's SRIOS two years prior to the spin-off has the strongest influence on its ESG improvement post-spin-off. Therefore, these results support Hypothesis 4.1.

Table 4.4. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off with the OLS estimate.
This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off with the OLS estimate. Column (1) and (2) show the regressions of ESGChange$_{t+1}$ on SRIOS$_{t-1}$ with the firm-year and firm-quarter samples, respectively. Column (3) and (4) present the regression of ESGChange$_{t+1}$ on SRIOS$_{t-2}$, and SRIOS$_{t-3}$, respectively. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	ESGChange$_{t+1}$	ESGChange$_{t+1}$	ESGChange$_{t+1}$	ESGChange$_{t+1}$
SRIOS$_{t-1}$	3.299***	3.804***		
	(5.70)	(5.95)		
SRIOS$_{t-2}$			3.365***	
			(5.95)	
SRIOS$_{t-3}$				2.914***
				(4.16)
Assets	0.022	0.007	0.019	0.019
	(1.64)	(1.36)	(1.56)	(1.47)
Leverage	-0.033	-0.017	-0.031	-0.036
	(-1.00)	(-0.51)	(-0.98)	(-1.07)
TobinQ	-0.003	-0.018	-0.002	0.006
	(-0.14)	(-1.14)	(-0.13)	(0.30)
ROE	-0.099*	-0.057	-0.091*	-0.081
	(-1.74)	(-1.14)	(-1.72)	(-1.52)
InstOS	-0.363**	-0.383**	-0.396**	-0.333*
	(-2.58)	(-2.66)	(-2.75)	(-2.01)
MAExp	-0.037	-0.027	-0.038	-0.027
	(-0.58)	(-0.46)	(-0.58)	(-0.39)
Constant	-0.256	0.085	-0.183	-0.201
	(-0.89)	(0.86)	(-0.64)	(-0.68)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	216	864	216	216
Adj. R^2	0.268	0.338	0.296	0.168

4.4.2. Addressing endogeneity concerns

SRI ownership is a potentially endogenous variable, as firms' superior ESG practices may be the catalyst for attracting SRI fund ownership (Fu et al., 2020; Liang & Vansteenkiste, 2022). I mitigate this concern by employing an instrumental variable and the Two-Stage Least Squares (2SLS) estimate to estimate Equation (4.1). Rubin (2008)

concludes that the variation of ESG practices across states are linked to the political inclination of the state (i.e., Democratic or Republican). The Democratic party is more inclined to incorporate ESG-related considerations into its political platform. As a result, I expect that firms located in Democratic states tend to have better ESG practices than firms situated in Republican states. Previous literature reveals that SRI investors have two distinct strategies of investment: (i) engagement with firms to improve their sustainability performance (Dyck et al., 2019) and (ii) selection of good ESG firms (Heath et al., 2022). Although the influence of SRI holdings on firms' ESG performance is debatable, I predict that SRI holdings are subject to the ESG practices that vary in accordance with the political beliefs of states. Therefore, I argue that the relevance condition is satisfied. In addition, although a state's political view shapes the sustainability practices of firms in that state, such a belief does not determine the firms' ESG improvement post-spin-off rather than the indirect effect via the engagement of SRI shareholders—that is, the exclusion restriction is met. Therefore, I use the political view of the state (Republican) where a firm is located as an instrumental variable. I classify a state as being Republican or Democratic based on its status in relation to the U.S. Presidential Election results at the state level prior to the year of spin-off. If a state has a majority support for the Republican Party, I classify it as a Republican State and ascribe it the value of 1, and 0 otherwise. I retrieve the election results from The New York Times.

Table 4.5 presents the regression results estimated by the 2SLS estimate. Columns (1), (3), and (5) present the first stage regression of $SRIOS_{t-1}$, $SRIOS_{t-2}$, and $SRIOS_{t-3}$ on the instrumental variable, Republican, respectively. The instrumental variable significantly impacts a firm's SRI ownership in a positive manner. In other words, firms located in Democratic states have better ESG practice but lower SRI ownership than ones in Republican states. This finding is in line with the view of SRI investors' engagement. SRI investors engage with low ESG-rated firms to improve their sustainability performance. The F-statistics in these first-stage regressions are higher than 10, so the relevance condition is statistically satisfied (Staiger & Stock, 1997).

The influence of SRI ownership on firms' ESG improvement post-spin-off estimated by the 2SLS estimate is consistent with the OLS method. Columns (2), (4), and (6) in Table 4.5 report the second stage regressions of $ESGChange_{t+1}$ on the predicted value of $SRIOS_{t-1}$, $SRIOS_{t-2}$, and $SRIOS_{t-3}$, respectively, which is obtained from the

corresponding first-stage regressions. The coefficients of $SRIOS_{t-1}$, $SRIOS_{t-2}$, and $SRIOS_{t-3}$ remain positive and statistically significant, with a p-value lower than 0.05.

Table 4.5. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off with the 2SLS estimate.

This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off with the 2SLS estimate. Column (1), (3), (5) are the first stage regressions of $SRIOS_{t-1}$, $SRIOS_{t-2}$, $SRIOS_{t-3}$ on Republican, respectively. Column (2), (4), (6) are the second stages of those corresponding regressions. Republican is recorded 1 if the firm is located in the Republican state, and 0 otherwise. Regarding the US Presidential Election results at the state level prior to the year of spin-off, we classify a state as a Republican or Democratic one. If a state has a majority of votes for Republican Party, we classify it as a Republican State. We retrieve the election results from The New York Times. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	First stage	Second stage	First stage	Second stage	First stage	Second stage
	$SRIOS_{t-1}$	$ESGChange_{t+1}$	$SRIOS_{t-2}$	$ESGChange_{t+1}$	$SRIOS_{t-3}$	$ESGChange_{t+1}$
$SRIOS_{t-1}$		5.499**				
		(2.10)				
$SRIOS_{t-2}$				4.851**		
				(2.27)		
$SRIOS_{t-3}$						5.067**
						(2.13)
Republican	0.022***		0.025***		0.024***	
	(2.99)		(3.23)		(3.74)	
Assets	0.001	0.018	0.002	0.016	0.003	0.012
	(0.69)	(1.36)	(0.95)	(1.33)	(1.49)	(1.18)
Leverage	-0.005	-0.027	-0.006	-0.026	-0.004	-0.031
	(-0.60)	(-0.86)	(-0.64)	(-0.88)	(-0.47)	(-0.99)
TobinQ	0.006	-0.014	0.006	-0.01	0.003	0
	(1.53)	(-0.58)	(1.35)	(-0.45)	(1.04)	(0.01)
ROE	0.008	-0.116**	0.006	-0.099*	0.003	-0.087*
	(0.70)	(-2.05)	(0.44)	(-1.94)	(0.25)	(-1.75)
InstOS	0.042	-0.472**	0.050	-0.482***	0.038	-0.431**
	(1.09)	(-2.40)	(1.46)	(-2.83)	(1.37)	(-2.19)
MAExp	0.020	-0.073	0.021*	-0.063	0.020	-0.06
	(1.62)	(-1.05)	(1.67)	(-0.89)	(1.90)	(-0.82)
Constant	-0.025	-0.08	-0.049	0.019	-0.058	0.079
	(-0.33)	(-0.25)	(-0.77)	(0.07)	(-1.22)	(0.27)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
F statistics	12341		1366		659	
Obs.	221	221	221	221	221	221
R^2	0.257	0.273	0.253	0.353	0.245	0.209

This finding is consistent with the view that SRI funds influence the ESG practices of firms in which they invest in. Dyck et al. (2019), Krueger et al. (2020), and McCahery et al. (2016) show that SRI shareholders improve firms' sustainability behavior via private discussion with managers, proxy voting, or proposals. In addition, Dawkins (2018) contends that SRI owners should undertake engagement in combination with a divestment strategy to address their firms' ESG related issues. Following Dawkins (2018), I additionally examine whether SRI shareholders use a divestment approach to pressure firms to transform their ESG practices. I proxy the divestment of SRI owners by using the change in SRI ownership from two years to one year prior to the spin-off (SRIOSChange$_{t-1}$). I regress ESGChange$_{t+1}$ on SRIOSChange$_{t-1}$ and find that the divestment of SRI owners does not have a significant impact on their firms' ESG improvement. Thus, I can rule out the possibility that SRI owners influence firm behavior via any divestment-related pressures.

Besides the presence of engagement effect discussed above, the selection effect, which is in line with Heath et al. (2022), also exists in the studied sample. I further document that firms in the portfolios of SRI funds prior to spin-offs in my sample have low ESGC scores. The average scores for these firms are 39.53, 36.57, and 32.88 (out of 100) in one year, two years, and three years prior to the spin-offs, respectively. In addition, the sampled firms without SRI ownership prior to the spin-offs have even lower ESGC scores than the group with SRI ownership and such a difference is statistically significant. This indicates that SRI funds are more likely to select firms with higher ESG ratings while still providing room for ESG-related improvements. The SRI funds can then engage with those firms to improve their ESG performance.

4.5. The mechanism on the impact of SRI ownership pre-spin-off on a firm's ESG improvement post-spin-off

Following Dyck et al. (2019) and Dawkins (2018), I examine how SRI shareholders engage firms to improve corporate ESG practice post-spin-offs via an ESG proposal channel. Shareholders, particularly SRI ones, use ESG proposals[18] to raise issues

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[18] Proxy voting enables shareholders to cast votes on important corporate decisions, such as the election of directors, executive compensation, and other matters that may affect a company's ESG performance. Although Dikolli et al (2022) find that proxy voting by the U.S. ESG funds positively influences firms' ESG practices, I do not consider proxy voting as a potential mechanism in our study, as the average proportion of SRI ownership in a firm is relatively small—that is, the voting power is weak.

and concerns regarding corporate ESG policies and practices (Dikolli et al., 2022). The proposals also request firms for specific actions to address such issues. The shareholders typically submit ESG proposals prior to a firm's annual meeting, and the eligible proposals[19] can be included in the company's proxy statement and presented for shareholder votes. Through this mechanism, SRI shareholders help to drive positive change in corporate behavior in sustainability. ESG proposals proposed by SRI shareholders improve a firm's environmental and social practices (Barko et al., 2022; Wei, 2020), governance performance (Dimson et al., 2015), and stock returns (Barko et al., 2022).

Further, I obtain the number of successful ESG proposals made by SRI shareholders from FactSet. *First*, I retrieve all successful ESG proposals with meeting days from January 1, 2003, to December 31, 2020. *Second*, I match the company's name of each proposal to the list of company names in my sample (i.e., using SEDOL identifier) to identify companies in the sample that have ESG proposals within three years prior to the year of divestment. *Third*, I match each proposal's proponent name to the list of SRI funds, which I previously obtain from Morningstar and UNPRI, to determine the ESG proposals made by SRI funds. *Finally*, I calculate the number of successful ESG proposals made by SRI funds in three years ($Proposal_{t-3}$), two years ($Proposal_{t-2}$), and one year ($Proposal_{t-1}$) prior to the year of divestment (t) for each firm.

Following Baron and Kenny (1986a), I investigate the potential mediating role of ESG proposals in the relationship between SRI ownership and a firm's improvement in ESG practices post-spin-off. I perform three regressions, as described below:

$$ESGChange_{i,t+1} = \alpha_0 + \alpha_1 SRIOS_{i,t-1} + \alpha_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \qquad (4.2)$$

$$Proposal_{i,t-1} = \beta_0 + \beta_1 SRIOS_{i,t-1} + \beta_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \qquad (4.3)$$

$$ESGChange_{i,t+1} = \theta_0 + \theta_1 SRIOS_{i,t-1} + \theta_2 Proposal_{i,t-1} + \theta_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \qquad (4.4)$$

where i is a firm; *Proposal* is the number of successful ESG proposals proposed by SRI shareholders in the year prior to the spin-off; α_1, β_1, and θ_2 must be significantly

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[19] These are proposals that meet SEC rules and guidelines.

different from 0 to qualify as a mediator (*Proposal* variable). When controlling $Proposal_{i,t-1}$ in Equation (4.4), if the impact of $SRIOS_{i,t-1}$ on $ESGChange_{i,t+1}$ (θ_1) becomes insignificant, *Proposal* serves as a full mediator. If θ_1 remains significant, *Proposal* functions as a partial mediator. α_1 represents the total effect of $SRIOS_{i,t-1}$ on $ESGChange_{i,t+1}$. θ_1 indicates the direct impact. $\beta_1 * \theta_2$ is the indirect effect—that is, the impact of $SRIOS_{i,t-1}$ on $ESGChange_{i,t+1}$ is explained by $Proposal_{i,t-1}$. I perform the Sobel test (see Sobel (1982) for details) to measure the significance of the indirect effect.

The number of successful ESG proposals proposed by SRI funds (*Proposal*) partially mediates the impact of SRI ownership pre-spin-off on ESG improvement post-spin-off. Panel A in Table 4.6 presents the mediating effect of $Proposal_{t-1}$ on the $SRIOS_{t-1}$ - $ESGChange_{t+1}$ relationship. Columns (1), (2), and (3) report the results of Equation (4.2), Equation (4.3), and Equation (4.4), respectively. Three conditions of a mediator as per Baron and Kenny (1986a) hold. The coefficient of $SRIOS_{t-1}$ in column (1) is 3.299 and significant. It is the total effect of $SRIOS_{t-1}$ on $ESGChange_{t+1}$. With regard to column (2), $SRIOS_{t-1}$ significantly impacts $Proposal_{t-1}$, with the coefficient of 4.767. When controlling for $SRIOS_{t-1}$, $Proposal_{t-1}$ significantly influences $ESGChange_{t+1}$ with the coefficient of 0.26 reported in column (3). The coefficient (2.061) of $SRIOS_{t-1}$ remains statistically significant, thereby confirming the partial mediating effect of $Proposal_{t-1}$ on the $SRIOS_{t-1}$ - $ESGChange_{t+1}$ relationship. The Sobel test reveals that the indirect effect of $SRIOS_{t-1}$ on $ESGChange_{t+1}$, which is explained by $Proposal_{t-1}$, is 1.238 and significant. Such an indirect effect accounts for 37.5% of total direct effect. In other words, 37.5% of the total effect of $SRIOS_{t-1}$ on $ESGChange_{t+1}$ is explained by $Proposal_{t-1}$. $SRIOS_{t-1}$'s direct effect of 2.061 is mediated by other mediators. The indirect effect measured by the Sobel test is a product of two parameters, so the sampling distribution of products and Sobel's z test is not normal. Thus, we additionally perform the bootstrap test of the indirect effect measured by the Sobel test (see Preacher & Hayes (2004) for details). I undertake the bootstrap test with 1,000 bootstrap samples and the confidence level at 95%. The significance level remains after the bootstrap test. It strongly confirms that the number of successful ESG proposals proposed by SRI funds serves as a mechanism on the impact of SRI ownership pre-spin-off and a firm's ESG improvement post-spin-off.

Table 4.6. The mechanism on how SRI funds engage firms in their portfolios to improve their ESG practices.

This table shows the mediating effect of the number of successful ESG proposals in the relationship between $SRIOS_{t-1}$ (Panel A), $SRIOS_{t-2}$ (Panel B) and $SRIOS_{t-3}$ (Panel C) and $ESGCChange_{t+1}$, respectively. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The Sobel test measures the significance of the mediators ($Proposal_{t-1}$, $Proposal_{t-2}$, $Proposal_{t-3}$). The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: one year prior to the year of divestment (t-1)				
	(1)	(2)	(3)	Sobel Test	
	$ESGCChange_{t+1}$	$Proposal_{t-1}$	$ESGCChange_{t+1}$		
$SRIOS_{t-1}$	3.299***	4.767***	2.061***	Indirect effect	1.238***
	(5.63)	(9.58)	(3.12)		(3.94)
$Proposal_{t-1}$			0.26***	Direct effect	2.061***
			(4.32)		(3.12)
Constant	-0.122	-0.064	-0.105	Total effect	3.299***
	(-0.38)	(-0.12)	(-0.35)		(5.63)
Control var.	Yes	Yes	Yes		
Year FE	Yes	Yes	Yes		
Industry FE	Yes	Yes	Yes		
Obs.	221	221	221		
Adj. R^2	0.3825	0.4854	0.458		
	Panel B: Two years prior to the year of divestment (t-2)				
	$ESGCChange_{t+1}$	$Proposal_{t-2}$	$ESGCChange_{t+1}$		
$SRIOS_{t-2}$	3.365***	5.831***	2.082**	Indirect effect	1.283***
	(5.89)	(13.78)	(2.72)		(3.02)
$Proposal_{t-2}$			0.22***	Direct effect	2.082***
			(3.1)		(2.72)
Constant	-0.043	0.151	-0.076	Total effect	3.365***
	(-0.14)	(0.32)	(-0.27)		(5.89)
Control var.	Yes	Yes	Yes		
Year FE	Yes	Yes	Yes		
Industry FE	Yes	Yes	Yes		
Obs.	221	221	221		
Adj. R^2	0.4055	0.5467	0.4577		
	Panel C: Three years prior to the year of divestment (t-3)				
	$ESGCChange_{t+1}$	$Proposal_{t-3}$	$ESGCChange_{t+1}$		
$SRIOS_{t-3}$	2.914***	4.847***	2.293***	Indirect effect	0.621**
	(4.11)	(8.06)	(2.84)		(2.22)
$Proposal_{t-3}$			0.128**	Direct effect	2.293***
			(2.3)		(2.84)
Constant	-0.033	-0.915**	0.085	Total effect	2.914***
	(-0.1)	(-2.21)	(0.24)		(4.12)
Control var.	Yes	Yes	Yes		
Year FE	Yes	Yes	Yes		

Table 4.6. (continued)

Industry FE	Yes	Yes	Yes
Obs.	221	221	221
Adj. R²	0.2976	0.4498	0.3173

I also additionally check the mediating role of the number of successful ESG proposals made by SRI funds in two years ($Proposal_{t-2}$) and three years ($Proposal_{t-3}$) prior to the year of spin-off. Panels B and C report the mediating roles of $Proposal_{t-2}$ and $Proposal_{t-3}$, respectively. The statistics reconfirm that the number of successful ESG proposals proposed by SRI funds serves as a mechanism on the impact of SRI ownership pre-spin-off and a firm's ESG improvement post-spin-off.

Responding to the SRI funds' ESG demand via ESG proposals, firms in their portfolios choose to spin off poorly ESG-rated units as one of resolutions. Firms incorporate an objective of ESG improvement stated in the successful ESG proposals into their strategies. They then shed units that perform poorly in ESG to improve the ESG practices of the parent firms.

4.6. Variation of the SRIOS – ESGChange relationship

4.6.1. Financial constraint

Following Lamont et al. (2001), I measure a firm's financial constraint by constructing the KZ index. Lamont et al. (2001) perform an ordered logit model regarding Kaplan and Zingales (1997)'s classification to five accounting variables,[20] which are derived from an in-depth study of firms. The coefficients estimated from the model are used to construct the KZ index.[21] Compared to other measures of financial constraint,[22] the approach of Lamont et al. (2001) is more prevalent in several studies (Baker et al., 2003; Ehrmann & Fratzscher, 2004) because the coefficient estimates are stable across

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[20] Cash flow, market-to-book, leverage, dividends, and cash holdings

[21] KZ index = -1.002*Cash flow/K + 0.283*TobinQ + 3.139*Debt/Total capital - 39.368* Dividend/K - 1.315*Cash/K, where *Cash flow* = income before extraordinary items + depreciation & amortization. *K* is lagged value of Property, Plant, Equipment. *TobinQ* = (Market capitalization of equity + total debt)/ total assets. *Debt* is total debts. Total capital = Total debts + Total stockholders' equity. *Dividend* is the total dividend payments to common and preferred stockholders. *Cash* is the total cash and short-term investment.

[22] Credit rating (Farre-Mensa & Ljungqvist, 2016), dividend payer status (Fazzari et al., 1988), WW index (Whited & Wu, 2006; Hennessy & Whited, 2007).

samples and over time (Farre-Mensa & Ljungqvist, 2016). Firms are more financially constrained when their KZ index value is higher. I calculate firms' KZ index at the end of three, two, and one year(s) prior to their spin-offs. I divide the sample into two groups: high and low financial constraints. I classify a firm as a high constraint one (HighConstraint) when its KZ index value is equal to or larger than the sample's median of the KZ index value and as a low constraint one otherwise (LowConstraint).

I find that the influence of a firm's SRI ownership pre-spin-off on its ESG improvement post-spin-off is more pronounced when the extent of financial constraint pre-spin-off is higher. Columns (1) and (2) in Table 4.7 present the $SRIOS_{t-1}$ – $ESGChange_{t+1}$ relationship in the high and low financial constraint groups, respectively. The coefficients of $SRIOS_{t-1}$ are 3.312 and 2.712 in the high and low groups of financial constraint, respectively, in a statistically significant manner (p-value less than 0.01). According to the Chi Square test, the coefficient of $SRIOS_{t-1}$ in the high constraint group is statistically different from that in the low constraint one with p-value less than 0.05.[23] The result remains consistent for the SRIOS two years[24] (reported in columns (3) and (4)) and three years[25] (reported in columns (5) and (6)) pre-spin-offs. The finding is consistent with the prediction that SRI owners are more likely to engage with firms that experience a funding shortage. Thus, my evidence supports Hypothesis 4.2.

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[23] The Chi Square Test of the coefficients of $SRIOS_{t-1}$ in the high constraint and low constraint groups: $\chi^2(1) = 4.01$, p-value = 0.045
[24] The Chi Square Test of the coefficients of $SRIOS_{t-2}$ in the high constraint and low constraint groups: $\chi^2(1) = 3.86$, p-value = 0.049
[25] The Chi Square Test of the coefficients of $SRIOS_{t-3}$ in the high constraint and low constraint groups: $\chi^2(1) = 4.90$, p-value = 0.027

Table 4.7. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding its level of financial constraint pre-spin-off.

This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding a firm's level of financial constraint. Following Lamont et al. (2001), we employ the KZ index to measure a firm's level of financial constraint. We classify a firm as a high constraint one (High Constraint) when its KZ index value is equal or larger than the sample's median of KZ index value and a low constraint one otherwise (Low Constraint). Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	High Constraint	Low Constraint	High Constraint	Low Constraint	High Constraint	Low Constraint
	ESGChange $_{t+1}$	ESGChange $_{t+1}$	ESGChange $_{t+1}$	ESGChange $_{t+1}$	ESGChange $_{t+1}$	ESGChange $_{t+1}$
$SRIOS_{t-1}$	3.312***	2.712***				
	(3.43)	(3.03)				
$SRIOS_{t-2}$			3.337***	2.964***		
			(3.43)	(3.60)		
$SRIOS_{t-3}$					3.213***	2.069*
					(3.56)	(1.94)
Assets	0.012	0.007	0.007	0.009	-0.017	0.026
	(0.42)	(0.52)	(0.28)	(0.71)	(-0.63)	(1.59)
Leverage	-0.048	0.053*	-0.044	0.053*	0.062	-0.016
	(-0.91)	(1.86)	(-0.91)	(2.03)	(0.63)	(-0.39)
TobinQ	-0.114	0.031**	-0.109	0.029**	-0.065	0.054***
	(-1.62)	(2.45)	(-1.66)	(2.68)	(-1.31)	(3.20)
ROE	-0.207**	0.012	-0.188**	0.01	0.078	-0.097*
	(-2.08)	(0.23)	(-2.16)	(0.21)	(0.45)	(-1.79)
InstOS	-0.273	-0.235	-0.347	-0.255	-0.204	-0.298
	(-1.08)	(-1.15)	(-1.31)	(-1.45)	(-0.71)	(-1.29)
MAExp	-0.155	0.047	-0.172	0.05	-0.201	0.007
	(-1.22)	(0.55)	(-1.42)	(0.55)	(-1.32)	(0.07)
Constant	0.155	-0.194	0.328	-0.226	0.701	-0.489
	(0.22)	(-0.73)	(0.50)	(-0.94)	(1.15)	(-1.69)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	109	106	109	106	106	107
Adj. R^2	0.334	0.215	0.34	0.283	0.36	0.066

The engagement of SRI owners to improve their firms' ESG practices after the spin-offs is a viable strategy to deal with the issue of funding shortage. Firms' ESG improvement post-spin-offs with the involvement of SRI owners lowers their information

asymmetry, which helps them reduce their cost of equity to access the capital market easier (Cheng et al., 2014; Hennessy & Whited, 2007). This is also consistent with Kaplan and Zingales (1997), who show that financial constraints drives corporate strategies.

However, such a view may raise a concern of whether the financial constraint as a stand-alone factor motivates firms to transform their ESG practices without the engagement of SRI owners. To investigate this, I additionally regress ESGChange$_{t+1}$ on the extent of financial constraint pre-spin-off and find that a firm's extent of financial constraint pre-spin-off has no significant impact on its ESG improvement post-spin-off. Thus, I conclude that firms with no engagement of SRI shareholders may prefer other approaches to raise more capital instead of improving their ESG practices, which require substantial expenses (Barnea & Rubin, 2010). On the other hand, SRI owners' engagement via the firm's spin-off motivates it to incorporate ESG improvement into the deal's objectives. Such an engagement motivates the firm to spin off its poor ESG units, thereby improving its ESG performance. Further testing reveals that the mean of ESGChange$_{t+1}$ in the group without SRI ownership pre-spin-offs is negative (-3%). In addition, the mean of ESG improvement in the group with SRI ownership pre-spin-offs is 15%, which is significantly higher than that in the group without SRI ownership.[26] This finding supports my argument that the involvement of SRI owners is a catalyst for ESG improvements via spin-offs.

4.6.2.   *ESG performance pre-spin-offs*

I base my methodology on Heath et al. (2022) to examine the influence of SRI owners on firms' sustainability practices across different levels of firms' ESG performance pre-spin-off. Heath et al. (2022) argue that SRI investors do not improve the ESG behavior of firms in their portfolios, as the cost of engaging is higher than that of selecting firms that already follow good ESG practices. I predict that when firms have more scope to transform their ESG practices, SRI investors can obtain greater additional benefits that offset the cost of engagement. To investigate this, I divide the sample into two groups: high and low ESGC ratings pre-spin-offs. If a firm's ESGC pre-spin-off is equal or higher than the sample's median of ESGC, I classify it as a high level of ESGC

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[26] With regard to the t-test, the means of ESGChange$_{t+1}$ are 0.15 and -0.03 in the groups with and without SRI ownership pre-spin-offs. The difference in the means between two groups is statistically significant.

(HighESG) and ascribe it the value of 1, and 0 otherwise.

I find that the impact of SRI ownership pre-spin-offs on ESG improvement post-spin-offs is stronger in the low-ESGC firms than in high-ESGC ones. Column (1) in Table 4.8 shows that the coefficient of $SRIOS_{t-1}$ in the high ESGC group is 1.704 lower than that in the low ESGC group, which is 3.808. Both coefficients are statistically significant at the confidence level of 99%. The coefficient of $SRIOS_{t-1}$ in the low ESGC group is statistically significantly different from that in the high ESGC one with p-value less than 0.05.[27] That finding is robust when I further examine the impact of SRIOS in two years[28] (presented in column (3) and (4)) and three years[29] (presented in column (5) and (6)) prior to the spin-offs. Therefore, these results support Hypothesis 4.3.

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[27] The Chi Square test of the coefficients of $SRIOS_{t-1}$ in the low and high ESGC groups: $\chi^2(1) = 6.02$, p-value = 0.014

[28] The Chi Square test of the coefficients of $SRIOS_{t-2}$ in the low and high ESGC groups: $\chi^2(1) = 5.45$, p-value = 0.020

[29] The Chi Square test of the coefficients of $SRIOS_{t-3}$ in the low and high ESGC groups: $\chi^2(1) = 2.90$, p-value = 0.088

Table 4.8. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding its level of ESGC ratings pre-spin-offs.

This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding a firm's ESGC scores pre-spin-offs. If a firm's ESGC score pre-spin-off is equal or higher than the sample's median of ESGC, we classify as a high level of ESGC (High ESG) and a low level otherwise (Low ESG). Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	High ESG	Low ESG	High ESG	Low ESG	High ESG	Low ESG
	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$
$SRIOS_{t-1}$	1.704***	3.808***				
	(3.34)	(4.11)				
$SRIOS_{t-2}$			2.074***	3.715***		
			(3.81)	(3.82)		
$SRIOS_{t-3}$					1.834**	3.328***
					(2.18)	(3.07)
Assets	-0.009	0.064*	0.002	0.048	0.014	-0.001
	(-0.43)	(1.71)	(0.07)	(1.06)	(0.56)	(-0.02)
Leverage	0.074	-0.022	-0.113	-0.01	-0.073	-0.022
	(0.75)	(-0.43)	(-1.39)	(-0.16)	(-0.56)	(-0.41)
TobinQ	0.012	-0.014	0.055**	-0.033	0.051*	-0.045
	(0.41)	(-0.37)	(2.71)	(-0.99)	(1.96)	(-0.99)
ROE	0.142	-0.165	-0.104	-0.113	-0.032	-0.076
	(0.87)	(-1.62)	(-0.79)	(-0.97)	(-0.16)	(-0.72)
InstOS	-0.186	-0.404	-0.064	-0.374	-0.158	-0.043
	(-1.02)	(-1.41)	(-0.38)	(-1.42)	(-0.74)	(-0.14)
MAExp	0.038	0.02	0.127	-0.123	0.052	-0.051
	(0.36)	(0.24)	(1.04)	(-1.07)	(0.33)	(-0.58)
Constant	0.162	-1.13	-0.198	-0.693	-0.299	0.102
	(0.46)	(-1.44)	(-0.36)	(-0.72)	(-0.56)	(0.12)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	103	106	111	98	118	92
Adj. R^2	0.174	0.433	0.233	0.402	0.159	0.196

I conclude that the marginal benefit is greater when the ESG improvement is more significant. When firms have more scope for improvement of their ESG practices, SRI investors have more incentives to engage in firms' strategies. Such significant improvement results in several benefits, such as an improved reputation (Branco &

Rodrigues, 2006), lower cost of capital (Amel-Zadeh & Serafeim, 2018; Fatemi et al., 2015), and stronger stakeholders' commitment (Arouri et al., 2019; Deng et al., 2013). In other words, the engagement of SRI owners is subject to the firms' ESG performance pre-spin-off, which determines the extent of possible improvement and the marginal benefits.

4.6.3. ESG-sensitive industries

Based on the study by Qureshi et al. (2020), I divide my sample into two groups: ESG sensitive and ESG non-sensitive industries. ESG sensitive industries include manufacturing, construction, transportation and warehousing, mining, quarrying, oil and gas extraction, and administrative and waste management sectors. Firms that operate in ESG-sensitive industries tend to be exposed to greater public attention (i.e., higher visibility), thereby encouraging firms to account for ESG practices in their strategies.

I find that the SRIOS–ESGC relationship is more pronounced in ESG-sensitive industries than in the non-sensitive ones. The coefficient of $SRIOS_{t-1}$ in the sensitive industry group reported in Column (1) of Table 4.9 is 3.740 statistically significantly higher than the coefficient of 2.782 in the non-sensitive group presented in Column (2) with p-value less than 0.05.[30] The trend remains consistent when substituting $SRIOS_{t-1}$ by $SRIOS_{t-2}$[31] and $SRIOS_{t-3}$.[32] Thus, this finding supports Hypothesis 4.4.

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[30] The Chi Square test of the coefficients of $SRIOS_{t-1}$ in the ESG sensitive and non-sensitive groups: $\chi^2(1) = 4.69$, p-value = 0.030
[31] The Chi Square test of the coefficients of $SRIOS_{t-2}$ in the low and high ESGC groups: $\chi^2(1) = 4.37$, p-value = 0.037
[32] The Chi Square test of the coefficients of $SRIOS_{t-3}$ in the low and high ESGC groups: $\chi^2(1) = 5.85$, p-value = 0.016

Table 4.9. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding its industry.

This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off regarding a firm's industry. Following Qureshi et al. (2020), we divide the sample into two groups: ESG sensitive and ESG non-sensitive industries. The ESG sensitive industries consist of manufacturing, construction, transportation and warehousing, mining, quarrying, oil and gas extraction and administrative, waste management sectors. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Sensitivity	No Sensitivity	Sensitivity	No Sensitivity	Sensitivity	No Sensitivity
	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$
$SRIOS_{t-1}$	3.740***	2.782***				
	(5.02)	(4.02)				
$SRIOS_{t-2}$			3.685***	2.954***		
			(5.05)	(4.26)		
$SRIOS_{t-3}$					3.745***	2.250***
					(4.29)	(3.46)
Assets	-0.001	0.074**	0	0.062**	-0.003	0.074**
	(-0.05)	(2.77)	(0.01)	(2.46)	(-0.20)	(2.60)
Leverage	0.111*	-0.140**	0.121*	-0.136**	0.114*	-0.152**
	(1.77)	(-2.42)	(2.05)	(-2.41)	(1.89)	(-2.56)
TobinQ	-0.013	0.041	-0.011	0.034	-0.014	0.077*
	(-0.80)	(1.10)	(-0.73)	(0.97)	(-0.85)	(1.79)
ROE	0.148	-0.310**	0.164	-0.286**	0.165	-0.299**
	(1.35)	(-2.67)	(1.61)	(-2.59)	(1.60)	(-2.46)
InstOS	-0.450**	-0.389	-0.457**	-0.409	-0.340*	-0.486
	(-2.24)	(-1.50)	(-2.31)	(-1.53)	(-1.75)	(-1.63)
MAExp	-0.065	-0.046	-0.072	-0.037	-0.069	-0.03
	(-0.89)	(-0.36)	(-1.02)	(-0.28)	(-1.02)	(-0.23)
Constant	0.254	-1.393***	0.233	-1.121**	0.243	-1.327**
	(0.76)	(-2.80)	(0.76)	(-2.26)	(0.74)	(-2.49)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	107	107	107	107	107	107
Adj. R^2	0.317	0.277	0.334	0.312	0.27	0.179

Firms that are subject to higher visibility may pay more attention to ESG issues due to public concerns (Bowen, 2000). The firms' ESG reference most likely enlarges the

engagement effect of SRI owners, who are ESG-oriented, via spin-offs. Firm managers may be willing to cooperate more with SRI owners to transform their ESG practices. In other words, operating in the high ESG sensitive industries may align the ESG interest between firm management and SRI owners.

4.6.4. Time trend analysis

US SIF (2020) reports that the value of SRI AUM accelerated from 1995 to 2020, especially after 2012. I investigate how the influence of SRI owners on changing the sustainability practices of firms in their portfolios varies after 2012. I re-examine Equation (4.1) across two groups in my sample: deals before (inclusive) and after 2012. Columns (1), (3), and (5) in Table 4.10 present the regressions of $ESGChange_{t+1}$ on $SRIOS_{t-1}$, $SRIOS_{t-2}$, and $SRIOS_{t-3}$, respectively, for all spin-offs from 2012 backwards. Columns (2), (4), and (6) in Table 4.10 show the regressions for all deals after 2012. The statistics indicate that the influence of SRI owners on the firm's ESG improvement is significantly stronger among the spin-offs prior to 2012 compared to deals after 2012. For instance, the coefficients of SRI ownership one year prior to the spin-off are 4.354 for the group before 2012 and 2.611 for the group after 2012.

Table 4.10. The impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off before and after 2012.
This table reports the impact of SRI ownership pre-spin-off on a firm's ESG performance post-spin-off before and after 2012. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) Before 2012	(2) After 2012	(3) Before 2012	(4) After 2012	(5) Before 2012	(6) After 2012
	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$	ESGChange $t+1$
$SRIOS_{t-1}$	4.354***	2.611***				
	(4.04)	(3.66)				
$SRIOS_{t-2}$			4.352***	2.629***		
			(4.01)	(3.64)		
$SRIOS_{t-3}$					4.168***	1.801**
					(3.16)	(2.18)
Assets	-0.007	0.026	-0.003	0.025	0.003	0.019
	(-0.13)	(1.28)	(-0.07)	(1.29)	(0.06)	(0.95)
Leverage	-0.022	-0.031	-0.013	-0.027	-0.031	-0.02
	(-0.15)	(-0.94)	(-0.10)	(-0.78)	(-0.23)	(-0.55)
TobinQ	-0.019	0.013	-0.01	0.011	-0.008	0.025
	(-0.42)	(0.53)	(-0.26)	(0.52)	(-0.17)	(0.96)
ROE	-0.074	-0.073	-0.068	-0.067	-0.095	-0.022
	(-0.27)	(-0.93)	(-0.28)	(-0.87)	(-0.36)	(-0.26)
InstOS	-0.447	-0.326*	-0.131	-0.358**	-0.212	-0.281
	(-0.66)	(-2.01)	(-0.22)	(-2.17)	(-0.31)	(-1.54)
MAExp	0.039	-0.031	0.048	-0.037	0.041	-0.017
	(0.36)	(-0.32)	(0.43)	(-0.39)	(0.35)	(-0.17)
Constant	0.389	-0.396	0.033	-0.336	-0.014	-0.256
	(0.26)	(-1.07)	(0.02)	(-0.95)	(-0.01)	(-0.70)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	80	135	80	135	80	135
Adj. R^2	0.358	0.157	0.4	0.162	0.315	0.013

It is evident that the value of SRI investment after 2012 has increased significantly but the influence of SRI investors on changing firms' sustainability behavior is less pronounced. One possible explanation for this is that selecting firms that already exhibit good ESG performance is more common after 2012. Related to this is the potential of greenwashing of SRI investments by SRI funds. Funds may label themselves as SRI funds

without (or less) incorporating ESG factors into their investment decisions. This, in turn, may lead to the weaker influence of SRI investors on ESG practices of firms in their portfolios. The U.S. Securities and Exchange Commission deals with this potential issue by prescribing rules on how SRI funds are marketed. The rules also focus on the required disclosure of how funds account for ESG issues in their investment decision and how they vote at firms' annual meetings (Temple-West & Palma, 2022). My finding suggests an avenue for further research to investigate this issue in the SRI field.

4.7.   The outcome of a spin-off driven by SRI shareholders

I examine whether the ESG improvement post-spin-offs help firms attract more SRI capital by estimating the following model:

$$SRIOSChange_{i,t+1} = \alpha_0 + \alpha_1 ESGChange_{i,t+1} + \alpha_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \quad (4.5)$$

where i is a firm; t is the year of its spin-off; SRIOSChange$_{t+1}$ is the percentage change between SRIOS one year after the spin-off and SRIOS one year prior to the spin-off; $\sum Control_{t-1}$ is a set of control variables related to the firm's characteristics, including Assets, Leverage, TobinQ, ROE, InstOS, and MAExp (these control variables are lagged by one year prior to the year of spin-off); γ is the year fixed effect; δ is the industry fixed effect; and ϵ is the error term. I cluster the standard error at the firm's state level to account for possible correlation within states.

Further, I show that an increase in SRIOS follows ESG improvement post-spin-off. Column (1) in Table 4.11 shows that the coefficient of ESGChange$_{t+1}$ is positive (0.743) at a significance level lower than 0.01. In other words, a one unit increase in ESG rating post-spin-offs results in 0.743 percentage points higher the percentage change between SRIOS one year before and one year after the spin-offs. ESGChange$_{t+1}$ and other control variables could explain 47.2% variation of SRIOSChange$_{t+1}$. Column (2) in Table 4.11 confirms that the SRIOS two years after the deals continues to increase due to such an ESG improvement. The coefficient of ESGChange$_{t+1}$ is 0.913 and statistically significant (p-value less than 0.01). This finding supports Hypothesis 4.5.

Table 4.11. Outcome of Spin-offs driven by SRIOS.
This table reports the impact of a firm's ESG improvement post-spin-off on its change in SRI ownership. Column (1) and (2) show regressions of SRIOSChange$_{t+1}$ and SRIOSChange$_{t+2}$ on ESGChange$_{t+1}$, respectively. Column (3) and (4) exhibit regressions of Inclusion$_{t+1}$ and Inclusion$_{t+2}$ on ESGChange$_{t+1}$, respectively. Control variables include Assets, Leverage, TobinQ, ROE, InstOS, and MAExp. Appendix 4.2 provides definitions and measures of all variables. The models include the year and industry fixed effects. t- and z-statistics reported in parentheses are calculated using standard errors adjusted for heteroskedasticity and state-level clustering. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
	SRIOSChange$_{t+1}$	SRIOSChange$_{t+2}$	Inclusion$_{t+1}$	Inclusion$_{t+2}$
ESGChange$_{t+1}$	0.743***	0.913***	2.760***	2.429***
	(8.17)	(7.40)	(3.82)	(3.37)
Assets	-0.021	-0.052*	0.304**	0.296**
	(-0.89)	(-1.75)	(2.20)	(2.18)
Leverage	-0.12	-0.288**	-1.338	-1.352
	(-0.62)	(-2.09)	(-1.60)	(-1.62)
TobinQ	-0.01	-0.065	0.104	0.098
	(-0.30)	(-1.48)	(0.66)	(0.66)
ROE	0.288	0.888	-0.702	-0.707
	(0.85)	(0.92)	(-0.54)	(-0.55)
InstOS	-0.624***	-0.551***	0.632	0.651
	(-3.46)	(-2.83)	(0.67)	(0.69)
MAExp	0.023	0.092	0.535	0.497
	(0.32)	(0.80)	(1.43)	(1.30)
Constant	1.120**	2.114***	-6.058**	-5.883**
	(2.08)	(3.24)	(-2.15)	(-2.12)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Obs.	143	133	221	221
Adj. R^2	0.472	0.556		
Pseudo R^2			0.171	0.155

SRI investors may seek firms with profitability besides the good ESG performance (Schueth, 2003). I additionally examine whether such an increase in SRI ownership post-spin-offs is driven by the firms' ESG improvement or their enhancement in profitability. I calculate the firms' change in Return-On-Equity (ROE), an indicator of corporate profitability, one-year after the spin-offs compared with the ROE one-year before the spin-offs. I then categorize firms in the sample into two groups: increase in ROE (the change in ROE is larger than or equal to 0) and decrease in ROE (the change in ROE is less than 0). According to the ttest analysis, the mean of ESGChange$_{t+1}$ of the former and the latter are 0.120 and 0.049, respectively. They are statistically different (p-value less than 0.01). In addition, the mean of the SRIOSChange$_{t+1}$ of the former and the

latter are 0.233 and 0.106, respectively. Their difference is statistically significant (p-value less than 0.05). The statistics confirm that the increase in SRI ownership post-spin-offs is driven by the firms' improvement in ESG practices, but not their profitability.

For firms that do not have SRIOS prior to spin-off, I am unable to calculate the percentage change in SRIOS pre- and post-spin-off. Thus, I create a new dummy variable to measure a change in SRIOS. The variable (Inclusion) defines whether a firm attracts new investment from SRI funds, which had not invested in the firm before its spin-off. I record it the value of 1 if a firm has new post-spin-off-investment from SRI funds, which had not invested in the firm prior to its spin-off, and 0 otherwise. I perform the following logistic regression model:

$$Inclusion_{i,t+1} = \alpha_0 + \alpha_1 ESGChange_{i,t+1} + \alpha_2 \sum Control_{i,t-1} + \gamma + \delta + \epsilon \qquad (6)$$

Columns (3) and (4) in Table 4.11 exhibit how the improvement in ESG post-spin-off is associated with the probability of attracting new investment from SRI funds, which had not invested in the firm prior to its spin-off, in one year and two years post-spin-off, respectively. In Column (1), the coefficient of $ESGChange_{t+1}$ is 2.76. A one unit increase in ESGC ratings results in 2.760 increase in log-odds of attracting new investment from SRI funds, which had not invested in the firm prior to its spin-off. In other words, the odds ratio[33] increases by 15.7 times. The finding remains consistent when examining the new SRI investment two years after the spin-offs. Therefore, the findings support Hypothesis 4.6.

Further, the findings are in line with the previous literature on the benefits of ESG practices. Better ESG performance enables easier access to capital markets (Cheng et al., 2014) by reducing information asymmetry (Benlemlih & Bitar, 2018; Cui et al., 2018) and the cost of capital (Amel-Zadeh & Serafeim, 2018; Fatemi et al., 2015). The transformation in ESG practices attracts more institutional shareholders, including SRI funds (Dimson et al., 2015; Fu et al., 2020; Liang & Vansteenkiste, 2022).

4.8. Conclusion

My study reveals that the selection effect exists in the pre-spin-offs and then firm

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[33] Odds ratio $= \dfrac{Probability\ of\ attracting\ new\ SRI\ investment}{1 - Probability\ of\ attracting\ new\ SRI\ investment}$

managers could utilize spin-offs with the engagement of SRI owners as a viable strategy for addressing both stakeholders' ESG demands and attracting additional capital. Higher SRI ownership pre-spin-off is associated with an improved ESG rating post-spin-off, which results in an increase in SRI ownership and the participation of new SRI funds. In addition, my results support the view that SRI investors change the ESG behavior of firms in their portfolio (Dyck et al., 2019). My study confirms that the engagement of SRI owners via ESG proposals ultimately transforms the ESG practices of firms in their portfolios. Specifically, SRI funds engage firms in their portfolios via ESG proposals, which in turn pressures firms to incorporate ESG-related objectives into their strategies. Consequently, firms then spin off poorly rated ESG units to improve the parent firms' ESG practices. The exact influence of SRI funds varies across the firms' extent of financial constraint, current ESG practices, and industries (ESG sensitive or not). Finally, spin-offs with higher SRI ownership tend to signal potential ESG improvement, so investors, especially SRI ones, should incorporate that signal into their investment decision-making process.

My findings suggest an avenue for further research. The value of SRI AUM in the U.S. has increased exponentially over the last decade and this raises questions regarding whether these SRI funds are genuinely socially responsible or if they simply label themselves as SRI to attract investment capital. Future research on this issue will improve understanding on whether SRI funds make an actual impact on changing the ESG behavior of firms in their portfolios.

Appendix 4.1. Sample distribution by announcement year

This appendix describes the number of spin-offs across years. The first column reports the total number of US spin-offs. The second column shows the number of spin-offs whose parent firms are located in the Republican state (Red state). Following Rubin (2008), Republican and Democratic States are determined regarding the US Presidential election results prior to the year of spin-off announcement. If a state has a majority of votes for Republican Party, it is classified as Republican State. We retrieve the election results from The New York Times. The second column shows the number of spin-offs in the ESG sensitive industries. The ESG sensitive industries are determined by following Qureshi et al. (2020). They include manufacturing, construction, transportation and warehousing, mining, quarrying, oil and gas extraction and administrative, waste management sectors.

Year	No. spin-offs	Republican State	ESG Sensitive Industries
2006	22	10	12
2007	27	10	15
2008	2	0	1
2009	0	0	0
2010	1	0	1
2011	16	5	9
2012	15	8	5
2013	20	12	10
2014	35	15	19
2015	19	8	9
2016	11	5	4
2017	14	10	5
2018	18	10	10
2019	8	3	3
2020	13	7	8
Total	**221**	**103**	**111**

Appendix 4.2. Variable measures

This appendix describes the abbreviations and measures of all variables in the study.

Variable	Abbreviation	Measure
SRI ownership	SRIOS	The proportion of a firm's ownership held by SRI funds
The change in SRI ownership	SRIOSChange	The percentage change between SRIOS one year before and one year after the spin-off $(SRIOSChange_{t+1})$. We also calculate $SRIOSChange_{t+2}$ as the percentage change between SRIOS one year before and two years after the spin-off.
New SRI fund(s) participation	Inclusion	1 if new SRI fund(s) participate(s) to a firm's ownership after its spin-off and 0 otherwise.
The change in ESG performance	ESGChange	The percentage change in ESG Combined (ESGC) of a firm between one year before and one year after the spin-off.
Total assets	Assets	Natural logarithm of a firm's total assets at the end of the year prior to the spin-off.
Leverage	Leverage	The ratio between total book value of debts to total book value of assets
TobinQ ratio	TobinQ	The ratio between total market value of equity plus total book value of debts and total book value of the assets.
Return-on-equity	ROE	The ratio between net income and total equity
Institutional ownership	InstOS	The proportion of a firm's institutional ownership
Previous M&A experience	MAExp	1 if a firm undertakes any M&A deals within 3 years prior to the spin-offs and 0 otherwise.

Chapter 5

Conclusion

5.1. Thesis summary

This thesis empirically explores alternative strategies that transform a firm's ESG practices instead of self-investing in ESG, which may lead to an issue of ESG overinvestment. Particularly, the alternative strategies provide firms with mechanisms to either acquire better ESG resources and practices or sharpen their existing ESG policies. Drawing from the organizational learning hypothesis, resource dependence theory, and stakeholder-focused theory, I examine two forms of corporate restructuring—M&As and spin-offs—as potential channels for improvement in ESG performance.

5.1.1. Improvement in Sustainability: Evidence from the M&A Market

The first study documents a positive relationship between a target's relative ESG rating pre-merger and an acquirer's ESG improvement post-merger. Among the three components of an ESG rating, acquirers' environmental rating displays the largest increase. In addition, acquiring targets across borders and in the same industry maximizes acquirers' ESG improvement post-merger. I also find that acquirers pay higher bid premiums to target firms with higher relative ESG ratings and improve acquirers' financial performance post-merger, creating additional value for shareholders. This study suggests that acquiring a better ESG target to transform a firm's ESG practices serves as a viable strategy.

5.1.2. Trust Me, I'm Going Green: Greenwashing Through M&As

The second study investigates whether firms acquire green M&A targets as a form of greenwashing with the intention to mislead the market. I propose a novel measure of greenwashing by using ESG controversies scores. I find that acquirers who engage in higher levels of greenwashing pre-merger tend to acquire targets with higher relative ESG

ratings, and these deals are associated with lower announcement-period returns. I also find evidence of a decrease in the acquirers' extent of greenwashing post-merger. These findings suggest that, although the market may initially be skeptical of such deals, acquirers eventually adopt more sustainable practices and make a sincere effort to "go green". Although M&As can assist a firm in its transition toward being more sustainable, they cannot effectively be used as a shortcut to greenwash, as it takes time to improve its reputation caused by prior bad behavior.

5.1.3. *SRI Fund Ownership and ESG Performance: Evidence from U.S. Spin-offs*

The third study investigates whether a firm transforms its ESG performance via another corporate restructuring activity—spin-offs. I provide evidence that a firm's SRI fund ownership pre-spin-off positively impacts its ESG performance post-spin-off. The ESG proposals proposed by SRI funds function as a mechanism to facilitate such spin-offs. I also find that the relationship between SRI fund ownership pre-spin-off and corporate ESG performance post-spin-off is more pronounced when a firm faces larger financial constraints, has a lower ESG Combined (ESGC) score pre-spin-off, and operates in an ESG-sensitive industry. Following ESG improvements post-spin-off, a firm's SRI fund ownership significantly increases. These findings are significant, as they indicate that spin-offs can be used as a strategy to both improve ESG performance and attract more SRI capital.

5.2. Future Research

The thesis suggests several directions for further research. First, Bauer and Matzler (2014) show that strategic similarity and complementarity have an impact on the integration speed and success of M&As. It will be interesting to explore whether the similarity and complementarity in ESG practices of acquirers and targets pre-merger drives the process of learning and acquiring the ESG practices and experience of target firms. Second, the value of SRI AUM in the U.S. has increased significantly over the last several years. This raises the question of whether these SRI funds are socially responsible, or if they merely label themselves as SRI to attract more capital. Further research could explore this issue. The findings will expand the understanding of whether SRI funds have an actual impact on changing the behavior of firms that are part of the portfolios of such funds.

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