Universität Hamburg

Doctoral Thesis

Sustainability in Finance — Real Effects and Capital Market Consequences

A thesis submitted in fulfillment of the requirements for the degree of
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by

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born in Hanover

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To my parents

Contents

Chapter 1

Synopsis

1.1 Background

In recent years, organizations such as the World Economic Forum (WEF) have identified various sustainability-related risks as some of the most urgent and pressing that the world is currently facing, with climate change being the most prominent example (WEF, 2021, 2022). Given the vast sums of capital needed to pursue the multinational sustainability goals aimed at attenuating these risks, institutional investors are under pressure to adapt their investment portfolios (OECD, 2022). Hence, sustainability, frequently going by the term 'environmental, social, and governance' (ESG), is of increasing importance for society, firms, and investors. As a consequence, various ESG initiatives have emerged in recent years led by central banks (NGFS, 2022), and multilateral organizations (UN PRI, 2022) as well as investors (IIGCC, 2023). These include the introduction of new asset classes such as green bonds (Flammer et al., 2019), reporting frameworks (i.e., the Global Reporting Initiative and the Sustainability Accounting Standards Board), and are also reflected in ongoing regulation on non-financial reporting, especially within the European Union (Fiechter et al., 2022). Similarly, the attention of scientific research in accounting and finance has also shifted towards sustainability.

While the first studies on the social responsibilities of enterprises were skeptical regarding the value of ESG activities (e.g., Friedman, 1970), later ones have found that companies pursuing ESG objectives can generate moral capital from stakeholders and thus benefit from engaging in ESG. For example, strong ESG performance provides a shielding effect in the case of corporate misconduct and other negative events (Christensen, 2016; Godfrey et al., 2009). Moreover, an increasing amount of literature, such as the studies by McWilliams and Siegel (2001), Deng et al. (2013), and Friede et al. (2015), underlines the value of pursuing sustainability-related actions for profit-maximizing companies and investors. Overall, there is ample evidence that the pursuit of ESG objectives can have direct implications for firms' financial performance.

With this increasing interest of academia and practitioners, the topic of sustainable finance has also received intensive scrutiny. For example, some capital market participants have been accused of greenwashing, referring to claims which make a company or investor appear sustainably-oriented without them actually following through (S. Kim & Yoon, 2022). Furthermore, recent studies show that the data which is frequently used to assess companies' ESG performance varies substantially across rating providers (Berg et al., 2022; Busch et al., 2022; Dimson et al., 2020). This indicates that there is no single truth as to which actions foster sustainability (Christensen et al., 2022) or how to adequately measure these actions in the first place (Berg et al., 2022). As a consequence, some scholars

have called for the analysis of specific sub-categories of ESG rather than examining it as a combined measure (Berg et al., 2022; Edmans, 2023). This dissertation aims to follow up on this recommendation by analyzing distinct emerging environmental and social topics (i.e., the first two pillars of ESG) and whether they influence capital market outcomes.

1.2   Research Objective

This dissertation explores two research questions. It contributes to the literature dealing with the importance of environmental and social issues for institutional investors and analyzes how they are, on the one hand, affected by changes in the sustainability efforts of their portfolio companies and, on the other, how institutional investors can themselves induce such changes on a firm level.

The first research question examines the role of institutional investors, adding to studies analyzing the relationship between institutional investors and sustainability such as T. Chen et al. (2020), and the cross-country study by Dyck et al. (2019), where the authors show that there is a causal relationship between the presence of environmentally and socially aware institutional investors and the environmental and social performance of their portfolio companies. The Krueger et al. (2020) and Bauer et al. (2021) survey results indicate that investors are aware of emerging sustainability issues, such as climate change, and that ESG objectives are of increasing importance when making investment decisions. Prior research shows that institutional investors adjust their capital allocation based on social performance (Graves & Waddock, 1994), ESG ratings (Hartzmark & Sussman, 2019), emissions data (Bolton & Kacperczyk, 2021), and ESG disclosure (Dhaliwal et al., 2011), and that institutional investors benefit from increased fund inflows when their mutual funds are acknowledged as being sustainable (Ammann et al., 2019; Hartzmark & Sussman, 2019). There are multiple channels that institutional investors can use to propagate their ESG objectives. For example, investors can engage in private conversations with management (Hoepner et al., 2016) or express their ESG-related viewpoints at companies' annual general meetings (Dikolli et al., 2022). This thesis extends these strands of the literature by analyzing how institutional investors shape sustainability related decisions of companies and how this affects capital market outcomes, focusing on channels that prior studies have not examined. Hence, the first research question asks:

RQ 1: How do institutional investors' sustainability preferences influence capital market outcomes and firm behavior?

To analyze this research question, the article presented in Chapter 2 examines the differences between debt and equity investors in their attitudes towards the ESG performance of their portfolio companies. While the theoretical construct for differences in preferences between debt and equity holders has long been established (Jensen & Meckling, 1976; Smith & Warner, 1979), the prior literature does not examine how this influences ESG performance. This study analyzes whether agency conflicts concerning investments in ESG are internalized if one investor holds both debt and equity instruments of a firm, thus aligning the normally diverging interests of shareholders and creditors. The following paper, presented in Chapter 3, looks at the impacts of an investment approach intended to foster sustainability in a portfolio, divestment. Divestment is a frequently discussed policy, which involves the disposal of all assets that do not meet certain (self-imposed) sustainability criteria. One of the first divestment movements was aimed at the apartheid regime in South Africa during the late 1980s, while during the recent past the focus has been on fossil fuel divestment, particularly coal (Hunt et al., 2017). Unlike past studies, which focus on divestment announcements by pension funds or university endowments (Dordi & Weber, 2019), this dissertation examines the divestment announcement by an asset manager. This distinction is of importance as asset managers might have different interests to pension funds and endowments, such as attracting capital inflows for their fee-driven business.

The second research question takes an opposite viewpoint, starting from firm-level characteristics. Past research shows that companies' sustainability actions have various impacts on their capital market performance. Studies cover areas such as cost of capital (Dhaliwal et al., 2011), credit default swap spreads (Kölbel et al., 2017, 2020), and stock returns (Grewal et al., 2019). Capital markets are also influenced by firms' ESG risks. Prior literature finds that firms' climate change risks, for example, through exposure to rising sea levels, translates into risk for their corporate bonds (Allman, 2020). Litigation risks arising from the negligence of social issues are another area of concern, resulting in negative share price development (Borelli-Kjaer et al., 2021).

At the same time, firms can take actions to mitigate negative consequences should sustainability risks materialize. Godfrey (2005) argues for the existence of an insurance-like effect of ESG actions which partially shields firms against the negative financial fallout following the occurrence of risks. One example is ESG disclosure, which reduces the negative stock price reaction following cases of corporate misconduct (Christensen, 2016). The risk of large drops in share price is also attenuated by strong ESG performance (Y. Kim et al., 2014). Building on these strands of literature, this dissertation assesses further ESG top-

ics that might influence capital market outcomes. Thus, the second research question asks:

RQ 2: How do company-level sustainability characteristics impact firms' capital market performance?

This thesis examines two particular areas that shape a firm's sustainability profile: human rights litigation and biodiversity management. The paper presented in Chapter 4 analyzes how human rights litigation cases (i.e., incidents where risks have already materialized) influence firms' stock price and what actions firms can take to attenuate the negative capital market reactions to a litigation case. The respect of human rights is one of the most basic social responsibilities companies have, yet, companies are repeatedly found to have violated them (Schrempf-Stirling & van Buren, 2017). The paper laid out in Chapter 5 looks at the importance of biodiversity management as a channel for companies to proactively mitigate their biodiversity risks. While climate risks have been extensively analyzed (Giglio et al., 2021), other environmental issues have been neglected by scholarly research.

By aiming to answer the stated research questions, this dissertation analyzes how both investors and companies can be the driving force behind ESG actions and how these actions can influence capital market outcomes. The following section provides a short introduction to the different papers included in this dissertation.

1.3 Outline of the Thesis

Chapter 2: The Effect of Institutional Dual Holdings on CSR Performance

The first paper analyzes the varying preferences of debt and equity investors regarding sustainability. Different preferences of different interest groups might lead to agency conflicts. Generally, agency conflicts concerning firms' corporate social responsibility (CSR)[1] actions arise between various stakeholders in a company, such as management (Harjoto & Jo, 2011), shareholders (Barnea & Rubin, 2010), and the board of directors (Dey, 2008). Prior literature examines agency conflicts and finds mitigating factors, such as managerial compensation (Bebchuk & Fried, 2003) or debt covenants (Amihud et al., 1999; Reisel, 2014). However, agency conflicts between the providers of capital and possible mitigating factors have long remained hard to analyze empirically, despite the theoretical foundations established by Black (1976), Jensen and Meckling (1976), and Smith and Warner (1979).

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[1]Following Gillan et al. (2021), the terms CSR, ESG, and sustainability are treated interchangeably.

Only recently have certain types of investors offered a possibility to examine agency conflicts between the two parties. With the increasing activity of non-commercial banks in the syndicated loan market, financial conglomerates have emerged that hold both debt and equity securities of the same firm. These so-called dual holders were first analyzed by Jiang et al. (2010) and provide an opportunity to examine how firm characteristics and policy outcomes are altered by agency conflicts between creditors and shareholders. While several studies use dual holders to analyze conflicts between debt and equity investors and the effect on different variables such as mergers (Bodnaruk & Rossi, 2016), risk taking (Yang, 2017), payout policy (Chu, 2018), and financial distress (Chu et al., 2018), the literature remains silent on how dual holders influence CSR. Thus, this study is the first to analyze agency conflicts between creditors and shareholders and their effect on a firm's CSR performance.

We combine a dataset of syndicated loans and institutional shareholdings for the US for a 16-year period. Using regression analysis, we examine whether firms that have a dual holder (i.e., an investor simultaneously holding both debt and equity claims in a firm) see an increase in their CSR performance. Our results show that the presence of dual holders leads to an average increase in CSR performance of around 4 percent. We find that our results hold independent of the type of investor, that is, whether the dual holder is a commercial bank or not. Moreover, especially firms with poor corporate governance benefit from the presence of a dual holder.

In a next step, we try to establish a causal effect of dual holders on CSR performance. We use institutional mergers between separate lenders and equity holders as a natural experiment involving the shareholder-creditor conflict (Anton & Lin, 2020; Chu, 2018). Institutional mergers might lead to the creation of some dual-holding positions which where previously separated holdings. Yet, due to the large and diverse portfolios of institutional investors, mergers are unlikely to happen because both institutions want to create a dual holding position in some of their portfolio companies. Building on these exogenous shocks, we find that firms which exhibit dual ownership for the first time due to an institutional merger increase their CSR activities to a greater extent than a matched control group. These results give confidence for a causal relationship between dual holders and an increase in CSR performance.

Our results show that institutional investors with their complex portfolios can shape firms' CSR activities. With the increasing importance of CSR for institutional investors, it is crucial to analyze how modern financial institutions are themselves one of the driving forces behind firms' CSR actions.

Chapter 3: The Capital Market Impact of Blackrock's Thermal Coal Divestment Announcement

The paper presented in Chapter 3 analyzes the impact of a capital allocation approach that has recently gained attention among sustainability-oriented institutional investors, divestment. Using an event study approach, this paper looks at the share price consequences for listed thermal coal mining companies after the largest asset manager in the world, Blackrock, announced a partial withdrawal from companies operating in this field. Thermal coal is mainly used for power production, unlike metallurgical coal which is used as an input factor in steel production. According to the International Energy Agency (IEA) (IEA, 2019), in 2018, coal-fired electricity generation accounted for 30 percent of all global carbon emissions and remained the main source for electricity generation with a share of 38 percent. However, McGlade and Ekins (2015) find that to meet the target of a maximum 2° Celsius temperature increase compared to pre-industrial levels, 80 percent of current coal reserves need to be left unburned. Coal companies are thus under constant pressure from the public, financial institutions, and regulatory authorities to justify their societal license to operate. This paper addresses the second research question of this dissertation by shedding light on the impact that institutional investors' sustainability-related decisions can have on financial markets. We extend existing studies on the consequences of divestment (Plantinga & Scholtens, 2021; Rohleder et al., 2022) by focusing on the financial impact of divestment announcements and the thermal coal industry. Using an extensive database on thermal coal companies around the world, our results show that large coal miners headquartered in the US were particularly affected. On average, the stock price of these firms had fallen by −5.88 percent by the end of the third trading day following Blackrock's divestment announcement in early 2020. For the overall sample of thermal coal mining firms the results are either insignificant at frequently applied levels of statistical significance or slightly negative. Further analysis shows that the stock price of the divesting asset manager saw a significant increase on the day following the divestment announcement and that the divestor had started reducing its exposure to the most affected companies before the announcement was made.

The results of this study increase our understanding of divestment as a novel investment approach incorporating sustainability. It extends existing studies on other ways of engagement, such as shareholder proposal (Flammer, 2015) or confidential conversations with management (Hoepner et al., 2016). We find that just the announcement of divestment by an, albeit large, asset manager influences the stock prices of heavily affected firms, thus directly impacting their cost of capital. Moreover, the positive reaction reflected in

the stock price of the divestor shows that the capital markets acknowledge the divestment from thermal coal-producing companies as value-creating to the mainly fee-driven business model of asset managers.

Chapter 4: The Boundaries of Corporate Mens Rea: The Case of Human Rights Litigation

The third study looks at cases of corporate social irresponsibility (CSI) concerning human rights violations and addresses Barnett et al.'s (2018) call for further research on the role of CSR activities in cases of litigation. Building on the results of Godfrey et al. (2009) and his application of corporate mens rea in financial research, this study investigates shareholders' reactions to the filing of human rights litigation cases against listed companies. Additionally, this study analyzes how a firm's overall commitment to CSR and its human rights policy (where present), as a specific precautionary CSR measure, influence investors' reaction. Prior studies show that shareholders' reaction to corporate misconduct varies (Barnett, 2014; Lange & Washburn, 2012). For example, non-financial disclosure provides an insurance-like effect and mitigates the negative capital market reaction in cases of CSI (Christensen, 2016). Godfrey (2005) points out that establishing mens rea (i.e., the "guilty mind" requirement in common law), is an important factor influencing the capital market reaction.

Using a novel database that includes a broad and global sample of litigation cases, this study includes different legislative systems and different types of human rights violations. A first analysis shows only marginal negative market reaction to the filing of human rights litigation cases. In a next step, the study looks at how CSR activities shape this reaction. A regression analysis shows that companies with stronger CSR performance experience a stronger decline in share price. However, the presence of a human rights policy dampens the negative capital market reaction.

In an additional analysis, the study considers press coverage of these litigation cases as media attention plays a vital role in the capital market reaction to CSI (Carberry et al., 2018). The results show that if financial news outlets cover misconduct cases this amplifies the drop in shareholder value. Moreover, high press coverage reduces the shielding impact of a human rights policy on the capital market reaction. Articles published in the general media do not influence the capital market reaction, indicating that only high-profile coverage (i.e., those covered in the financial press) influences shareholder reaction. These moderation patterns are in line with Kölbel et al. (2017), who find that press coverage by outlets with a wide reach strongly influences financial risk in the case of CSI.

This study is the first to empirically analyze the consequences of human rights litigation for shareholder value, extending our understanding of the importance of human rights for corporations. Prior empirical research so far has only focused on specific human rights issues, such as modern slavery (Cousins et al., 2020), discrimination (Hirsh & Cha, 2015), the assassination of activists (Kreitmeir et al., 2020) and sexual harassment (Borelli-Kjaer et al., 2021). The results show that investors react quickly (i.e., on the filing date of the lawsuit) when companies are accused of social irresponsibility in regard to human rights. Additionally, and more broadly, the results extend existing literature on the consequences of litigation on shareholder value, with prior research focusing on topics such as shareholder-initiated lawsuits (Gande & Lewis, 2009) or litigation due to environmental wrongdoing (C. Liu et al., 2020). Moreover, the findings answer the non-trivial question of how the capital market reacts to negative events in a field of CSR (in this case, human rights) in which a company has measures in place supposedly to prevent the occurrence of such issues in the first place. On the one hand, this may have a similar effect as the aforementioned insurance-like effect of overall CSR. On the other hand, investors might perceive the occurrence of such an issue as an indicator that the measures put in place by the firm (i.e., a human rights policy) are not sufficient to prevent negative events. The results give support to the first possibility, implying that the preventive addressing of sub-issues within CSR is of importance to investors when assessing a firm in light of an issue in this specific sub-issue, and is perceived as value increasing.

Chapter 5: Biodiversity Management and Stock Price Crash Risk

Closely related to climate change, yet less present in academia and public attention is the importance of biodiversity and intact ecosystems and the risks attached to a loss thereof. Biological diversity (biodiversity) refers to "the variability among living organisms from all sources [. . .] and the ecological complexes of which they are part" (United Nations, 1992). With extinction rates at unprecedented levels (Pimm et al., 2014), the loss of biodiversity – and overall human alteration of ecosystems – is considered one of the top ten global risks (WEF, 2022). This not only includes physical risks such as reduced crop yields or water shortages, but also, among others, litigation and reputational risks. Academic research on the financial impacts of biodiversity loss or the disclosure of biodiversity risks has thus far been limited to qualitative studies on biodiversity reporting (Rimmel & Jonäll, 2013; van Liempd & Busch, 2013) and its determinants (Adler et al., 2018; Bhattacharyya & Yang, 2019). This is due to a lack of indicators for granular biodiversity risk exposure on

a firm level. While proxy variables on climate change risks, such as carbon emissions, are well established, similar indicators for biodiversity risks do not exist.

This study analyzes whether strong biodiversity management mitigates a firm's financial risk. We build a global sample of companies using a novel dataset on biodiversity management by Vigeo Eiris, a subsidiary of Moody's. Our proxy for financial risk is stock price crash risk, a frequently applied measure in academic research (J.-B. Kim et al., 2021; Y. Kim et al., 2014). Building on prior research which finds that strong environmental management reduces a firm's financial risk (El Ghoul et al., 2018; Y. Kim et al., 2014), we argue that strong biodiversity management reduces a firm's financial risk through decreased biodiversity risks. Our results support this hypothesis as we find that companies with stronger overall biodiversity management see a decrease in their stock price crash risk. Subsequently, we conduct an interaction analysis and find that companies in need of legitimacy (i.e., those with low overall ESG performance or low profitability) see a decrease in their stock price crash risk if they receive positive stakeholder feedback on their biodiversity management and activities. In an additional analysis, we combine our sample with data on environmental inspections in the US. We observe that firms which have been subjected to an inspection see an increase in stock price crash risk in the following year, indicating that a firm's management of biodiversity around its operating facilities is a potential financial risk factor. Thus, the inspection of a firm's facilities is one channel through which new information on biodiversity management is revealed to the public. A robustness check shows that biodiversity management is not simply an indicator of firms' awareness of ESG topics. We build a control variable – firms' internal ESG awareness, proxied by the number of sustainability-related policies a firm has in place – and find that our results hold when including this variable.

The results of this study contribute to two strands of literature. First, it adds to prior studies analyzing the importance of non-financial risk factors and stock price crash risk (e.g., Y. Kim et al., 2014). Second, it underlines that environmental factors other than climate change are of importance for companies' financial risk. In particular, the results increase our understanding of corporate biodiversity issues by showing the financial consequences of biodiversity management and actions. Prior research so far has mainly focused on biodiversity reporting and its determinants (Adler et al., 2018; van Liempd & Busch, 2013). Overall, this study shows that biodiversity management can mitigate firms' financial risk, decreasing the likelihood of a sudden drop in a company's share price. Accordingly, investors should pay attention to companies' dependencies and impact on biodiversity and ecosystem services before taking investment decisions.

1.4   Contribution and Avenues for Future Research

Following the stated research questions, this thesis analyzes how sustainability-related decisions by institutional investors and firms influence capital market outcomes and how investors impact firm behavior. A particular contribution is the analysis of emerging topics within sustainable finance and the financial consequences they have. This dissertation acknowledges the recent findings of divergent ESG ratings across rating providers (Berg et al., 2022; Dimson et al., 2020) and explores their implications by mainly focusing on specific sub-topics of ESG rather than analyzing overall ESG performance.

This thesis extends our knowledge of how institutional investors can be a driving force for stronger company ESG activities. Hence, it adds to studies such as that by Dyck et al. (2019). The results underline how institutional investors can alter firm behavior through their role as important stakeholders (Chapter 2) or influence capital markets with sustainability-oriented announcements (Chapter 3). Additionally, this thesis points out channels that investors can use to foster sustainability actions on a company level. As well as joining voluntary initiatives such as the Principles for Responsible Investment (PRI) (Hoepner, Majoch, & Zhou, 2021) or engagement through voting on shareholder proposals (Dikolli et al., 2022), the divestment of portfolio positions is another way through which institutional investors can exert influence. A wider assessment of the financial implications of divestment for the divesting financial institutions might be of interest for future studies and of great value to institutional investors faced with stakeholder demand for portfolio decarbonization.

Moreover, this thesis adds to the literature on how firm-level sustainability characteristics can shape firms' financial positions (Christensen, 2016; Godfrey et al., 2009). In particular, it shows which topics are considered financially material and which actions managers can take to mitigate the negative consequences of sustainability risks (e.g., implementing a human rights policy or striving for strong biodiversity management). Additionally, this dissertation shows the importance of social issues (Chapter 4) and environmental topics other than climate change (Chapter 5) as well as the potential impact on companies' financial position should sustainability-related risks materialize. Here, this dissertation provides guidance for future research as both topics have only recently gained more attention in the academic literature and from investors. Future research might extend the findings on firm-level biodiversity risks by developing more granular biodiversity performance variables, that is, through joint work with natural sciences.

This dissertation adds to multiple strands of theoretical literature. First, it adds to studies on expectancy violation theory in the case of CSI (Hoepner, Li, & Muzanenhamo,

2021; Zachary et al., 2023). Second, it extends the literature on agency conflicts between shareholders and debtors as well as between managers and shareholders (Chu, 2018; Jiang et al., 2010). Third, the study on the importance of stakeholder feedback on biodiversity management and its mitigating impact on stock price crash risks adds to the literature on legitimacy theory (Chiu & Sharfman, 2011; Kölbel et al., 2020). Empirically, the papers extend existing research on the application of different econometric methods in the field of sustainable finance. Two of the studies conduct event studies to analyze the capital market impact of distinct events. All studies include some sort of external shock (i.e., mergers or environmental inspections) in an aim to establish a causal relationship in addition to correlational evidence. Thus, the papers might provide guidance for future studies on the use of potential exogenous shocks.

Additionally, this dissertation has implications for practitioners. The results can provide guidance for institutional investors on how to deal with the increasing importance of environmental and social issues. First, large financial institutions can use the findings of the study on dual holders in Chapter 2 when assessing their large and diverse portfolios and how this impacts firms' ESG performance. Second, the results in Chapter 3 show that divestment has capital market implications for the divestees and that investors acknowledge the divestment announcement as potentially value-increasing for the divesting institution. This might guide investors when assessing divestment decisions, especially with increasing investor and stakeholder demand for the decarbonization of investment portfolios. Third, the study on the capital market consequences of human rights litigation cases shows managers how implementing a human rights policy provides an insurance-like effect in the case of litigation. Thus, this study underlines the value of implementing corporate policies on human rights. Regulators might use these findings when developing new disclosure standards and ask for the reporting of such policies. One example of ongoing regulation is the development of the European Sustainability Reporting Standards. Investors might look for the existence of such policies before making an investment in order to avoid the negative return should a human rights litigation case be filed. Finally, the study on biodiversity management presented in Chapter 5 indicates that investors should pay attention to the management of biodiversity issues and not solely focus on climate change as the only environmental risk factor.

Overall, this dissertation analyzes some of the manifold topics within sustainable finance. It points out how investors react to emerging sustainability-related risks and identifies measures that firms can take to cope with them.

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Chapter 2

The Effect of Institutional Dual Holdings on CSR Performance

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2.1 Introduction

Creditors and shareholders have differing access to a firm's cash flow and inside infor-
mation as well as varying levels of influence on managerial decisions, so their attitude
towards investments in certain areas and their overall assessment of risk differ substan-
tially, too Jensen and Smith (1985). Smith and Warner (1979) define four fields in which
agency costs materialise: excessive dividend payments, claim dilution, asset substitution,
and underinvestment. Various strands of research examine these conflicts and point out
possible mitigating effects, such as managerial compensation (Bebchuk & Fried, 2003)
and debt covenants (Amihud et al., 1999; Reisel, 2014). While multiple studies analyse
agency issues between management and shareholders in regard to several aspects of cor-
porate social responsibility (CSR) (Ferrell et al., 2016; Harjoto & Jo, 2011), the literature
has remained silent in regard to conflicts between creditors and shareholders and their
effect on CSR. Our study fills this gap by analysing how the internalisation of agency con-
flicts between these two parties affects CSR, an area increasingly important to managerial
decision-making due to stakeholder demand. Analysing the levels of CSR that creditors
and shareholders find appropriate helps to understand the overall value of CSR for capital
providers and for which of the two it is of greater importance. Studying dual holding firms,
i.e., firms in which an investor simultaneously holds debt and equity claims, is a unique
opportunity to examine the internalisation of agency conflicts and how it influences firms'
CSR performance. Previous studies show that dual holders mitigate existing conflicts
between shareholders and creditors. For instance, Jiang et al. (2010) and Ferreira and
Matos (2012) demonstrate how dual holders influence loan characteristics. Chu (2018)
and Chava et al. (2019) analyse the impact of dual holders on firms' behaviour and in-
vestment decisions, respectively. We extend the literature on dual holdings by examining
how this special type of investor influences the CSR performance of companies.

    We base our analysis on a sample of 11, 391 firm-year observations spanning the period
from 2001 to 2017 by merging a dataset derived from the LPC DealScan syndicate loan
database with the universe of firms covered by the Thomson Reuters Asset4 database.
To analyse the relationship between dual holdings and CSR, we regress CSR performance
proxy variables on dual holdings variables while controlling for the indicators that Mc-
Carthy et al. (2017) have found to be determinants of CSR activity. To support our
baseline results and relieve potential endogeneity concerns, we use mergers between insti-
tutional investors as a quasi-natural experiment. We define our treated firms as those with
an institutional dual holder originating from a merger between a lender and a shareholder,
i.e., a position that evolved exogenously. In considering dual holders, which we define at

the parent level in line with Chu (2018), our study acknowledges the complex structure of modern financial institutions.

Our sample shows that more than 30% of all observations have a dual holder, which echoes the results of Anton and Lin (2020) and underlines the fact that dual holders are a frequent phenomenon among listed companies. In line with other studies on dual holders, our main findings provide support for the notion that dual holders lead to an incentive alignment and a reduction in agency conflicts between debtholders and shareholders. In the context of our study, the presence of dual holders has a positive impact on a company's CSR performance. Firms with a dual holder have an Asset4 CSR score that is on average 2.11 points higher than that of firms without. As the average Asset4 CSR score in our sample is 50.66, this represents a 4% increase in CSR rating. This positive effect increases with the number of unique dual holders within a firm and the combined equity stake they hold. Using a difference-in-differences regression on a propensity score-matched sample, we find that treated firms - that is, firms with a dual holder arising after an institutional merger - exhibit a stronger increase in CSR performance than comparable control firms.

The remainder of this paper is structured as follows. The next section provides an overview of the existing literature on shareholder-creditor agency conflicts and their influence on various firm characteristics and investment policies. Section 2.3 shows our sample selection process and defines the variables used in our empirical approach. Summary statistics as well as the empirical results are presented in section 2.4. Section 2.5 concludes.

2.2 Literature Review and Hypothesis Development

Several studies have analysed the impact of simultaneous holdings of equity and debt securities on agency costs or corporate policies. Among the first to examine this special type of governance structure were Jiang et al. (2010), who find that firms that issue syndicated loans receive significantly lower yield spreads if at least one member of the syndicate is a non-commercial banking dual holder. Ferreira and Matos (2012) focus on the role of banks as dual holders and their impact on loan spreads and find that dual holdings face lower loan spreads, especially during the 2007-2008 financial crisis. Bank representatives on the board of directors are a further indicator of enhanced corporate governance and internalised agency conflicts. Santos and Wilson (2017) show that these bankers reduce the loan spreads of the companies in question. Bodnaruk and Rossi (2016) use bond data to show that there is coordination in financial conglomerates when one of their dual holdings is a target in an M&A deal and that dual holders accept lower equity

premia in exchange for higher bond returns. They argue that these bond returns arise from M&A targets being riskier than the acquirers, and further show that dual holders are more likely to vote in favour of an M&A proposal with the voting rights of their equity stake. Lopatta et al. (2016) find that the presence of dual holders acts as a substitute for accounting conservatism, a method which reduces agency conflicts. Their findings indicate that dual holders reduce agency costs, ensure better governance, and reduce information asymmetry as reflected in tighter bid-ask spreads. Moreover, they show that market valuation, expressed in Tobin's Q, is higher for firms that are dual-held.

Smith and Warner (1979) point out that the diverging claims between the two parties to the company's cash flow may induce shareholders to favour highly risky projects. Because creditors hold a fixed claim, their upside risk is capped at the interest rate of the loan and the potential gain of these projects mainly accrues to the shareholders. Dual holders maximise their overall portfolio wealth, unlike pure equity holders which are only concerned about shareholder value. They thus lead management to engage in less risk-shifting, which reduces the value of claims held by creditors to the advantage of those held by shareholders. Chava et al. (2019) provide empirical support for this notion by showing that the presence of capital expenditures restriction covenants in loan contracts is associated with less risk-shifting. They find that this relationship is stronger the larger the stake of dual holders participating in a lender syndicate. Thus, the presence of dual holders acts as a substitute for restrictive covenants. Their presence also affects a company's overall risk-taking. Y. Liu (2015) provides evidence that dual-held companies have lower business risk, measured by return on assets (ROA) volatility and the Merton distance-to-default model. Yang (2017) examines the effect of dual holders on corporate innovation and finds evidence of a reduction in risk-shifting using patents as a proxy for innovation. He finds that the number of patents decreases, mainly for patents that are unrelated to the core business of the firm, while the average market value of patents related to the core business increases, which further supports his assumption.

Excessive dividend payments are another outcome of the agency conflict between debtholders and shareholders. Here, Chu (2018) shows that firms with a dual holder resulting from an institutional merger pay significantly lower dividends than counterfactual firms, with the effect amplified by financial distress. In a subsequent study, Chu et al. (2018) present further evidence for an incentive alignment, as firms in financial distress with the presence of dual holders are significantly less likely to file for bankruptcy and instead conduct out-of-court restructuring. A recent paper by J. Y. Liu (2019) shows that dual-held firms have lower cash holdings because their agency costs of debt are lower. The above studies demonstrate that dual holdings lead to lower agency costs, which is

reflected in lower loan spreads as well as internal firm decisions such as innovation and payout policy.

CSR activities have been related to several types of agency conflicts in the literature. Ferrell et al. (2016) show that firms with fewer agency concerns have greater CSR engagement and that this engagement creates value for the company as measured by Tobin's Q. Company insiders may have different incentives to engage in CSR. Barnea and Rubin (2010) show that insiders overinvest in CSR for their own personal benefit. This effect is mitigated if the insiders hold a large share in the companies' equity, as they bear some of the costs associated with overinvestment in CSR. Agency conflicts among different stakeholders, i.e., executives and shareholders, thus influence CSR activities. Furthermore, Harjoto and Jo (2011) show that firms also use CSR to tackle agency conflicts. The authors argue that with more effective corporate governance, firms step up their CSR engagement to satisfy external stakeholders. Masulis and Reza (2015) show that CEOs use corporate contributions opportunistically for their own personal benefit, underlining the agency conflicts between executives and shareholders in regard to philanthropy. Higher agency costs, measured by free cash flow and corporate cash holdings, in family-controlled firms also lead to lower CSR performance, as shown by El Ghoul et al. (2016). As decreased agency conflicts relate to an increase in CSR engagement, and since prior studies have shown that dual holders partially internalise the agency conflicts of debtholders and shareholders, we expect a positive relationship between the existence of dual holders and CSR performance.

The overall positive relationship between CSR and financial performance is well established in the literature (see Friede et al. (2015) for an overview). Dual holders interested in maximising their portfolio wealth may thus request their dual holdings to increase their CSR activities to ultimately boost their financial performance. The positive relationship between the presence of dual holders and market valuation of dual-held firms, as measured by Tobin's Q, has been shown by Lopatta et al. (2016) and is a first indication of the expected dependency between the presence of dual holders and CSR performance. We thus posit the following hypothesis:

Hypothesis 1 (H1)**.** *The presence of dual holders in a given firm leads to a higher CSR performance of that firm.*

Since it is reasonable to assume that the effect of dual holders on CSR performance is stronger when more dual holders are present or their voting power, i.e., their equity stake, is higher, we formulate our second and third hypotheses as follows:

Hypothesis 2 (H2). *A higher number of dual holders in a given firm leads to a higher CSR performance of that firm.*

Hypothesis 3 (H3). *A higher equity stake of dual holders in a given firm leads to a higher CSR performance of that firm.*

2.3 Sample and Variable Selection

2.3.1 Sample Construction

Our sample covers a period of 17 years starting in 2001, when the Thomson Reuters Asset4 data was first published, and ending in 2017 and consists of 2,156 distinct firms and 11,391 firm-year observations. We use the Asset4 environmental, social, and governance (ESG) score as a proxy for CSR performance. We further use the Compustat database to retrieve company fundamentals, Thomson Reuters 13F data for information on equity ownership, and LPC DealScan for data on syndicated loans. We use syndicated loans instead of bonds, following Amihud et al. (1999) who argue that syndicated loans have a lower liquidity than bonds and that the owners of loans are more likely to engage in monitoring. This is also in line with other studies on dual holdings that rely on syndicated loan data (Chava et al., 2019; Chu, 2018; Jiang et al., 2010). In order to identify dual holdings, we combine the LPC DealScan database with the Thomson Reuters 13F dataset. The former is the most comprehensive database of syndicated loans in the US and covers creditors that participate in a loan syndicate and their invested amount at the time of origination, while the latter provides a quarterly overview of ownership data filed by US institutional investors with the Securities and Exchange Commission (SEC), capturing all of their equity investments.

To define an investor as a dual holder only if the exact same entity holds debt and equity instruments of a company would not capture the complex structure of modern financial institutions. We hence extend our analysis by considering both the parents and subsidiaries of investors as dual holders. We rely on information provided by the Federal Financial Institutions Examination Council to examine the ultimate parent company associated with the loan. If no filings are available from this database, we use lenders' 10K filings as an additional source.

To relieve the problem of endogeneity, we rely on mergers between institutional investors through which dual holding positions arise. Several studies use mergers and acquisitions between institutional investors as a quasi-natural experiment to establish a causal link between dual holdings and their variables of interest (Anton & Lin, 2020; Chu, 2018;

Chu et al., 2018; Keswani et al., 2020; Yang, 2017). These studies argue that mergers and acquisitions of financial institutions are a result of changes in regulation, overall business strategy, or advantages in economies of scale or scope (Jayaraman et al., 2002) and not due to their investment holdings. Financial institutions have a large portfolio of different assets on their balance sheets. It is thus unlikely that two firms will merge specifically to create a dual holding position in some of their investment assets. Furthermore, mergers between separate debt and equity holders are exogenous with respect to the capital structure of the dual holding firms, which are the subject of our analysis. We retrieve all mergers and acquisitions between financial institutions from the SDC Platinum database and match them with our dataset to identify new dual holdings that arise due to these events.

2.3.2 Dual Holding Variables

Following Chu (2018) we set a threshold that the potential dual holder must reach in order to identify significant equity holders. We consider a company invested in a firm's syndicated loan to be a dual holder only if it (or one of its parents/subsidiaries) simultaneously holds an equity claim amounting to at least 1% of all outstanding shares and a 10% share in a firm's loan at the time of origination. We follow Yang (2017) and Chava et al. (2019) and use three different variables to assess the influence of dual holders on a given firm. First, we construct a binary variable (Dual Holding), which is equal to one if at least one company is considered a dual holder as defined above, and zero otherwise. Secondly, we use the natural logarithm of one plus the total number of unique dual holders in a given year to construct our second measure of dual holdings (Number of Dual Holders). We assume that the more dual holders a firm has, the greater their influence on the firm's CSR policy. Thirdly, we define our variable Equity Share of Dual Holders as the natural logarithm of one plus the sum of the average equity share of each dual holder to consider the impact on the total share capital the dual holders have in a given firm. We expect a stronger impact on our dependent variable and hence a greater influence of dual holders in a given firm.

2.3.3 Control Variables

We follow McCarthy et al. (2017) and use several control variables which the prior literature finds to be determinants of CSR. These are firm profitability, size, leverage, differentiation, innovation, capital expenditure, managerial entrenchment, and outside monitoring. Except for size, entrenchment, and outside monitoring, we scale all variables by the book

value of total assets at the beginning of the respective year to make the variables comparable across firms.

We proxy for firm profitability by employing a firm's earnings before extraordinary items in our analysis. The natural log of the book value of total assets at the beginning of each year is our measurement of size. We proxy for leverage by using a firm's long-term debt and advertising expenses and R&D expenses are our proxies for firm differentiation and innovation, respectively. McCarthy et al. (2017) use capital expenditures as a proxy for the reliance on reputation, which we follow. The E-Index developed by Bebchuk et al. (2009) defines several firm characteristics, such as the existence of a poison pill or a golden parachute as signs of entrenchment. The E-Index is our proxy for managerial entrenchment. The sum of institutional investors with an equity stake greater than 5% captures outside monitoring. We derive most of these variables from Compustat, except for the managerial entrenchment variable, which we construct using ISS Governance data for the years following 2006. Bebchuk et al. (2009) provide the data for the period prior to this year on their website. Table 2.13 in the Appendix offers an overview of the control variables as well as the dependent and dual holding variables used in our empirical analysis.

2.4 Empirical Results

2.4.1 Summary Statistics

Table 2.1 provides a summary of our sample distribution and shows that 33% of all firm-year observations in our sample have a dual holder. Out of all 2,156 firms, 606 distinct firms have a dual holder in a given year. The dual-held firms are almost evenly distributed across time with the exception of 2017, when only 18% of all observed firms had a dual holder.

Table 2.2 displays descriptive statistics for all variables we employ in this study. We winsorize all independent variables at the 1% and 99% quantile to mitigate the influence of outliers. Table 2.2 shows a majority of observations for both the R&D and advertising expenses are zero. Nevertheless, we follow McCarthy et al. (2017) and include the two variables in our analysis. The maximum number of unique dual holders in a given firm is 18. Table 2.3 shows the pairwise correlation coefficients for all variables used in our analysis. Since we use only one measure for CSR and one dual holdings variable in the same regression, collinearity between different CSR performance measures and different dual holding definitions does not influence our results. The positive correlation coefficients

Table 2.1: This table shows the distribution of the firm-year observations across time. We allocate firms to the Dual Holding column if they have at least one dual holder during a given year, and to the No Dual Holding column otherwise.

Year	No Dual Holding	Dual Holding	Total
2001	44	20	64
2002	144	99	243
2003	151	109	260
2004	239	140	379
2005	246	157	403
2006	240	171	411
2007	285	197	482
2008	369	252	621
2009	371	281	652
2010	447	223	670
2011	433	253	686
2012	442	254	696
2013	439	274	713
2014	467	291	758
2015	779	365	1,144
2016	970	415	1,385
2017	1,481	343	1,824
Total	7,547	3,844	11,391

Table 2.2: This table provides descriptive statistics for the firm-year observations used in our analysis. Table 2.13 in the appendix provides definitions for all variables.

Variables	N	Mean	SD	Min.	Max.
Asset4 ESG	11,391	50.66	17.29	19.59	89.13
Asset4 Environmental	11,391	42.72	31.42	8.96	95.31
Asset4 Social	11,391	45.28	29.22	6.69	96.38
Asset4 Governance	11,391	72.04	18.08	16.74	96.70
Dual Holding	11,391	0.34	0.47	0.00	1.00
Number of Dual Holders	11,391	0.44	0.68	0.00	2.89
Equity Share of Dual Holders	11,391	0.01	0.02	0.00	0.30
Leverage	11,391	0.24	0.21	0.00	1.01
Profitability	11,391	0.05	0.09	-0.35	0.31
Advertising expense	11,391	0.01	0.03	0.00	0.17
R&D expenditure	11,391	0.02	0.05	0.00	0.32
Capital expenditure	11,391	0.04	0.05	0.00	0.28
ln(Size)	11,391	8.76	1.56	5.20	13.20
E-Index	11,391	2.98	1.00	0.00	5.00
Blockholding	11,391	0.21	0.14	0.00	0.61

between our three dual holding variables and the scores retrieved from the Asset4 database indicate first support for our hypotheses.

Table 2.3: This table reports the pairwise correlation coefficients of all variables used in our analysis.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Asset4 ESG	1.00														
(2) Asset4 Environmental	0.80	1.00													
(3) Asset4 Social	0.79	0.80	1.00												
(4) Asset4 Governance	0.60	0.56	0.60	1.00											
(5) Dual Holding	0.21	0.23	0.25	0.21	1.00										
(6) Number of Dual Holders	0.25	0.27	0.28	0.24	0.90	1.00									
(7) Equity Share of Dual Holders	0.09	0.12	0.12	0.12	0.48	0.60	1.00								
(8) Leverage	0.02	0.01	−0.02	0.00	0.12	0.12	0.07	1.00							
(9) Profitability	0.09	0.10	0.15	0.12	0.06	0.06	0.03	−0.10	1.00						
(10) Advertising expense	0.03	0.03	0.06	0.00	0.04	0.03	0.00	−0.01	0.18	1.00					
(11) R&D expenditure	0.02	0.02	0.01	−0.06	−0.07	−0.07	−0.05	−0.09	−0.19	0.01	1.00				
(12) Capital expenditure	0.02	0.05	0.06	0.07	0.09	0.09	0.04	0.07	0.15	0.07	−0.04	1.00			
(13) ln(At)	0.51	0.46	0.49	0.38	0.17	0.25	0.11	−0.04	−0.07	−0.13	−0.29	−0.10	1.00		
(14) E-Index	−0.15	−0.09	−0.08	−0.12	−0.01	−0.04	−0.02	0.03	−0.08	−0.03	0.07	0.02	−0.20	1.00	
(15) Blockholding	−0.18	−0.21	−0.26	−0.20	−0.05	−0.09	−0.08	0.14	−0.15	−0.01	0.08	−0.06	−0.33	0.11	1.00

2.4.2 Baseline OLS Results

To test our hypotheses, we employ the following OLS regression:

$$\text{CSR}_{i,t} = \alpha + \beta\text{Dual}_{i,t} + \sum_{j=1}^{J} \rho_j\text{Control}_{j,i,t} + \sum_{k=1}^{K} \tau_k\text{Industry}_{k,i} + \sum_{t=1}^{T} \psi_t\text{Year}_t + \epsilon_{i,t} \quad (2.1)$$

$\text{CSR}_{i,t}$ is our measurement of CSR activity, namely the overall Asset4 ESG score or the subscores thereof. $\text{Dual}_{i,t}$ represents one of our three variables measuring dual holdings and $\text{Control}_{j,i,t}$ are the variables that have been found to be predictors of CSR, as defined in section 2.3.3. $\text{Industry}_{k,i}$ and Year_t reflect industry and year fixed effects, respectively. We use the Fama and French 48-industry classification to construct industry fixed effects.

Table 2.4 displays the results of our baseline regression. The outcome supports Hypothesis 1, 2, and 3 as all dual holding variables have a positive sign and are highly statistically significant. Column 1 implies that, ceteris paribus, firms with the presence of at least one dual holder have on average a higher Asset4 score of 2.11 points than firms without an institutional investor that simultaneously holds debt and equity stakes in the firm. Our second dual holding variable (Number of Dual Holders) is used in column 2. The positive coefficient, which is significant at the 1% level, indicates that an additional dual holder increases the Asset4 score of a firm. A one standard deviation increase in this variable on average raises the Asset4 score by 0.66 points, or 1.3% if applied to the mean CSR score. Column 3 depicts the results of the third measure, Equity Share of Dual Holders. They are in line with the results of our other dual holding variables, indicating a positive relationship between the sum of the average equity holding of all unique dual holders and the CSR activity level.

To examine which of the three Asset4 subscores are most affected by dual holders, we perform further OLS regressions in which we replace the dependent variables with the three subscores. The results are shown in Tables 2.5, 2.6, and 2.7. All other variables and fixed effects remain unchanged. The results are in line with our main regression, which supports our research hypothesis since for all three subscores, the binary dual holding variable and the variable measuring the number of dual holders are positive and statistically significant at the 1% level. Notably, the Equity Share of Dual Holders variable is only statistically significantly different from zero for the environment subscore.

Table 2.4: This table reports the results of an OLS estimation of equation 2.1, regressing the overall Asset4 ESG score on our three different measures of dual holders and the respective controls. Column 1 shows the binary dual holding variable, which equals one if a firm has a dual holder in a given year, and zero otherwise. Column 2 depicts the regression results using the number of unique dual holders in a given firm. Column 3 renders the sum of the average equity stake of each dual holder in a firm. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Hyp.	Exp.	Asset4 ESG	Asset4 ESG	Asset4 ESG
Dual Holding	1	+	2.113***		
			(0.625)		
Number of Dual Holders	2	+		1.450***	
				(0.456)	
Equity Share of Dual Holders	3	+			18.663*
					(11.198)
Leverage			1.315	1.321	1.702
			(1.358)	(1.360)	(1.362)
Profitability			22.843***	22.765***	23.338***
			(2.685)	(2.690)	(2.711)
Advertising expense			10.046	9.944	11.175
			(15.593)	(15.570)	(15.683)
R&D expenditure			61.749***	61.508***	62.093***
			(7.687)	(7.708)	(7.791)
Capital expenditure			-1.616	-1.539	-1.079
			(7.573)	(7.621)	(7.630)
ln(At)			7.703***	7.667***	7.846***
			(0.215)	(0.219)	(0.206)
E-Index			-1.028***	-1.015***	-1.000***
			(0.290)	(0.290)	(0.292)
Blockholding			-1.793	-1.671	-1.460
			(1.884)	(1.885)	(1.892)
Constant			-30.331***	-30.264***	-31.654***
			(9.262)	(9.256)	(9.251)
Observations			11,391	11,391	11,391
Adjusted R-squared			0.444	0.444	0.442
Industry FE			YES	YES	YES
Year FE			YES	YES	YES

Table 2.5: This table reports the results of an OLS estimation of equation 2.1, regressing the overall Asset4 Environmental score on our three different measures of dual holders and the respective controls. Column 1 shows the binary dual holding variable, which equals one if a firm has a dual holder in a given year, and zero otherwise. Column 2 depicts the regression results using the number of unique dual holders in a given firm. Column 3 renders the sum of the average equity stake of each dual holder in a firm. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Hyp.	Exp.	Asset4 Environmental	Asset4 Environmental	Asset4 Environmental
Dual Holding	1	+	4.035***		
			(1.065)		
Number of Dual Holders	2	+		2.829***	
				(0.797)	
Equity Share of Dual Holders	3	+			57.820***
					(21.655)
Leverage			−1.346	−1.356	−0.752
			(2.393)	(2.392)	(2.402)
Profitability			32.324***	32.146***	33.123***
			(4.761)	(4.789)	(4.807)
Advertising expense			30.274	30.035	32.675
			(25.269)	(25.256)	(25.394)
R&D expenditure			93.074***	92.594***	93.857***
			(14.489)	(14.501)	(14.616)
Capital expenditure			9.957	10.096	11.301
			(12.155)	(12.225)	(12.297)
ln(At)			13.201***	13.124***	13.449***
			(0.383)	(0.391)	(0.370)
E-Index			−0.913*	−0.889*	−0.865*
			(0.495)	(0.495)	(0.496)
Blockholding			−7.424**	−7.199**	−6.816**
			(3.186)	(3.189)	(3.199)
Constant			−90.599***	−90.410***	−93.050***
			(7.978)	(7.973)	(7.959)
Observations			11,391	11,391	11,391
Adjusted R-squared			0.502	0.502	0.500
Industry FE			YES	YES	YES
Year FE			YES	YES	YES

Table 2.6: This table reports the results of an OLS estimation of equation 2.1, regressing the overall Asset4 Social score on our three different measures of dual holders and the respective controls. Column 1 shows the binary dual holding variable, which equals one if a firm has a dual holder in a given year, and zero otherwise. Column 2 depicts the regression results using the number of unique dual holders in a given firm. Column 3 renders the sum of the average equity stake of each dual holder in a firm. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Hyp.	Exp.	Asset4 Social	Asset4 Social	Asset4 Social
Dual Holding	1	+	4.443***		
			(0.975)		
Number of Dual Holders	2	+		2.780***	
				(0.727)	
Equity Share of Dual Holders	3	+			27.456
					(17.198)
Leverage			−1.351	−1.245	−0.460
			(2.187)	(2.200)	(2.204)
Profitability			43.478***	43.442***	44.596***
			(4.610)	(4.628)	(4.645)
Advertising expense			41.200*	41.175*	43.443*
			(24.813)	(24.797)	(24.984)
R&D expenditure			84.565***	84.148***	85.222***
			(13.052)	(13.076)	(13.219)
Capital expenditure			−2.220	−2.023	−1.259
			(11.363)	(11.459)	(11.529)
ln(At)			12.583***	12.545***	12.898***
			(0.352)	(0.356)	(0.342)
E-Index			0.135	0.166	0.196
			(0.447)	(0.448)	(0.449)
Blockholding			−11.391***	−11.090***	−10.675***
			(2.752)	(2.758)	(2.775)
Constant			−82.892***	−83.020***	−85.715***
			(8.509)	(8.504)	(8.491)
Observations			11,391	11,391	11,391
Adjusted R-squared			0.501	0.500	0.497
Industry FE			YES	YES	YES
Year FE			YES	YES	YES

Li et al. (2020) show that the presence of a high-CSR equity mutual fund as an investor is an important driver for firms to subsequently increase their CSR efforts. In line with Peyravan (2020) we separate the dual holders into commercial and non-commercial banking institutions by their SIC classification to examine whether non-commercial banking institutions, such as mutual funds, are driving our results. We follow Chava et al. (2019) and define an indicator variable, Only CB Dual Holders, which equals one if a firm has only commercial banking dual holders in a given year, and zero otherwise. Secondly, we assign a second indicator variable, Non-CB Dual Holders, a value of one if a firm has at least one non-commercial banking dual holder in a given year, and zero otherwise.

Table 2.8 shows that both types of investors are positively related with an increase in CSR activity in their dual holdings as both of the indicator variables are statistically significant at the 1% level for all of the Asset4 subscores.

According to Dang et al. (2018), results in the field of empirical corporate finance may not be robust to the choice of firm size measure. We thus follow their guideline and use two alternative variables to measure firm size. Specifically, we use a firms' natural logarithm of total sales to control for size in the firms' product market or market capitalization to control for a capital market measurement of size. We rerun all above described regressions and replace the previously mentioned proxy for size ln(At) with either ln(MCap) or ln(Sales). We present the results in Table 2.9.

The results show that our results are robust to the choice of firm size measure. All but one coefficient for any of our three different dual holding variables are statistically significant and possess the same sign as in the previous regressions.

2.4.3 Difference-in-Differences Regression

While the OLS regressions conducted in the previous section show the explanatory power and the overall positive relationship dual holders have with the CSR activity level of their investments, a causal link between the two has yet to be established. Our results could be due to endogeneity, as dual holders may prefer to invest in firms with strong CSR activity rather than being the driving factor of high CSR performance. We rely on mergers between separate debt and equity holders which create a dual holding position in one of their holding firms. Ex post, we expect this exogenous creation of a dual holder to lower agency conflicts between creditors and stockholders in a given firm, which may then have a positive impact on the firm's CSR performance.

To examine this relationship, we use a difference-in-differences regression and define treated firms as firms that become dual-held due to a merger between a lender and an

Table 2.7: This table reports the results of an OLS estimation of equation 2.1, regressing the overall Asset4 Governance score on our three different measures of dual holders and the respective controls. Column 1 shows the binary dual holding variable, which equals one if a firm has a dual holder in a given year, and zero otherwise. Column 2 depicts the regression results using the number of unique dual holders in a given firm. Column 3 renders the sum of the average equity stake of each dual holder in a firm. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Hyp.	Exp.	Asset4 Governance	Asset4 Governance	Asset4 Governance
Dual Holding	1	+	2.364***		
			(0.547)		
Number of Dual Holders	2	+		1.494***	
				(0.382)	
Equity Share of Dual Holders	3	+			15.017
					(9.519)
Leverage			1.390	1.441	1.861
			(1.559)	(1.558)	(1.564)
Profitability			15.978***	15.952***	16.570***
			(3.162)	(3.161)	(3.162)
Advertising expense			−7.645	−7.670	−6.448
			(19.933)	(19.812)	(19.691)
R&D expenditure			24.285***	24.057***	24.636***
			(7.166)	(7.201)	(7.253)
Capital expenditure			3.322	3.425	3.839
			(7.405)	(7.435)	(7.457)
ln(At)			5.057***	5.035***	5.224***
			(0.239)	(0.240)	(0.235)
E-Index			−0.867**	−0.851**	−0.835**
			(0.343)	(0.344)	(0.345)
Blockholding			−1.359	−1.201	−0.978
			(2.360)	(2.354)	(2.355)
Constant			−1.969	−2.022	−3.469
			(11.845)	(11.830)	(11.866)
Observations			11,391	11,391	11,391
Adjusted R-squared			0.291	0.291	0.288
Industry FE			YES	YES	YES
Year FE			YES	YES	YES

Table 2.8: This table reports the results of an OLS estimation of equation 2.1, regressing the different Asset4 ESG scores on two indicators for the presence of dual holders and the respective controls. Only CB Dual Holders is a binary variable, which equals one if a firm has only commercial banking dual holders in a given year, and zero otherwise. Non-CB Dual Holders is a binary variable, which equals one if the firm has at least one non-commercial banking dual holder in a given year, and zero otherwise. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Asset4 ESG	Asset4 Environmental	Asset4 Social	Asset4 Governance
Only CB Dual Holders	2.008***	4.030***	4.412***	2.844***
	(0.672)	(1.138)	(1.055)	(0.616)
Non-CB Dual Holders	2.279***	4.042***	4.493***	1.599**
	(0.850)	(1.482)	(1.314)	(0.747)
Leverage	1.301	-1.347	-1.355	1.456
	(1.359)	(2.395)	(2.187)	(1.564)
Profitability	22.832***	32.324***	43.474***	16.029***
	(2.685)	(4.764)	(4.610)	(3.161)
Advertising expense	10.059	30.275	41.204*	-7.703
	(15.584)	(25.266)	(24.813)	(20.043)
R&D expenditure	61.689***	93.072***	84.547***	24.562***
	(7.700)	(14.496)	(13.045)	(7.148)
Capital expenditure	-1.643	9.956	-2.228	3.444
	(7.576)	(12.157)	(11.359)	(7.384)
ln(At)	7.694***	13.201***	12.580***	5.097***
	(0.217)	(0.387)	(0.354)	(0.240)
E-Index	-1.026***	-0.913*	0.135	-0.875**
	(0.290)	(0.495)	(0.448)	(0.343)
Blockholding	-1.785	-7.423**	-11.389***	-1.397
	(1.885)	(3.186)	(2.750)	(2.365)
Constant	-30.262***	-90.596***	-82.871***	-2.287
	(9.266)	(7.997)	(8.508)	(11.852)
Observations	11,391	11,391	11,391	11,391
Adjusted R-squared	0.444	0.502	0.501	0.292
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 2.9: This table reports the results of an OLS estimation of equation 2.1, regressing the different Asset4 ESG scores on our three different measures of dual holders and the respective controls. ln(MCap) and ln(Sales) are the natural logarithm of a firm's market capitalisation and total sales, respectively. For brevity, we omit the resulting coefficients for the control variables and the constant. Industry and year fixed effects are used in all regressions. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

	Variables	Asset4 ESG	Asset4 Environmental	Asset4 Social	Asset4 Governance
ln(MCap)	Dual Holding	2.034***	4.122***	4.508***	2.296***
		(0.642)	(1.113)	(1.019)	(0.550)
	Number of Dual Holders	1.484***	3.079***	3.000***	1.500***
		(0.457)	(0.818)	(0.743)	(0.380)
	Equity Share of Dual Holders	25.602**	71.668***	40.727**	19.522**
		(11.197)	(21.964)	(17.333)	(9.497)
ln(Sales)	Dual Holding	2.084***	4.117***	4.357***	2.321***
		(0.616)	(1.066)	(0.962)	(0.543)
	Number of Dual Holders	1.580***	3.160***	2.952***	1.556***
		(0.443)	(0.784)	(0.709)	(0.374)
	Equity Share of Dual Holders	19.330*	60.465***	28.678*	15.264
		(11.097)	(21.564)	(16.795)	(9.395)

equity holder. Table 2.14 in the appendix gives an overview of our identification strategy. We require the treated firms to not have any dual holders prior to the merger. In our sample, we identify 105 treated firms which become dual-held during our sample period. The potential control group consists of all firms that never had a dual holder during our entire sample period. Equation 2.2 outlines our difference-in-differences approach:

$$
\begin{aligned}
\mathrm{CSR}_{i,t} =& \alpha + \beta_1 \mathrm{Treat}_i + \beta_2 \mathrm{Post}_t * \mathrm{Treat}_i + \beta_3 \mathrm{Post}_t \\
& + \sum_{j=1}^{J} \rho_j \mathrm{Control}_{j,i,t} + \sum_{k=1}^{K} \tau_k \mathrm{Industry}_{k,i} + \sum_{t=1}^{T} \psi_t \mathrm{Year}_t + \epsilon_{i,t}
\end{aligned} \tag{2.2}
$$

The variable Treat_i is a dummy which equals one if the firm is part of our treatment group, and zero otherwise. Similarly, we assign a value of one to the dummy variable Post_t in years after the merger event for both treatment and control firms and set the dummy to zero in years before the merger date. The interaction term $\mathrm{Post}_t * \mathrm{Treat}_i$ is equal to one for treated firms in years following the merger event, and zero otherwise. $\mathrm{Control}_{j,i,t}$ indicate the control variables used in our OLS regression. We use the Fama and French 48-industry classification for industry fixed effects. Our main variable of interest is the interaction term $\mathrm{Post}_t * \mathrm{Treat}_i$, which depicts the marginal impact on CSR activity if a dual holding position is the result of a merger between two financial institutions.

As the resulting number of treated firms is low compared to the overall sample, we perform propensity score matching (PSM) to identify control firms based on certain characteristics. Lemmon and Roberts (2010) and Erkens et al. (2014) use PSM to extract control firms. We conduct our matching approach based on leverage, profitability, size, and outside monitoring, defined in line with Table 2.13 in the appendix. Additionally, we require the control firms to be in the same industry based on the Fama and French 48-industry classification. We conduct our matching on the data one year prior to each merger with replacement. Table 2.10 displays summary statistics of the matched sample, which consists of 105 treated firms and 103 unique control firms. Only the difference in means for the Governance variable is statistically significantly different from zero at the 10% level, while all other mean differences are not. This underlines the success of the PSM in assigning each treated firm a control firm with similar characteristics. We apply the difference-in-differences regression on a six-year window around each respective merger, meaning three years before and three years after each merger event. By choosing a six-year window, we follow the prior literature (Chava et al., 2019; Chu, 2018; Yang, 2017) because the choice of time window involves a trade-off between the accuracy and relevance of our model. Were we to choose a longer period, we may capture other effects

Table 2.10: This table provides a summary of the variables used in the difference-in-differences regression for both treatment and control firms one year prior to the respective merger. Firms are assigned to the treatment group if they become dual-held as a result of a merger between two institutional investors that separately hold debt and equity positions during our sample period. The potential control group consists of all firms that had no dual holders over our entire sample period. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

Variables	Treatment group		Control group		Diff
	N	Mean	N	Mean	
Asset4 ESG	105	58.6343	103	57.2858	1.3485
Asset4 Environmental	105	59.7056	103	52.9350	6.7706
Asset4 Social	105	64.3460	103	58.1406	6.2054
Asset4 Governance	105	81.1961	103	78.2379	2.9582*
Leverage	105	0.2558	103	0.2389	0.0169
Profitability	105	0.0731	103	0.0735	−0.0004
Advertising expense	105	0.0110	103	0.0149	−0.0039
R&D expenditure	105	0.0205	103	0.0142	0.0063
Capital expenditure	105	0.0526	103	0.0589	−0.0063
ln(At)	105	9.6973	103	9.4797	0.2176
E-Index	105	2.9429	103	2.7961	0.1467
Blockholding	105	0.1439	103	0.1237	0.0202

that influence the activities of companies and may therefore be unable to clearly separate the effect attributable to dual holders. On the other hand, a shorter window may include too few observations.

Table 2.11 displays our results for the difference-in-differences regression on our matched sample. In the first column we use only the three variables Post, Treat and the interaction term thereof, plus a constant. We add the control variables used in our baseline regression to the second column. In the third column we use all control variables, plus time and industry fixed effects. The interaction term is positive and statistically significant for all three regressions, indicating that firms increase their CSR activity level as a result of an exogenous shock creating a dual holding position.

In unreported analyses, we examine whether confounding effects during the merger year drive our results and hence drop the corresponding year. The results from dropping the event year are in line with the findings displayed in Table 2.11. In addition, to further ensure the robustness of our results, we extend the time window for the difference-in-differences regression and find similar results when using a ten- and twelve-year window around the merger event.

Table 2.11: This table reports the results of the difference-in-differences estimation of equation 2.2 using the propensity score matched sample. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Hyp.	Exp.	Asset4 ESG	Asset4 ESG	Asset4 ESG
Post			4.034***	3.747***	−0.358
			(0.991)	(1.082)	(1.179)
Post*Treat	1	+	2.298*	2.385*	2.439*
			(1.384)	(1.371)	(1.372)
Treat			−0.722	−2.061	−1.499
			(2.750)	(2.174)	(1.972)
Leverage				−5.193	−4.222
				(4.833)	(4.931)
Profitability				40.983***	27.163***
				(10.397)	(10.029)
Advertising expense				87.961**	88.489*
				(41.859)	(49.457)
R&D expenditure				82.953***	77.873***
				(26.944)	(26.115)
Capital expenditure				30.746*	29.941*
				(15.947)	(15.313)
ln(At)				6.991***	9.498***
				(0.815)	(0.694)
E-Index				−1.770**	−2.137***
				(0.748)	(0.571)
Blockholding				2.244	0.796
				(5.988)	(5.537)
Constant			57.463***	−9.807	−41.153***
			(2.329)	(8.935)	(9.140)
Observations			1,448	1,448	1,448
Adjusted R-squared			0.023	0.379	0.578
Industry FE			NO	NO	YES
Year FE			NO	NO	YES

2.4.4   Additional Analysis

Corporate governance may be an important channel for our results. As dual holders have greater monitoring incentives, they enhance overall corporate governance within a firm, which creates a shift in a firms' CSR activities. Li (2018) underlines the role that corporate governance plays in shaping a company's CSR activities. While we have already established a positive link between dual holders and better corporate governance, measured by the Asset4 Governance subscore, we expect this relationship to be stronger if the firm exhibits relatively weak corporate governance. We thus calculate the median Asset4 Governance value and assign a binary variable Low Governance the value of one if a firm has a below median Asset4 Governance score, and zero otherwise. To test whether weakly governed dual holding firms see a greater increase, we create an interaction term between the Low Governance variable and the binary variable measuring the presence of dual holders and use it in an OLS regression. Table 2.12 displays the results. As the interaction term is statistically significant and positive, we reason that the relationship between governance activities and dual holdings is more pronounced if the firms' corporate governance is weak.

2.5   Conclusion

This study analyses how agency conflicts between debtholders and shareholders influence companies' CSR activity level. We show that, on average, the presence of dual holders leads to a higher CSR performance score and that this effect is stronger the more unique dual holders are present and the greater the average equity stake of all dual holders present in a company. Our results are consistent in sign across the different subscores of CSR activity and especially pronounced for the environmental and social pillars of CSR. The enhancement in corporate governance in dual-held firms is stronger if the firm has a low corporate governance score. Using institutional mergers, we relieve potential endogeneity concerns in a difference-in-differences regression. We define treated firms as firms in which previously separate creditors and shareholders merge to form an exogenously created dual holding position. Our results show that treated firms exhibit a stronger increase in CSR activity than the propensity score matched control sample, that is, firms which have never had an institutional dual holder with similar firm characteristics as the treated firms. As indicated by prior literature, we find that dual holders internalise agency conflicts between debtholders and shareholders and that this reduction is positively associated with CSR

Table 2.12: This table reports the results of an OLS estimation, regressing the overall Asset4 Governance score on a binary dual holding variable, which equals one if a firm has a dual holder in a given year, and zero otherwise and the respective controls. Low Governance depicts a binary variable, which equals one if a firm has a below median Asset4 ESG Governance, and zero otherwise. The interaction term Dual Holding∗Low Governance depicts the additional marginal increase in the Asset4 Governance score if a dual-held firm exhibits weak governance, compared to a dual-held firm with strong governance. We use the Fama and French 48-industry classification for the industry fixed effects. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors clustered at the firm level are reported in parentheses below each coefficient.

Variables	Asset4 Governance	Asset4 Governance	Asset4 Governance
Dual Holding	1.476***	1.047***	0.469*
	(0.261)	(0.253)	(0.271)
Dual Holding∗Low Governance	2.791***	2.058***	1.387**
	(0.739)	(0.708)	(0.678)
Low Governance	−28.741***	−26.796***	−25.282***
	(0.430)	(0.423)	(0.433)
Leverage		0.389	0.278
		(0.947)	(0.964)
Profitability		12.459***	8.010***
		(1.752)	(1.867)
Advertising expense		−0.346	−6.953
		(10.220)	(13.162)
R&D expenditure		11.475***	9.200**
		(2.886)	(4.250)
Capital expenditure		7.436**	4.006
		(3.216)	(4.587)
ln(At)		1.640***	1.941***
		(0.120)	(0.134)
E-Index		0.379*	0.186
		(0.193)	(0.216)
Blockholding		−0.484	1.404
		(1.342)	(1.492)
Constant	85.570***	68.091***	45.122***
	(0.190)	(1.463)	(10.337)
Observations	11,391	11,391	11,391
Adjusted R-squared	0.618	0.635	0.649
Industry FE	NO	NO	YES
Year FE	NO	NO	YES

performance. Our study enriches the existing literature by analysing the relationship between creditor shareholder conflicts and CSR.

The results are important for both practitioners and researchers as they show how modern financial institutions with their complex structure shape and influence the CSR activities of their investments. In particular, we show how the differences between debt and equity investors, with their varying access to a firm's profits or influence on managerial decision making, influences CSR performance. Dual holders, i.e., institutional investors that hold both debt and equity securities, are a unique opportunity to study how agency conflicts between creditors and shareholders, and a reduction therein, influence companies to step up their CSR efforts. As CSR increasingly attracts the attention of institutional investors, it is important for practitioners to acknowledge how modern financial institutions, in their role as investors, are themselves one of the driving forces behind firms that increase their efforts in this field.

Future research could shed light on the channels through which dual holders influence CSR performance. As shown by Chu (2018), dual holding companies pay out significantly lower dividends. Some of the excess cash from retained dividend payouts could be spent on CSR activities, presenting a channel for our results. Although we follow previous literature to control for indicators that have been found to be determinants of CSR activity in addition to time and industry fixed effects, we cannot claim to have included all possible variables of importance. One example may be unobservable CEO characteristics. Another potential avenue for future research is to examine how information dispersion among dual holders influences the effect on CSR activities. While we show that both commercial and non-commercial banking dual holders are positively related with CSR, a more granular differentiation of dual holders by investor type, e.g., bank, insurance or mutual fund could help to further differentiate the diverging views these institutions have of CSR.

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Appendix 2.A

Table 2.13: This table reports descriptions of the dependent and independent variables used in our analysis.

Variables	Definition
Dependent variables	
Asset4 ESG$_{i,t}$	The total Asset4 score in year t for firm i
Asset4 Environmental$_{i,t}$	The Asset4 environmental subscore in year t for firm i
Asset4 Social$_{i,t}$	The Asset4 social subscore in year t for firm i
Asset4 Governance$_{i,t}$	The Asset4 governance subscore in year t for firm i
Dual Holding variables	
Dual Holding$_{i,t}$	Dummy variable, equal to 1 if firm i has at least one dual holder in year t, 0 otherwise
Number of Dual Holders$_{i,t}$	Natural logarithm of one plus the sum of all distinct dual holders of firm i in year t
Equity Share of Dual Holders$_{i,t}$	Natural logarithm of one plus the sum of the average equity stake in year t by all dual holders of firm i
Control variables	
Leverage$_{i,t}$	Long term debt divided by total assets at the beginning of the year for firm i in year t
Profitability$_{i,t}$	Earnings (before extra items) divided by total assets at the beginning of the year for firm i in year t
Advertising expense$_{i,t}$	Advertising expense divided by total assets at the beginning of the year for firm i in year t
R&D expenditure$_{i,t}$	R&D expenditure divided by total assets at the beginning of the year for firm i in year t
Capital expenditure$_{i,t}$	Capital expenditure divided by total assets at the beginning of the year for firm i in year t
ln(At)$_{i,t}$	Log of total assets for firm i in year t
E-Index$_{i,t}$	Entrenchment index for firm i in year t
Blockholding$_{i,t}$	Sum of institutional ownership greater than 5% for firm i in year t
ln(MCap)$_{i,t}$	Log of market capitalization for firm i in year t
ln(Sales)$_{i,t}$	Log of total sales for firm i in year t

Table 2.14: This table shows the identification strategy for our difference-in-differences regression. Institution X and Y are institutional investors that separately hold a large and diversified portfolio of different debt and equity securities. If institution X acquires institution Y (or vice versa) to create institution XY, their two portfolios are combined. In our analysis we consider firm B as a treated firm as the dual holding position of investor XY only appeared due to the exogenous merger between the two investors X and Y. Firm A is not considered a treated firm as institution X was a dual holder in firm A before the merger. We identify the control firm for firm B based on different firm characteristics one year prior to the merger between institution X and Y among all firms that never had a dual holder during our entire sample period.

Institution X		Institution Y
Share A		Share C
Share B		Loan B
Loan A		Loan D

	Institution XY	
	Share A	
	Share B	
	Share C	
	Loan A	
	Loan B	
	Loan D	

Chapter 3

The Capital Market Impact of Blackrock's Thermal Coal Divestment Announcement

Alexander Bassen, Thomas Kaspereit, Daniel Buchholz

3.1 Introduction

"And because capital markets pull future risk forward, we will see changes in capital allocation more quickly than we see changes to the climate itself."

— Larry Fink*, CEO of Blackrock*

In recent years, climate change and the risks of rising global temperatures have gained increasing attention of both civil society and capital market participants. Coal combustion, in particular, is facing great headwind as one of the major contributors to global warming (IEA, 2019). Thus, companies engaged in coal mining or which use coal as a production input are engaged in a constant battle to maintain their social licence to operate. Various asset owners such as insurers (Allianz, 2018) or sovereign wealth funds (Carrington, 2015) are decreasing their exposure to coal-based business models. One of the latest investors to address the importance of climate change risks in its investment strategy is Blackrock, the largest asset manager in the world. In its annual letter to company managers and clients,[1] published on January 14, 2020, it acknowledged these risks and announced it would increase its range of sustainability themed products. What gained most public attention was the company's announcement that it would withdraw from all active investments in thermal coal producers within one year. Thermal coal is mainly used for power production, unlike metallurgical coal, which is used for steel production. In our study we analyse how this announcement affected listed coal companies, that is, companies with coal-related business activities, as well as the divesting institution itself. Using event study methodology, we examine the abnormal returns over an event window around the publication of the letter.

In a survey by Krueger et al. (2020) the authors find that engagement, such as private discussions with executives or proposals at annual meetings, is the most frequently used method of institutional investors to address climate risks. Dimson et al. (2015) and Hoepner et al. (2016) provide evidence that engagement fosters stock returns and reduces downside risk. Divestment offers an alternative channel for institutional investors to address climate risks. Our study is the first to examine a divestment announcement made by a publicly listed asset manager that implicitly argued that engagement is insufficient to address climate risks for certain sectors such as thermal coal. We complement prior research by Dordi and Weber (2019), who analyse the impact of various fossil fuel divestment announcements. In their sample the announcements were made by university endowments, campaigns, or sovereign pension and wealth funds, which are closely moni-

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[1]Available at: https://www.blackrock.com/corporate/investor-relations/blackrock-client-letter

tored by the general public. We propose that listed institutional investors have different incentives to divest from certain business activities than private asset owners, due to both fiduciary duty and self-serving interests. Furthermore, the importance of sustainability in finance potentially increased substantially after the Paris agreement was signed in 2015, shortly after the sample of Dordi and Weber (2019) ended. In addition to the findings of the event study, our study is the first to analyse the development of equity holdings of a divesting institution in potentially affected stocks. As the publication date of the letter is self-selected, we hypothesize that Blackrock adjusted its holdings in thermal coal producers accordingly to shield its clients from the negative backlash of the announcement.

3.2   Literature Review and Hypothesis Development

The consequences of divestment were first discussed in the context of divestment announcements due to political and public pressure. During South Africa's apartheid regime, a considerable trend emerged towards divesting from companies doing business with South Africa. Event studies by Meznar et al. (1994), Ferris and Wright (1997), and Meznar et al. (1998) indicate that companies announcing a divestment from their South African business faced negative stock price reaction during the first few years of the divestment movement. This changed after the Rangel Amendment, which prohibited American companies from claiming tax credits for taxes paid in South Africa, after which the negative reaction disappeared.

Event studies have also been conducted in the context of environmental risks. Several studies analyse how the nuclear accident in Fukushima, resulting from a tsunami in March 2011, affected nuclear power companies as many countries and capital market participants updated their risk assessment of nuclear energy (Basse Mama & Bassen, 2013; Lopatta & Kaspereit, 2014). The studies find that nuclear power plant operators around the world saw significantly negative returns in their share price following the accident, and that various governments' turned away from nuclear energy. With our study, we add to the literature on the capital market impacts of fossil fuel divestment as one way to address climate change risks. A recent study by Dordi and Weber (2019) analyses several divestment campaigns and the capital market reaction thereto, measured in stock returns of a portfolio of fossil fuel stocks. The authors find negative abnormal returns around the campaign events. By analogy, we expect coal companies to face negative stock market reactions after Blackrock's divestment announcement. This leads us to our first research hypothesis:

Hypothesis 4 (H4). *Coal companies exhibited significantly negative returns around Black-rock's divestment announcement.*

Hartzmark and Sussman (2019) find that mutual funds with a high sustainability rating see greater inflows compared to low sustainability rated funds. Thus, investors value sustainability efforts by their asset manager. Hunt et al. (2017) note that fossil fuel divestment announcements by large institutional investors increase awareness and could trigger other capital market participants' re-evaluation of their involvement in fossil fuels. As Blackrock's revenues depend on the fees from their assets under management, we expect the capital market to appreciate the divestment announcement. We hence propose the following hypothesis:

Hypothesis 5 (H5). *The divestment announcement created value for Blackrock's share-holders.*

We further propose that the asset manager already adjusted some of its holdings accordingly to the divestment guidelines before the announcement, particularly in regard to the companies which would be prone to negative abnormal returns following the announcement. This can be justified by both self-serving arguments, as the fees for asset managers are generally calculated as a percentage of the assets under management, as well as by fiduciary responsibilities towards investors in products managed by the divestor.

Hypothesis 6 (H6). *Blackrock reduced its exposure towards negatively affected companies before the divestment announcement.*

3.3 Data and Methodology

We use the Global Coal Exit List (GCEL)[2] of the German NGO urgewald to generate our sample of affected companies. This dataset provides an extensive list of 2182 companies and their subsidiaries, along the coal supply chain and was last updated in September 2019. In a first step, we manually extract 370 public companies in 44 different countries and exclude both private and state-owned firms. We lose some observations due to insufficient stock market data. Table 3.1 gives an overview of the sample selection process. Most of the firms are headquartered in China (97), followed by the US (37) and Australia (31). Figure 3.1 displays the location of the companies in our sample. As the GCEL does not clearly distinguish between thermal and general coal mining activities, we also use a list by Caldecott et al. (2016). The list uses 2014 data and displays the worlds top

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[2]Available at: https://coalexit.org/

Table 3.1: This table reports the sample selection procedure. As stock market data was not available for every firm on every day, e.g. due to national holidays, the number of firms used in the event study varies.

		Number of unique firms
	Global Coal Exit List	2182
-	Excluding private and state-owned firms	1812
=	Identified listed firms	370
-	Insufficient stock market data	46
-	Delisted firms	2
-	Insufficient market index/factor data	4
=	Final sample	318

20 listed thermal coal mining companies whose revenue from thermal coal mining is in excess of 30%. Most companies in this list also feature on the GCEL, which supports the assumption that the revenue share from thermal coal did not change substantially since the original publication in 2014.

Blackrock's announced that it would divest from companies which generate more than 25% of their revenue from thermal coal production, i.e., mining, and that it would carefully monitor other companies which heavily rely on thermal coal as a production input. Nevertheless, as the divestor is the world's largest asset manager, managing over USD 7 trillion in assets, we expect this announcement to have had an overall effect on all companies engaging in coal-related business activities. Unlike the divestor, the GCEL uses a slightly higher threshold (30%) that incorporates all coal-related business activities, not only those related to thermal coal. We do not control for this as the higher threshold used by the CGEL would work against finding any support for our hypotheses.

We retrieve daily closing prices from Thomson Reuters Datastream to calculate returns $R_{i,t}$ for our sample firms and follow the event study methodology. As a return-generating process we use the 3-factor model described in Fama and French (1993). We calculate daily risk factors identified by Fama and French (1993) to capture differences in returns across market capitalization ($SMB_{i,t}$) and book-to-market ratio ($HML_{i,t}$). To calculate the factor loadings we use annual accounting data from Thomson Reuters Datastream. The portfolio formation and the calculation of market returns $R_{i,t}^M$ is calculated on a country level and includes all listed companies for which data was available, excluding the affected firms as identified by the GCEL. We define January 14, 2020 (t=0) as our event date, as the letter of the divestor was published on this date. Our event period spans the

Figure 3.1: Geographical distribution of the listed companies in our sample.
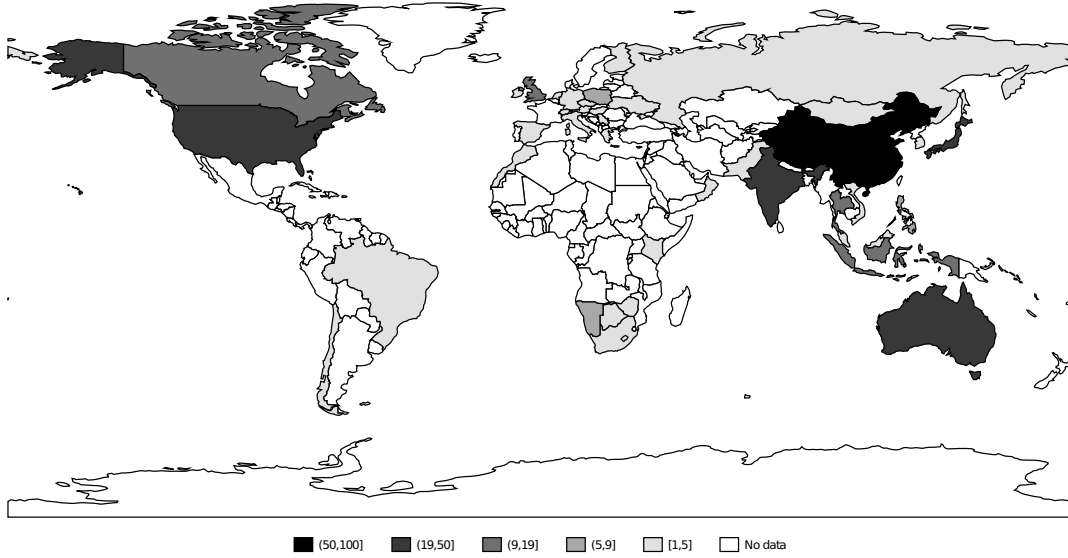
seven days centred around the event. Our estimation period spans a period of 270 trading days and ends 21 days before the event date. We use the following regression to calculate the coefficients α_i, β_i, s_i, and h_i:

$$R_{i,t} = \alpha_i + \beta_i R_{i,t}^M + s_i SMB_{i,t} + h_i HML_{i,t} + \epsilon_{i,t} \tag{3.1}$$

where $R_{i,t}$ is the observed return for firm i on day t. The abnormal return $AR_{i,t}$ is then defined as the difference between the observed return and its predicted value:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{i,t}^M + \hat{s}_i SMB_{i,t} + \hat{h}_i HML_{i,t}) \tag{3.2}$$

To aggregate the company-specific abnormal returns $AR_{i,t}$ and calculate average abnormal returns (AAR), we use the following equation:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{i,t} \tag{3.3}$$

We further calculate the cumulative average abnormal return (CAAR) defined in equation 3.4.

$$CAAR[\tau_1, \tau_2] = \sum_{t=\tau_1}^{\tau_2} AAR_t \tag{3.4}$$

Campbell et al. (2010) underline the importance of using the correct test statistics when conducting multi-country event studies. Using a simulation study they find that the rank test (Corrado, 1989) and the generalized sign test (Cowan, 1992) provide the most powerful results. We follow their advice and use the updated version of the rank test described in Corrado and Zivney (1992) and the generalized rank test proposed by Kolari and Pynnonen (2011) to address the econometric problems arising from event date clustering.

3.4   Results

Table 3.2 displays the AARs as well as the CAARs across the event period. Table 3.5 in the appendix gives an overview of the different subsamples we use. The results in the first three columns show that the divestment announcement did not affect most of our sample firms. However, there is evidence that a small subsample of companies with strong coal mining activities experience negative abnormal returns on the days following the announcement. The CAARs indicate significant negative returns around the event date for this subsample. Thus, Hypothesis 4 only finds support for the subsamples of companies with high coal mining activities.

We further analyse our sample based on geographical characteristics in the first three columns of Table 3.3. Large thermal coal mining firms headquartered in the US were especially affected by the announcement as they experienced, on average, an abnormal decrease in share price of 2.28% on the day after the announcement. This effect is not observed when considering all firms headquartered in one of the G7 member states. To acknowledge the possibility that the response to the announcement was anticipated or that the importance of the publication was recognized late by capital market participants, we analyse the CAARs. Again, large thermal coal mining companies headquartered in the US were most affected, with an average cumulated decrease in share price of -7.52% across the whole event period and a decrease of -5.88% on the event date and the three subsequent trading days. The other firms in our sample were either unaffected or marginally positively influenced by the publication. While the results do not support Hypothesis 4 for our global sample, we show that the announcement had a considerable negative effect on large thermal coal mining companies headquartered in the US. These results are consistent with the fact that Blackrock only divested from mining companies and not from firms doing business along other parts of the coal supply chain.

To analyse whether the capital market considered the divestment announcement as creating positive value for Blackrock, we extract data for the divestor in a similar fashion

Table 3.2: This table reports the results of average abnormal returns (Panel A) and the cumulative average abnormal returns (Panel B) for different time periods. Significance at the 1%, 5%, and 10% levels is indicated by three-, two-, and one-letter characters, respectively. The lower case c's indicate significance according to the Corrado and Zivney (1992) rank test. For cumulative average abnormal returns we apply the aggregation formula as defined in Cowan (1992). The upper case k's in Panel A indicate significance according to test proposed by Kolari and Pynnönen (2010). The upper case g's in Panel B indicate significance according to the G rank test as proposed by Kolari and Pynnonen (2011). As stock market data was not available for every firm on every day during the event period, we state three indicators on the number of firms included within each subsample. Table 3.5 in the appendix provides descriptions of the subsamples used.

Panel A: AAR

t	World	Coal revenue > 25%	Large miner
−3	−0.0028	−0.0048	−0.0046
−2	−0.0008	−0.0019	−0.0004
−1	0.0031	0.0000	0.0065
0	0.0036	0.0041	0.0065
+1	−0.0004	0.0008	−0.0099$_c^b$
+2	0.0000	0.0011	−0.0030
+3	−0.0016	−0.0012	−0.0101
Max N	308	114	18
Mean N	306.00	111.57	17.71
Min N	301	109	17

Panel B: CAAR

| t	World	Thermal coal revenue > 25%	Large miner
[−1;+1]	0.0060	0.0053	0.0035
[−3;+3]	0.0001	−0.0022	−0.0148$_c$
[0;+2]	0.0020^g	0.0057^{gg}	−0.0062
[0;+3]	0.0007	0.0045	−0.0163$_c$

Table 3.3: This table reports the results of average abnormal returns (Panel A) and the cumulative average abnormal returns (Panel B) for different time periods of geographical subsamples. Significance at the 1%, 5%, and 10% levels is indicated by three-, two-, and one-letter characters, respectively. The lower case c's indicate significance according to the Corrado and Zivney (1992) rank test. For cumulative average abnormal returns we apply the aggregation formula as defined in Cowan (1992). The upper case k's in Panel A indicate significance according to test proposed by Kolari and Pynnönen (2010). The upper case g's in Panel B indicate significance according to the G rank test as proposed by Kolari and Pynnonen (2011). As stock market data was not available for every firm on every day during the event period, we state three indicators on the number of firms included within each subsample. Table 3.5 in the appendix provides descriptions of the subsamples used. Due to constraints induced by singularity we only report the CDA test results in the last column, indicated by asterisks for the same level of significance.

Panel A: AAR

t	G7	US HQ	Large US miner	Divestor
-3	0.0004	0.0041	-0.0082	0.0050
-2	0.0003	-0.0012	-0.0238_{cc}^{kk}	0.0037
-1	0.0042	0.0071	0.0155	0.0120*
0	0.0058	0.0059	-0.0080	-0.0096
$+1$	0.0019_c	0.0054	-0.0228	0.0224***
$+2$	0.0068_{cc}^{k}	0.0076	-0.0060	-0.0024
$+3$	-0.0041	-0.0063	-0.0220_c	-0.0056
Max N	79	34	4	1
Mean N	78.43	33.86	4	1
Min N	78	33	4	1

Panel B: CAAR

t	G7	US HQ	Large US miner	Divestor
$[-1;+1]$	0.0121_{cc}^{gg}	0.0184_{cc}^{g}	-0.0152	0.0248**
$[-3;+3]$	0.0144_{cc}	0.0204_{cc}	-0.0752_{cc}^{gg}	0.0255
$[0;+2]$	0.0146_{ccc}^{ggg}	0.0190_{cc}^{gg}	-0.0368^{gg}	0.0104
$[0;+3]$	0.0105_{cc}^{ggg}	0.0127_{c}^{g}	-0.0588_{cc}^{gg}	0.0048

to the approach described above for the public companies included in the GCEL. The results are in the last column of Table 3.3. On the day following the event, the divestor experienced a 2.24% abnormal increase in its share price, indicating that the capital market assumed the announcement to increase overall company value. We thus find support for Hypothesis 5. In untabulated analysis we use the generalized sign test developed by Cowan (1992) and the crude dependence adjustment (CDA) test developed by Brown and Warner (1980) and find relatively similar results for Hypotheses 4 and 5, underlining a significant decrease in share prices for large thermal coal mining companies headquartered in the US following the announcement.

As the capital market reaction was especially strong for these companies, we analyse whether the divesting asset manager shifted its portfolio holdings already before the divestment announcement. To that end, we analyse 13F filings, which summarise all equity holdings in US stocks, that all institutional investment managers with over USD 100 million in US equity assets under management have to submit on a quarterly basis to the Securities and Exchange Commission. We retrieve the filings for the period December 2017 to March 2020 and match them with our dataset. We are able to identify 30 US companies from the GCEL in which Blackrock holds an equity claim during the three-year period.

Figure 3.2: These figures display the median cumulative logarithmic changes in the number of shares held by the divestor for different subsamples of our dataset. The continuous lines represent the changes for firms which breach the revenue threshold set by the divestor (Panel A) and which are considered a large thermal coal miner (Panel B), while the dashed lines represent the changes for the remaining firms, respectively.
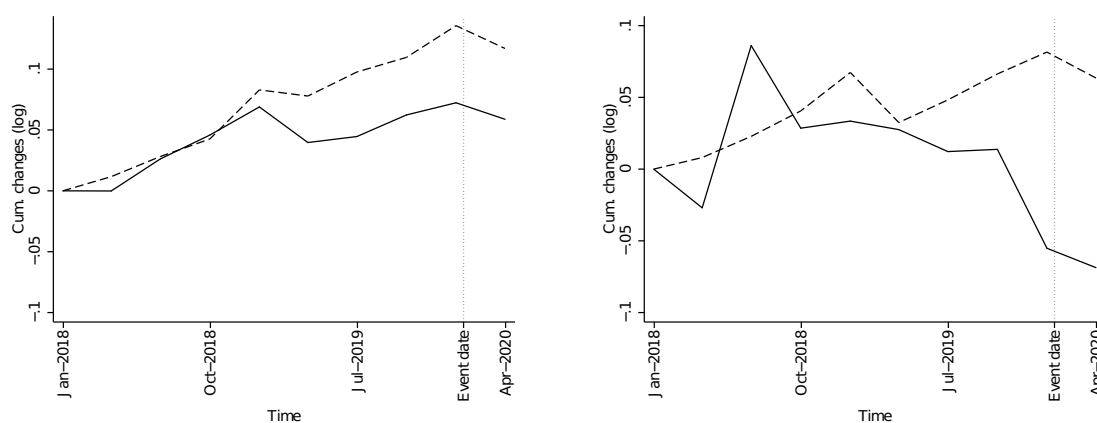
Panel A: Coal revenue   Panel B: Large miner

Figure 3.2 shows the development of Blackrock's equity holdings and plots the median cumulative changes in logarithmic notation. Especially Panel B displays the varying development across firms which are considered large thermal coal miners in our sample, which see a continuous decrease, and those which do not. To empirically analyse the graphical findings we use two-tailed t-tests. Table 3.4 shows the average quarterly changes that the divestor made in regard to two different subsamples within our data. While the differences between firms above and below the thermal coal revenue threshold are generally not statistically significant for frequently applied levels, the table shows statistical significance in form of a reduction in large US mining companies, especially in the quarter before the divestment announcement. As these were the stocks most negatively affected by the announcement, the results provide evidence that the divestor protected value for its clients by reducing its exposure to the companies which were expected to suffer negative consequences after the divestment announcement. These results support Hypothesis 6.

3.5 Conclusion

We analyse how the announcement of thermal coal divestment influences the share prices of a global sample of companies engaged in business activities related to coal. While we find that most companies experienced no abnormal returns during the event period, we show that a small subset of firms, namely large mining companies headquartered in the US, exhibited a strong drop in share prices after the announcement. Furthermore, we show that the capital market anticipated that the divestment would create value for the divestor and that the divestor protected value for its clients by decreasing its exposure towards the negatively affected companies before the announcement.

Divestment can be seen as a rapid and easy alteration to the "business-as-usual" investment policy in a world beset by climate change. Our results show that this alteration does not undermine the fiduciary duty of asset managers towards their clients. Moreover, divestment may help to reinforce the environmental stance of institutional investors, which can be a competitive advantage and is also underlined by our results.

Further research could analyse whether country or ownership characteristics mitigate the observed effects and whether the equity stake the divestor held in our sample firms may have amplified the capital market's reaction. Another promising avenue for future research are the carbon-related consequences of divestment for the divestor, the companies in question, and the overall economy.

Table 3.4: This table reports the average quarterly changes in the number of shares as reported in the divestors' quarterly 13F filings for two subsamples. To analyse whether the development between the quarterly subsamples, i.e. firms with more or less than 25% revenue from thermal coal mining, varies we perform two-sided t-tests.

Group	Mar-2018	Jun-2018	Sep-2018	Dec-2018	Mar-2019	Jun-2019	Sep-2019	Dec-2019	Mar-2020
Coal revenue < 25%	−0.92%	0.28%	2.05%	3.54%	−0.63%	9.27%	3.65%	2.74%	−1.68%
Coal revenue > 25%	2.60%	5.98%	1.81%	2.03%	−2.69%	1.98%	1.59%	0.53%	−1.53%
P-value of difference	0.3966	0.2139	0.8835	0.2958	0.2583	0.232	0.3837	0.1285	0.9494
No large miner	1.70%	3.01%	2.16%	2.83%	−2.28%	4.88%	2.59%	1.81%	−1.34%
Large miner	0.68%	15.52%	−0.55%	−0.82%	−0.23%	−2.26%	−1.21%	−4.34%	−3.73%
P-value of difference	0.8669	0.0566	0.2361	0.0797	0.4635	0.4466	0.2923	0.0035	0.4834

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Appendix 3.A

Table 3.5: This table reports descriptions of the subsamples used in our analysis.

Name	Description
World	Whole dataset
Coal revenue > 25%	Companies which breach Blackrock's thermal coal revenue threshold (>25% revenue from thermal coal)
Large miner	Top 30 mining companies according to Caldecott et al. (2016) (>30% revenue from thermal coal)
G7	Companies headquartered in one of the seven largest advanced economies as defined by the IMF
US HQ	Companies headquartered in the US
Large US miner	Top 30 mining companies according to Caldecott et al. (2016) (>30% revenue from thermal coal) headquartered in the US

Chapter 4

The Boundaries of Corporate Mens Rea: The Case of Human Rights Litigation

Daniel Buchholz

4.1   Introduction

This study aims to deepen our understanding of when investors do (not) assume a corporate mens rea in the case of corporate social irresponsibility (CSI). Specifically, we investigate investors' reactions to corporate human rights litigation cases and how this reaction is influenced by a) a firm's overall commitment to corporate social responsibility (CSR) and b) a firm's human rights policy as a specific precautionary CSR measure.

In the case of corporate misconduct, shareholders' assessment of the company's engagement and eventual guilt is crucial. Godfrey (2005) theorizes that shareholders use a doctrine of corporate mens rea for this assessment. In civil and criminal law, mens rea (literally, "guilty mind") refers to the state of mind in which a wrongful act was committed. Khanna (1999) defines three categories for this "guilty mind" condition in the case of corporate mens rea: intent, knowledge, and recklessness. We know from prior studies that shareholders' reaction to corporate misconduct varies (Barnett, 2014; Lange & Washburn, 2012). Nevertheless, we know relatively little about the distinct circumstances that influence this assessment and subsequently lead to capital market reactions. Noteworthy exceptions include Godfrey et al. (2009) and Christensen (2016), who show that certain aspects of CSR, such as institutional CSR activities or publishing corporate accountability reports, might have an insurance-like effect in case of adverse events (e.g., less negative reaction to a negative event if investors perceive a firm as a good CSR performer).

We use human rights litigation cases as CSI-related events as they provide an ideal setting to assess which factors influence the perception of corporate mens rea. We can tie each human rights lawsuit to a specific firm, as firms are listed as defendants at court. Human rights lawsuits are complex in nature (Olsen et al., 2021). From the outside, corporate involvement or intent is frequently unratable without extensive analysis (Schrempf-Stirling & Wettstein, 2017). Nevertheless, human rights policies provide an easy way for companies to demonstrate the commitment they have made to human rights (Olsen et al., 2021). Hence, we argue that human rights litigation cases and human rights policies are ideal to exemplify our theoretical arguments and to empirically test whether specific proactive measures (i.e., human rights policies) allow investors to assume a lack of corporate mens rea in case of a related CSI event (i.e., human rights lawsuit).

At the same time, human rights are a particularly important area of what is termed ESG (enviromental, social, and governance). Compliance with human rights is at the center of corporate responsibilities (Fasterling & Demuijnck, 2013) due to their standing as one of the most fundamental moral rights. Additionally, human rights are essential for regulators (Cousins et al., 2020) and are a frequent subject of scholarly research (Schrempf-

Stirling & van Buren, 2017). Companies are increasingly held accountable for human rights violations in their business operations and along their supply chains (Schrempf-Stirling & Wettstein, 2017). One tragic example of corporate involvement in the violation of human rights is the case of Anvil Mining in the Democratic Republic of the Congo in 2004, one of our sample lawsuits. The plaintiffs asserted that Congolese troops used logistical assistance provided by the multinational mining firm to conduct executions, rape, and torture in a village.[1] Other cases, while less martial, are of equal importance. A dam collapse in Brazil resulted in at least 200 deaths and led to serious allegations of workplace safety negligence against the mining firms who owned the dam (Primo et al., 2021).

This increased presence of human rights in the corporate environment is accompanied by a scholarly debate on the fiduciary duty of companies regarding human rights (Scherer & Palazzo, 2011), as well as actions by other stakeholders such as international organizations (ILO, 1998; United Nations, 2011). Our study analyzes how the capital market reacts to litigation cases where a company faces accusations of human rights breaches.[2] In general, human rights are value-relevant for investors, as their abuse and subsequent litigation cases might generate adverse effects for a firm's reputation or affect employees or other stakeholders (James & Wooten, 2006). Additionally, they can lead to consumer boycotts (John & Klein, 2003), decreasing future revenues. Hence, human rights litigation cases might play an important role in a firm's disclosure behavior (e.g., building provisions into the financial statement or discussing litigation as a risk factor in the risk statement). Therefore, we check companies' annual reports to look for provisions built for compensation claims postulated in the lawsuit filing and other related disclosure. We find that only one of 16 defendants in the lawsuits with the highest amount requested as compensation built any provision for the lawsuit; most other firms do not even discuss the lawsuit in their financial statements. This indicates that the direct financial costs of the lawsuit are not material to their financial bottom line and that investors' reactions to human rights lawsuits are likely driven by other contextual factors.

In an initial event study analysis, we find, on average, a somewhat negative capital market reaction to these litigation cases. Then, we analyze how CSR activities influence this reaction. We find that companies with superior CSR performance suffer a larger drop in shareholder value, whereas companies with a human rights policy in place benefit from a smaller negative capital market reaction. Furthermore, we shed light on the moderating

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[1]See McBeth (2008) for a detailed discussion of this case.

[2]For an overview of existing literature on the relationship between business, CSR, and human rights, see the work by Schrempf-Stirling and van Buren (2017).

role of media attention for the perception of corporate mens rea. We find that press coverage in financial news outlets reinforces the negative effect of extensive ESG activities and nullifies the positive impact of a human rights policy. We argue that more intense coverage and more numerous critical news articles in the financial press make it harder for companies to argue against corporate mens rea. At the same time, articles in the general media do not influence the stock-price reaction, suggesting that significant topic-specific expertise is needed to influence shareholder perceptions of corporate mens rea.

Our contribution is twofold. First, our study adds to the growing stream of research dealing with the role of CSR in the case of corporate misconduct and, more specifically, to CSR literature on corporate mens rea. We address the call for more research on CSR and litigation by Barnett et al. (2018). Applying expectancy violations theory (Burgoon, 1978), we posit that an allegation of corporate misconduct (such as a human rights litigation case) signals that corporate CSR statements are decoupled from actual CSR practices. We provide evidence that the consequences of corporate human rights misconduct are worse for firms with higher CSR performance calling into question a general "insurance effect" of CSR in the event of CSI.

Second, we add to the literature on the effects of human rights policies as a specific precautionary CSR measure. Our findings suggest the existence of an insurance-like effect for specific elements of CSR that are particularly relevant for the CSI event in question, such as a human rights policy in the case of a human rights litigation case. Building on Godfrey (2005) and his mens rea framework, we theorize that a specific insurance-like effect of human rights policies might exist. Specifically, such policies might allow shareholders to assume that the event is due to managerial ineptitude rather than malevolence (Godfrey, 2005).[3] This argument is also in line with results by Olsen et al. (2021), who find that high-quality human rights policies reduce the likelihood of human rights abuses in the long term. Yet, we also show that such a buffer function depends on there being no extensive coverage by the financial press, highlighting the monitoring role of the financial press.

Our research has significant practical implications for strategic management. Our results imply that generally good CSR performance is not sufficient to shelter a company from the consequences of adverse events but rather amplifies them. Investors might be afraid that similar litigation cases might occur for other CSR areas, too. On the contrary, we show that firms that specifically and proactively address CSR sub-issues (e.g., having a human rights policy) protect their shareholder value in the case of a CSI-related litigation case. Hence, we urge companies to implement a human rights policy to a) proactively

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[3]See section 4.A of the online appendix for two examples of human rights policies of our sample firms.

manage the risks of human rights litigation and b) shield themselves from more negative investor reactions if a human rights litigation case still occurs.

We proceed as follows. The next section provides our hypothesis development. Section 4.3 shows our sample selection process and presents the event study results. We provide and discuss the results of the cross-sectional analysis in section 4.4. Section 4.5 concludes.

4.2   Hypothesis Development

A significant body of literature investigates the consequences of corporate litigation linked to CSI for shareholder value (Fauser & Utz, 2021; Godfrey et al., 2009; Koh et al., 2014). Bhagat et al. (1998) provide an early analysis of the outcomes of corporate litigation cases in general. Their results show that the share price of firms defending litigation cases drops by 0.97 percent on average on the day of the lawsuit filing. In the context of CSI, Hirsh and Cha (2015) analyze employment discrimination lawsuits and find evidence for an immediate drop in a company's share price following the filing of such lawsuits. Overall, the existing literature suggests that investors generally perceive the filing of a litigation case against the company as value-decreasing, independent of the subject of the lawsuit.[4]

Following a case of CSI, various factors influence shareholders' reactions, such as attribution of irresponsibility or the attention a case receives (Barnett, 2014; Lange & Washburn, 2012). A particularly important aspect that shareholders consider when they assess CSI is a company's mens rea. Adapting the principle of mens rea from common law and legal research more generally, Godfrey (2005) argues that an immoral act is not enough to establish an offense, but that it also needs to be committed in a bad state of mind. Hence, investors likely evaluate firms' actions following an adverse event using a mens rea condition. Accordingly, shareholders will look for signs that the adverse event results from at least one of the three categories identified by Khanna (1999): intent, knowledge, and recklessness.

In order to assess a human rights litigation case, shareholders likely consider a firm's CSR performance, given that a firm's (disclosed) CSR performance influenced the formation of their ex-ante opinion about that firm (i.e., good/bad CSR performer with low/high CSR litigation risk). Thus, our first hypothesis considers the role of CSR performance before the lawsuit. We apply the expectancy violation theory first proposed by Burgoon (1978) and posit that filing a human rights litigation case signals to investors that actual corporate CSR practices might deviate from disclosed CSR statements, as implied

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[4]For more details, refer to the studies by C. Liu (2021) or Borelli-Kjaer et al. (2021).

by high CSR ratings. Burgoon and Le Poire (1993) argue that violations of expected behavior, also called disconfirmation, lead to evaluations that are more negative than in cases where expectations and subsequent behavior align. Some studies have applied this notion to investors' capital market reactions. Nardella et al. (2020) show that investors react negatively if firms that were previously perceived as acting responsibly are convicted of corporate misconduct. In a similar vein, Zachary et al. (2023) find that firms that over-invested in CSR see a decline in shareholder value following product recalls. C. Liu et al. (2020) analyze the consequences of environmental lawsuits filed against public companies. Their results show that firms with strong CSR performance see a more substantial decrease in their share price following the initiation of an environmental lawsuit and argue that this decrease is due to investors detecting the gap between perceived CSR reputation and actual environmental misconduct. Accordingly, investors might assume that a firm's actual CSR performance is worse than their prior disclosures would suggest (i.e., decoupling), and investors might be more likely to assume corporate mens rea. Hence, we state our first hypothesis as follows:

Hypothesis 7 (H7). *A firm's ESG performance negatively affects the capital market reaction around human rights litigation cases.*

C.-M. Chen and Delmas (2011) argue that the concept of CSR covers a broad range of activities across various fields, making it difficult for shareholders to assess a firm's commitment to a sub-issue of CSR within CSR performance overall. Moreover, Godfrey et al. (2009) point out that shareholders likely evaluate a firm's CSR activities for varying levels of granularity and different aspects of CSR. They argue that, in the case of CSI, CSR targeted at secondary stakeholders provides an advantage over CSR aimed at primary stakeholders. The latter is seen as a self-serving way to cater to primary stakeholders, while the former is seen as voluntary good deeds not directly aimed at profit-making, thereby producing moral capital. This moral capital buffers the consequences of adverse events. We extend their view by arguing that shareholders likely also assess the relevance of specific CSR measures in the event of a CSI incident.

Companies, especially those with a high risk of issues related to human rights, might invest in a human rights policy as a means of managing risk, and as a proactive signal that they perceive human rights as a crucial issue (Waddock et al., 2002), which investors might reward. In line with this, Cousins et al. (2020) analyze the impact of modern slavery regulation in the United Kingdom on shareholder wealth and find that policies on critical countries or forced labor are positively related to shareholder wealth during events associated with the introduction of the UK Modern Slavery Act. Schrempf-Stirling

and Wettstein (2017) underline the importance of human rights policies when assessing corporate mens rea. In a review of human rights litigation cases, they find that more than two-thirds of the 41 companies they analyzed introduced human rights policies shortly after legal proceedings related to human rights, indicating changes in their behavior in the area of the lawsuit. When assessing shareholders' reaction to an adverse event, we presume that they look for the existence of such a policy as evidence for the lack of corporate mens rea, and state our second hypothesis as follows:

Hypothesis 8 (H8). *The existence of a human rights policy positively influences the capital market reaction for firms subject to human rights litigation cases.*

4.3   Event Study of Human Rights Litigation Cases

We obtain data on human rights litigation cases from the Lawsuits Database of the Business & Human Rights Resource Centre[5], which provides details on the timeline, content, and severity of corporate human rights litigation cases. We exclude all private firms and firms with no financial information on Refinitiv Datastream. Our event study sample consists of 112 different lawsuits concerning 107 firms from 22 countries. Section 4.A of the online appendix describes our sample selection procedure and event study methodology in detail.

In the event study, we examine three different event windows ((-1;1), (-3;3), and (0;2)) with t=0 being the event date.[6] Table 4.1 displays the cumulative abnormal returns (CAR) for three different event dates: the date of the incident (Column 1)[7], the date of filing (Column 2), and the date of judgment (Column 3). When we define the event window around the event date itself and include day(s) before the event date (i.e., (-1;1) and (-3;3)), all but one of the CARs are insignificant no matter which of the three event dates we consider. This suggests that it is unlikely that information around human rights litigation cases already (informally) spread before the event date to a meaningful extent. However, for the event window starting with the event date (i.e., (0;2)), we find a small but statistically significant negative market reaction in the days following a lawsuit filing (Column 2) (p-values: .09 and .03, respectively, for the tests by Cowan (1992) and Kolari and Pynnonen (2011)). Then again, for the incident date (Column 1), we observe

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[5]Available at: https://www.business-humanrights.org/en/from-us/lawsuits-database/

[6]Some event windows start before the event date, as market participants might have anticipated the event, or some information might have spread before the event date.

[7]Only some lawsuits state an incident date, e.g., the dam collapse mentioned in the introduction. For the majority, no date was available as the incident occurred over a particular period or reflected certain firm behavior in general.

a substantial decline in stock prices, of, on average, 3.35 percent (p-values: .46 and .04). Lastly, Column 3 displays a slight negative stock price reaction after the judgment date (i.e., for the two days following the event date, we obtain p-values of .21 and .12). Overall, our results show, on average, some evidence of a negative capital market reaction following human rights litigation cases.

Although we find relatively low levels of statistical significance (which we attribute to the relatively small sample size), we argue that the effect sizes we observe are economically meaningful, compared to other adverse firm events. For instance, C. Liu et al. (2020) find an abnormal negative market return of -2 percent for firms in the two days following an environmental lawsuit, on average leading to a decline in market capitalization of around $110 million. Our sample firms have an average market capitalization of around $196 billion, indicating an average loss of $98 million in market capitalization in the first two days after a lawsuit is filed.[8]

Table 4.1: This table reports the results of cumulative average abnormal returns for different subsamples. The columns Cowan and G Rank, respectively, indicate the p-values according to the test proposed by Cowan (1992) and the G rank test proposed by Kolari and Pynnonen (2011). CAR values in percent.

t	Date of Incident (N=23)			Date of Filing (N=162)			Date of Judgement (N=65)		
	CAR	Cowan	G Rank	CAR	Cowan	G Rank	CAR	Cowan	G Rank
(−1;1)	−2.97	.98	.19	−0.11	.21	.18	−0.15	.83	.44
(−3;3)	−1.98	.65	.83	0.08	.72	.82	−0.60	.25	.00
(0;2)	−3.35	.46	.04	−0.05	.09	.03	−0.52	.21	.12

Before we turn to the multivariate analysis, we first want to understand why the capital market reacts to human rights litigation cases only somewhat negatively. A straightforward explanation might be that these litigation cases do not directly impact a firm's financial bottom line, or that firms and their investors share a view that this is the case. We explore this explanation by analyzing the annual reports of defendant companies with the 10 highest amounts requested ($2.74 million – $5.3 billion) for compensation for the year of the respective lawsuit filing (see Table 4.8 in the online appendix for a detailed presentation of these cases).

Overall, the 10 lawsuits target 16 companies. We were able to collect 13 annual reports for the year the lawsuit was filed.[9] Of these, only seven mention the lawsuit. Even more

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[8]Given better data availability (N=162 for the filing date vs. N=65 for the judgment date and N=23 for the incident date), we only focus on the CAR around initiating a lawsuit in our subsequent multivariate analyses. To ensure our results are not sensitive to this methodological choice, we also pool all of the different event dates in a pooled analysis and find that our results remain unchanged.

[9]We were not able to retrieve the annual reports for the three lawsuits filed before the year 1999.

surprisingly, only one of the 13 companies (BHP in 2016) built a provision for the lawsuits; it was equal to $2.4 billion (which equals roughly 2% of the firm's total assets at the time). The other six companies that at least mention the lawsuit argue that its outcome is not material to their financial bottom line, or that the outcome itself is uncertain.[10] These findings underline our assumption that human rights litigation cases are complex in nature, and contextual factors other than the direct financial impact likely influence the capital market reaction to a human rights lawsuit filing. We explore these contextual factors in our cross-sectional analyses.

4.4 Cross-Sectional Analyses

4.4.1 Methodology

We conduct our analysis at the firm-litigation case level with *CAR* as the dependent variable, which is the cumulative abnormal returns for the days (0;2) following the filing of a lawsuit. To test Hypothesis 7, we include *ESG Score*, which we obtain from Refinitiv Datastream (previously Asset4) following Cheng et al. (2014) and S. Kim et al. (2021). We test Hypothesis 8 with the dummy variable *HR Policy*, which equals 1 if a company has a human rights policy in place in a given year and 0 otherwise (data obtained from Refinitiv).[11] We include further case- and firm-specific variables, which we briefly introduce here (see Table 4.7 in the online appendix for a detailed description) to rule out alternative explanations and to control for confounding effects.

The first case-specific variable, *Class Action Lawsuit*, is a dummy variable that equals 1 if the case against a company is a class-action lawsuit. Fauser and Utz (2021) argue that class action lawsuits are rare but extremely negative events for a company, which might attract higher levels of attention. Additionally, we include the two dummy variables *Lawsuit in OECD* and *Incident in OECD*, which equal 1 if the lawsuit or incident itself occurred in an OECD member country. We assume that lawsuits or incidents in OECD member countries are likely to attract more attention and are thus more likely to affect investors' perception of a firm. Furthermore, we include *ESG Controversies* to control

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[10]See, for example, the 2012 Annual Report of Harmony Gold (page 189): "At this stage and in the absence of a court decision on this matter, it is uncertain whether the company will incur any costs related to silicosis claims. Due to the limited information available on any claims and potential claims and the uncertainty of the outcome of these claims, no estimation can be made for the possible obligation."

[11]Refinitiv sets the *HR Policy* variable to 1 if a company has a policy for at least one of the following topics: freedom of association of its employees, child labor, forced labor, or respect for human rights in general. Additionally, Refinitiv sets the *HR Policy* variable to 1 if a company reports using human rights criteria in its process for supplier selection or monitoring.

for the number of ESG controversies a company faces. We add a binary variable *HR Conventions*, which is set to 1 if a firm claims to follow basic human rights conventions such as the UN's Universal Declaration of Human Rights.

Finally, we control for firm size with the logarithm of a firm's total assets *log(Total Assets)*. Following Cousins et al. (2020), we argue that firm size provides a proxy for the overall information environment, as large firms generally have more analysts and media outlets following them. We lose 43 observations for the cross-sectional analysis compared to the event study, due to missing data for the control variables. Equation 4.1 shows our main regression for the cross-sectional analysis. The subscripts i, t, and j indicate firm-, year-, and lawsuit-specific variables (i.e., a lawsuit can involve multiple firms).

$$\begin{aligned} \text{CAR}_{j,i,t} = {} & \alpha + \beta_1 \text{ESG Score}_{i,t-1} + \beta_2 \text{HR Policy}_{i,t-1} + \beta_3 \text{HR Conventions}_{i,t-1} \\ & + \beta_4 \text{log(Total Assets)}_{i,t-1} + \beta_5 \text{ESG Controversies}_{i,t-1} \\ & + \beta_6 \text{Class Action Lawsuit}_j + \beta_7 \text{Lawsuit in OECD}_j + \beta_8 \text{Incident in OECD}_j + \epsilon_{j,i,t} \end{aligned}$$
$$(4.1)$$

4.4.2 Results

We present univariate statistics in Table 4.2. Given a widespread distribution of *ESG Score* in our sample of firms with human rights litigation cases (*ESG Score*: P25: 53.92, P75: 82.57, Std. Dev.: 19.57), we observe that firms with both superior and inferior CSR performance are subject to human rights lawsuits. Consequently, human rights litigation cases as an empirical phenomenon likely do not only capture firms with worse CSR performance overall. Instead, the opposite seems to be true. When we compare the median ESG score of our sample (67.81) to the median ESG score for all firms in the Refinitiv universe (median ESG score of 34.51), we observe that our sample primarily consists of firms with a superior CSR performance. Then again, around 73% of our sample firms have a human rights policy in place before the human rights lawsuit occurs.

We present our cross-sectional multivariate results in Table 4.3. In column 1, we present our main results. Column 2 (3) also considers whether a firm had multiple human rights litigation cases (how many years a human rights policy has existed). Our dependent variable is *CAR*, which is the cumulative abnormal market return for the two trading days following (and including) the date of the human rights lawsuit (0;2). The coefficient for the variable *ESG Score* in column 1 is negative and statistically significant (p-value: .06), confirming Hypothesis 7. Consequently, firms with a high CSR performance suffer from a greater stock price decline than firms with a low CSR performance. With Hypothesis 8, we expect human rights policies to mitigate the negative reaction by investors. Indeed,

Table 4.2: This table reports the summary statistics of the variables deployed in the cross-sectional analysis.

	N	Median	Mean	Std. Dev.	P25	P75
CAR	119	-0.31	0.01	3.38	-1.28	0.82
ESG Score	119	67.81	65.69	19.57	53.92	82.57
HR Policy	119	1.00	0.73	0.45	0.00	1.00
HR Conventions	119	1.00	0.60	0.49	0.00	1.00
log(Total Assets)	119	18.23	17.94	1.85	17.00	19.05
ESG Controversies	119	66.67	57.39	39.88	11.11	100.00
Class Action Lawsuit	119	0.00	0.22	0.41	0.00	0.00
Lawsuit in OECD	119	1.00	0.76	0.43	1.00	1.00
Incident in OECD	119	0.00	0.31	0.46	0.00	1.00

Table 4.3: This table reports the results of an OLS estimation of equation 4.1. We lag all firm-specific independent variables by one year. We use robust standard errors clustered at the Refinitiv Business Classification industry level and report p-values next to each coefficient.

	(1)		(2)		(3)	
VARIABLES	CAR	p-value	CAR	p-value	CAR	p-value
ESG Score (H7)	**−0.0386**	**.06**	**−0.0311**	**.22**	**−0.0266**	**.04**
HR Policy (H8)	**1.5099**	**.02**	**1.4258**	**.04**	**1.8162**	**.05**
HR Conventions	0.2673	.70	0.2783	.72	0.4431	.65
log(Total Assets)	−0.1601	.23	−0.1548	.30	−0.1585	.17
ESG Controversies	−0.0152	.29	−0.0165	.29	−0.0153	.25
Class Action Lawsuit	0.1369	.84	0.1413	.83	0.2316	.75
Lawsuit in OECD	−0.1922	.73	−0.1415	.80	0.0364	.94
Incident in OECD	1.5675	.17	1.5749	.17	1.5992	.16
Multiple Cases			1.0990	.65		
ESG Score×Multiple Cases			−0.0187	.53		
Years HR Policy in existence					−0.1173	.39
Constant	YES		YES		YES	
Observations	119		119		119	
R-squared	.0893		.0919		.0998	

we find a positive coefficient for *HR Policy* (p-value: .02 in column 1), so firms with a human rights policy in place suffer from a less negative capital market reaction in the event of a human rights litigation case than firms without such a policy. In terms of economic significance, both *ESG Score* and *HR Policy* are meaningful and similar in their magnitude. A one standard deviation increase in *ESG Score* (having vs. not having an *HR Policy*) translates into a 22.49 percent decrease (43.02% increase) in CAR relative to

the standard deviation of CAR, which we consider to be an economically important effect size.[12]

Column 2 includes an interaction term between *ESG Score* and a binary variable indicating when companies are targeted in a second or subsequent lawsuit (*Multiple Cases*). Here, the coefficient for *ESG Score* and the interaction term *ESG Score×Multiple Cases* are statistically insignificant (p-values: .22 and .53). In contrast, the coefficient of *HR Policy* remains significant with a similar magnitude (p-value: .04). Hence, it appears that investors appreciate a human rights policy and attribute a lack of corporate mens rea no matter whether it is the first or a subsequent human rights litigation case. Lastly, in Column 3, we test whether it matters how long a company has a human rights policy in place (*Years HR Policy in existence*) as investors might assume mens rea if the policy has already been in place for longer. Here, the coefficient for *Years HR Policy in existence* is insignificant (p-value: .39). However, *HR Policy* remains positively significant (p-value: .05), again suggesting an unconditional beneficial effect of *HR Policy* on investors' reactions to human rights litigation cases.[13]

Taken together, our results underline the importance of human rights policies for strategic management when it comes to investors' reactions to human rights litigation cases. Our results suggest that policies explicitly targeting human rights can provide a buffer function, even in the case of multiple lawsuits against the same company. On the contrary, we fail to find evidence for an insurance-like effect of CSR in the case of human rights violations. Instead, a strong CSR performance amplifies the negative capital market reaction, suggesting that investors might be worried about other CSI-related litigation cases in other ESG areas.

4.4.3   Additional Analysis

We use the media attention of a lawsuit to analyze whether the previous results are driven by the filing of the case and not by other confounding variables. As argued by C. Liu et al. (2020), media attention provides a moderator on the lawsuit level that allows us to relate the filings to the subsequent market reaction. Additionally, Flammer (2013) notes that greater media attention might increase investor awareness. Extensive media coverage of CSI is also linked with increased financial risk for firms (Kölbel et al., 2017). To capture

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[12]For *ESG Score*, we obtain the effect size as follows: $\frac{\beta_{ESGScore}*SD_{ESGScore}}{SD_{CAR}}$, hence: $\frac{-0.0386*20.45}{3.51} = -22.49$ percent. As *HR Policy* is a binary variable, we calculate the effect size for both feasible values of the variable (i.e., 0 vs. 1).

[13]Across all columns, most of the control variables show relatively low levels of statistical significance. We attribute this to the use of the three-factor model by Fama and French (1993) in the calculation of the CARs, which already controls for important firm characteristics such as firm size.

the media attention on a lawsuit, we collect news data from Factiva for each human rights litigation case in our sample (see section 4.A of the online appendix for more details). We create an interaction term using a binary variable *Media Attention* that equals 1 if the lawsuit creates more than the median number of articles across our sample, and 0 otherwise.[14] Following Flammer (2013) and Kölbel et al. (2017), we repeat our Factiva search on three widely read financial newspapers and magazines, namely the *Financial Times*, the *Wall Street Journal*, and *The Economist*. We again create a binary variable *Media Attention*. Table 4.4 displays the results.[15] Columns 1 and 2 present the coefficients using media coverage from all outlets. The coefficients of the two interaction terms *HR Policy×Media Attention* and *ESG Score×Media Attention* are statistically insignificant (p-values: .81 and .30 respectively). These results imply that media attention, in general, does not alter the overall effect of CSR or the existence of a human rights policy on abnormal returns.

Contrary to the first columns, the analysis using media attention from the financial press (Columns 3 and 4) yields statistically negative coefficients for both interaction terms. The coefficient of the interaction term *HR Policy×Media Attention* variable is negative (p-value: .02) and has almost the same magnitude as the *HR Policy* variable. Consequently, the buffer provided by human rights policies seems to diminish if a case receives intense media attention from the financial press, which likely provides a more in-depth analysis than other news outlets without explicit financial expertise. We argue this might be due to critical media reports about the case, where investors are more likely to blame the company for the incident (i.e., assuming corporate mens rea). Similarly, the interaction term *ESG Score×Media Attention* is negative (p-value: $< .001$), implying that the negative effect of high CSR activities in the case of human rights lawsuits is even more pronounced if a lawsuit receives more attention from the financial press. Again, we argue that greater coverage by the financial press amplifies the focus on the firm, with investors likely to blame management more for the incident.

4.5 Discussion and Concluding Remarks

Our results provide insights into the consequences that companies face in the case of corporate misconduct. We extend Godfrey (2005) and the literature on corporate mens rea by analyzing human rights litigation lawsuits and how they relate to CSR activities

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[14]Our results remain unchanged if we replace the binary variable with a continuous variable.

[15]Our results in Table 4.3 remain unchanged if we include *Media Attention* as an additional control variable.

Table 4.4: This table reports the results for each human rights litigation case's publicity. We lag all firm-specific independent variables by one year. Columns 1 and 2 below "All Articles" include news published in English media outlets. In contrast, columns 3 and 4 below "Financial Press" only include news published in the *Financial Times*, the *Wall Street Journal*, and *The Economist*. We cluster robust standard errors at the Refinitiv Business Classification industry level and report p-values next to each coefficient.

| | (1) | | (2) | | (3) | | (4) | |
| | All Articles | | | | Financial Press | | | |
VARIABLES	CAR	p-value	CAR	p-value	CAR	p-value	CAR	p-value
ESG Score (H7)	**−0.0383**	**.07**	**−0.0276**	**.35**	**−0.0323**	**.08**	**−0.0079**	**.69**
HR Policy (H8)	**1.4436**	**.00**	**1.6548**	**.02**	**2.3130**	**.00**	**1.5372**	**.02**
HR Conventions	0.0685	.92	0.0410	.95	0.4000	.64	0.3238	.67
log(Total Assets)	−0.2244	.16	−0.2329	.11	−0.0795	.19	−0.1526	.00
ESG Controversies	−0.0141	.31	−0.0147	.30	−0.0166	.23	−0.0178	.23
Class Action Lawsuit	0.2144	.76	0.2473	.71	0.1358	.83	0.0932	.88
Lawsuit in OECD	0.1489	.73	0.0896	.85	−0.5986	.42	−0.4767	.52
Incident in OECD	1.2145	.22	1.2111	.22	1.8450	.15	1.8054	.15
Media Attention	0.6933	.50	2.4870	.17	0.8882	.25	3.4190	.00
HR Policy×Media Attention	0.3364	.81			−2.2840	.02		
ESG Score×Media Attention			−0.0232	.30			−0.0609	.00
Constant	YES		YES		YES		YES	
Observations	119		119		119		119	
R-squared	.1030		.1067		.1169		.1225	

and public attention. Contrary to Christensen (2016), who shows that CSR reporting in general buffers the reaction following adverse events in general, we disaggregate CSR into two specific elements: a firm's general/overall CSR performance, and human rights policies as a specific CSR measure. We find different results for these two elements. Companies with better CSR performance see a more significant decline in their share price. This supports the expectancy violation theory (Nardella et al., 2020) and aligns with the view that investors require specific precautionary measures to assume a lack of corporate mens rea.

Conversely, we show that a human rights policy mitigates the negative capital market reaction around a human rights litigation case. We argue that a human rights policy provides this buffer because shareholders look for signs of corporate mens rea when evaluating their reaction to an adverse event (Godfrey, 2005; Godfrey et al., 2009). Investors perceive a human rights policy as indicating that the occurrence of the event was not due to corporate negligence or recklessness. Firms incorporating sustainability as an essential factor in their operations should pay attention to human rights to avoid a negative backlash in the case of a human rights litigation case. As firms with better CSR performance face a more significant decline in their share price following a filing, investors seem to react quickly when they see a gap between perceived sustainability compared to a company's actions. Lastly, our results extend studies on the insurance-like property of CSR, such as Shiu and Yang (2017), by pointing out that pursuing overall CSR is not sufficient in the case of CSI. Rather, sub-aspects of CSR require actions in these particular sub-areas.

We show that human rights policies create a buffer when there is human rights litigation. Future studies might provide a more detailed analysis, as we do not differentiate policies by quality or state of implementation within a company.

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Appendix 4.A

Event Study Methodology

This section provides a more detailed summary of our event study methodology and the human rights lawsuits in our sample (i.e., events). Specifically, we provide:

- distribution of human rights-related lawsuits over time and across industries,

- estimation approach for cumulative abnormal returns,

- sample selection procedure,

- some further univariate statistics (e.g., average abnormal returns around different event dates and requested compensation amounts per lawsuit), and

- detailed description of all variables used in our main models.

Distribution of Human Rights-Related Lawsuits Over Time and Across Industries

Panel A of Figure 4.1 shows that the occurrence of human rights-related lawsuits is relatively constant across time. Panel B of Figure 4.1 shows that companies within specific industries — especially basic minerals, i.e., mining, and energy — are prone to human rights-related lawsuits.

Estimation Approach for Cumulative Abnormal Returns

Our event period spans three days around the filing of a lawsuit, with the filing date being the focal day. Additionally, we analyze the incident date, where available, as some corporate human rights violations might have had financial consequences immediately after the human rights violation occurred. Finally, we analyze the stock price reaction when a case is closed, either by settlement or judgment. The closing day is another opportunity for investors to (potentially better) assess the impact of the lawsuit on the affected company.

Following Campbell et al. (2010), our estimation period spans 250 trading days and ends 21 days before each event date. We use the three-factor model by Fama and French (1993), displayed in the following equation, to calculate expected returns.

$$R_{i,t} = \alpha_i + \beta_i R_{i,t}^M + s_i SMB_{i,t} + h_i HML_{i,t} + \epsilon_{i,t}, \tag{4.2}$$
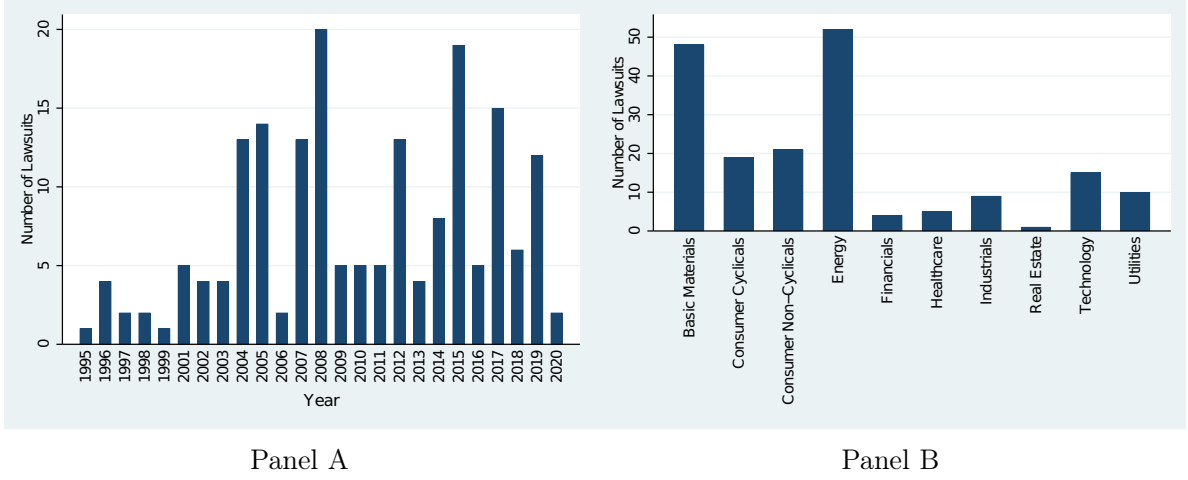
Panel A   Panel B

Figure 4.1: This figure provides details of our sample. Panel A provides an overview of the distribution of the lawsuits across time, while Panel B provides an overview of the lawsuits across industries.

where $R_{i,t}$ is the observed return for firm i on day t. We calculate a country-specific market return $R_{i,t}^M$ using data from all companies listed in the total market indices by Thomson Reuters Datastream. Additionally, we use data from Thomson Reuters Datastream to calculate the other two factors of the Fama-French three-factor model SMB and HML. The abnormal return $AR_{i,t}$ is then defined as the difference between the observed return and its predicted value:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{i,t}^M + \hat{s}_i SMB_{i,t} + \hat{h}_i HML_{i,t}) \tag{4.3}$$

To aggregate the company-specific abnormal returns $AR_{i,t}$ and calculate average abnormal returns (AAR) for all days of our event periods, we use the following equation:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{i,t} \tag{4.4}$$

Additionally, we calculate the cumulative average abnormal return (CAR) defined in equation 4.5.

$$CAR[\tau_1, \tau_2] = \sum_{t=\tau_1}^{\tau_2} AAR_t \tag{4.5}$$

Campbell et al. (2010) underline the importance of using the correct test statistics when conducting multi-country event studies. Using a simulation study, the rank test (Corrado, 1989) and the generalized sign test (Cowan, 1992) provide the most powerful

results. Hence, we use the rank test outlined in Corrado and Zivney (1992) and the generalized rank test proposed by Kolari and Pynnonen (2011) to address the econometric problems arising from event date clustering.

Sample Selection Procedure

We start with 315 observations belonging to 204 lawsuits. After excluding private firms and firms for which no stock prices were available on Refinitiv Datastream our event study sample includes 162 observations from 112 lawsuits. For the cross-sectional analysis, we require ESG as well as human rights data, again from Refinitiv Datastream. Due to data availability, we lose 43 observations. Our final sample consists of 77 lawsuits (119 observations). Table 4.5 gives an overview of our sample selection procedure.

Table 4.5: This table reports the sample selection procedure.

		Number of	
		lawsuits	observations
	BHRRC data	204	315
-	thereof private firms	69	116
-	no stock prices available	23	37
=	Event Study sample	112	162
-	missing ESG data	33	41
-	missing Human Rights data	2	2
=	Final sample	77	119

Average Abnormal Returns Around Different Event Dates

Table 4.6 shows the AARs of companies subject to a human rights litigation case. As not all litigations included in the BHRRC database state an incident date and some cases were still open or do not allow filing a motion to dismiss, the number of observations in each column varies. Column 1 analyzes capital market reactions before and after filing a lawsuit. While the table shows a somewhat negative return on the day of the filing, the coefficient is not statistically significant for common confidence levels. We find similar results for the other event dates. Only the negative average abnormal return on the day a lawsuit is closed indicates an abnormal return different from zero (p-value: .08). However, our sample only includes 65 observations where a judgment date was available, so we would like to stress this as a caveat.

Table 4.6: This table reports the results of average abnormal returns for different sub-samples. The columns Kolari and Corrado, respectively, indicate the p-values according to the test proposed by Kolari and Pynnönen (2010) and the Corrado and Zivney (1992) rank test. CAR values in percent.

t	Date of Filing			Date of Incident			Date of Judgement		
	AAR	Kolari	Corrado	AAR	Kolari	Corrado	AAR	Kolari	Corrado
–3	0.14	.41	.33	–0.02	.86	.98	0.14	.84	.82
–2	0.09	.79	.83	0.87	.12	.29	–0.04	.57	.66
–1	–0.05	.97	.89	0.74	.16	.19	–0.15	.71	.78
0	–0.14	.57	.40	–2.86	.11	.31	–0.45	.11	.08
1	0.03	.38	.15	–0.58	.51	.93	0.41	.21	.25
2	0.09	.78	.85	–0.00	.65	.45	–0.50	.08	.09
3	–0.22	.72	.50	–0.00	.90	.43	–0.14	.75	.89

Variable Definitions

This table presents variable definitions for the variables we use in our cross-sectional analysis. Where available, we state the Refinitiv Datastream code in brackets.

Human Rights Lawsuits in Our Sample With the Highest Amount Requested As Compensation

Table 4.8 displays the lawsuits included in our sample with the highest amount requested for compensation at the beginning of the trial. The table shows that some firms were repeatedly sued and that the amount requested varies greatly by case. As data on the amount requested was only available for a small subset (N=28) of all lawsuits in our sample, we did not consider the variable in our statistical analyses.

Table 4.7: This table reports descriptions of the variables used in our analysis. The subscripts i, t, and j indicate firm-, year-, and lawsuit-specific variables.

VARIABLES	Definition
ESG Score$_{i,t}$	The total ESG score for firm i in year t
HR Policy$_{i,t}$	Dummy variable, equal to 1 if firm i has a human rights policy in year t, 0 otherwise (Item: SOHRD01V)
HR Convention$_{i,t}$	Dummy variable, equal to 1 if firm i claims to comply with the fundamental human rights convention of the ILO or support the UN declaration of human rights in year t, 0 otherwise (Item: SOHRDP012)
log(Total Assets)$_{i,t}$	Natural logarithm of the total assets for firm i in year t (Item: WC02999)
ESG Controversies$_{i,t}$	ESG controversies category score measures a company's exposure to environmental, social, and governance controversies and negative events reflected in global media. (Item: TRESGCCS)
Class Action Lawsuit$_j$	Dummy variable, equal to 1 if lawsuit j is filed as a class action lawsuit, 0 otherwise
Lawsuit in OECD$_j$	Dummy variable, equal to 1 if lawsuit j is filed in an OECD country, 0 otherwise
Incident in OECD$_j$	Dummy variable, equal to 1 if the incident of lawsuit j happened in an OECD country, 0 otherwise
Multiple Cases$_{i,t}$	Dummy variable, equal to 1 if the company i was already subject to a previous lawsuit in year t, 0 otherwise
Years HR Policy in existence$_{i,t}$	Variable indicating how long (in years) a human rights policy has been in place for firm i in year t
Media Attention$_j$	Dummy variable, equal to 1 if lawsuit j receives more than the median number of articles across the lawsuit period, 0 otherwise

Table 4.8: This table reports the human rights lawsuits in our sample with the highest amount requested as compensation.

Title	Company Name	Filing Date	Value (in USD)
BHP & Vale lawsuit (re dam collapse in Brazil filed in Brazil)	BHP / Vale	November 17th, 2015	5,299,999,744
Gold miner silicosis litigation (re So. Africa)	Multiple Defendants[16]	December 21st, 2012	353,000,000
Shell/BASF lawsuit (re Brazil)	Royal Dutch Shell / BASF	March 9th, 2007	316,000,000
Shell lawsuit (re oil spills & Bodo community in Nigeria)	Royal Dutch Shell	March 23rd, 2012	82,901,504
Pfizer lawsuit (re administration of experimental drug in Nigeria filed in Nigeria)	Pfizer	May 30th, 2007	75,000,000
BHP & Vale lawsuit (re dam collapse in Brazil filed in the USA)	BHP	August 9th, 2018	50,000,000
Mitsubishi lawsuit (re sexual harassment in the USA)	Mitsubishi Group	April 9th, 1996	34,000,000
Shell lawsuit (re executions in Nigeria Wiwa v Shell filed in the USA)	Royal Dutch Shell	December 1st, 1996	15,500,000
Volkswagen (re military dictatorship Brazil)	Volkswagen	September 1st, 2015	6,469,700
Nishimatsu lawsuit (re World War II forced labor)	Nishimatsu Construction	January 1st, 1998	2,740,000

[16] AngloGold Ashanti / Gold Fields / African Rainbow Minerals / Anglo American South Africa / Harmony Gold

Media Attention

We collect information on the press coverage a lawsuit receives as it provides a case-specific moderator to the market reaction following a lawsuit filing. We search the Factiva database using a standardized search string. We require the article to include the defendant's company name and at least one of the following keywords: "lawsuit", "litigation", "litigate", "sue", "sued", "court". We require the article to include the country of the incident to avoid false positives. We only consider articles written in English and published within the lawsuit period, which we define as starting 15 days prior to the filing and lasting until 15 days after the termination of the lawsuit. If neither settlement nor termination date is available, or if the case status is open according to the BHRRC database, we include all articles published until June 30th, 2021. We use the number of articles returned by each search query to proxy the media attention a lawsuit receives.

Examples of Human Rights Policies

BHP Group Limited & Plc (2019)

BHP

Human Rights
Policy Statement

Our Commitment

Human rights are the basic political, civil, economic, labour, social and cultural rights and freedoms to which all people are entitled, without discrimination[1]. It is expected that businesses respect human rights throughout the value chain.

We believe that respecting human rights and contributing to the realisation of rights is not only critical to the sustainable operation of our business, it is the right thing to do. We see human rights as critical to our ability to contribute meaningful and ongoing social value to our stakeholders. Simply put, our success depends upon how well we respect the rights of individuals and groups who interact with and are impacted by our business operations and relationships.

We demonstrate our commitment to respecting human rights by:

- Respecting internationally recognised human rights as set out in the Universal Declaration on Human Rights.

- Complying with applicable laws and regulations of the countries in which we operate, and where differences exist between *Our Code of Conduct (Our Code)* and local customs, norms, rules or regulations, we apply the higher standard.

- Operating in a manner consistent with the United Nations (UN) Guiding Principles on Business and Human Rights, the 10 UN Global Compact Principles, the Voluntary Principles on Security and Human Rights and the International Council on Mining and Metals (ICMM) Indigenous Peoples Position Statement.

- Operating in a manner consistent with the terms of the ILO Declaration on Fundamental Principles and Rights at Work, including the four Core Labour Standards the subject of the ILO Conventions upon which the Declaration is based, concerning:
  - freedom of association and the effective recognition of the right to collective bargaining;
  - the elimination of all forms of forced or compulsory labour[2];
  - the effective abolition of child labour; and
  - the elimination of discrimination in respect of employment and occupation.

We are committed to respecting and contributing to the realisation of all human rights, prioritising those based on risk to the people, including vulnerable or marginalised groups, potentially impacted by our operations and business relationships and the related risk to BHP. These include rights related to:

- workplace health, safety and labour conditions;

- freedom from discrimination based on personal attributes unrelated to job performance, such as race, ethnicity, gender identity, sexual orientation, intersex status, physical or mental disability, mental illness, relationship status, religion, political opinion, pregnancy, breastfeeding or family responsibilities;

- the activities of security providers;

- land access and use;

- water and sanitation;

- Indigenous peoples' culture, identity, traditions and customs; and

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[1] As defined by the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights.

[2] Forced or compulsory labour includes slavery or slave-like practices, various forms of debt bondage, and human trafficking

- communities / project affected stakeholders near our operations including our tailings storage facilities[3] – including resettlement and consultation and consent processes.

We recognise we must continually assess the human rights context of our activities, including impacts that we may cause and those to which we may contribute or be directly linked. This determines the prevention, mitigation and remedy measures required, including using leverage in our business relationships.

Our Approach

We respect human rights by embedding relevant international standards and frameworks in our systems and processes.

Governance and Due Diligence

Our Code sets our human rights commitments and the standards of behaviour for our people, as well as our expectations for all third parties we deal with, including our suppliers, contractors and customers, community partners and governments. The human rights commitments in *Our Code* are implemented through mandatory minimum performance requirements in *Our Requirements* standards and through our Policy Statements. We recognise that human rights may be impacted by many different business activities, therefore *Our Requirements* standards require we take a risk-based approach that considers human rights, social and community, environmental, direct, indirect and cumulative impacts in a range of circumstances, including:

- For our operations, we set the standard and provide guidance for regular completion of human rights due diligence and human rights impact assessments; planning, documenting and responding to stakeholder engagement including complaints and grievance management; respecting Indigenous peoples' rights and meeting our commitment to the ICMM Indigenous Peoples Position Statement; and considering community resettlements.

- For decisions around acquisitions and divestments, new activities in high-risk countries and major projects, human rights, social and community impact issues must be considered and a human rights impact assessment performed for the key phases of our major projects.

- For the closure of our sites, we require a risk assessment that includes risks associated with social, environmental, direct, indirect and cumulative impacts and an external stakeholder engagement plan, including community, for the site lifecycle.

- We require the assessment and management of tailings storage facilities in a manner that respects human rights and is aligned to the Global Industry Standard on Tailings Management.

- *Our Requirements for Security, Crisis and Emergency Management and Business Continuity Plans* standard sets out how we must comply with the Voluntary Principles on Security and Human Rights.

- *Our Requirements for Supply* standard maintains supplier prequalification, contracting and ongoing monitoring requirements to manage supplier risks, including in relation to human rights, and applies globally defined *Minimum supplier requirements* for suppliers and contractors.

- Our *Indigenous Peoples Policy Statement* and Strategy is aligned to the ICMM Indigenous Peoples Position Statement and drives our approach to engaging and supporting Indigenous peoples and addressing the principle of free, prior and informed consent.

- We acknowledge the connection between environmental sustainability and human rights and, through *Our Requirements for Environment and Climate Change* standard, set standards and governance and risk management processes to sustainably manage air, land, biodiversity and water resources.

- Our Position Statements on *Climate Change* and *Water Stewardship* recognise the shared challenge of addressing these global issues and set our commitments and approaches to playing our part.

Human rights are also integrated into BHP's risk management system through these standards. Our Board Sustainability Committee assists with governance and monitoring of our approach, overseeing health, safety, environment, community (HSEC) and other human rights matters, including the adequacy of the systems in place to identify and manage HSEC-related risks, legal and regulatory compliance and overall performance.

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[3] Aligned with the Global Industry Standard on Tailings Management

Stakeholder engagement

Meaningful stakeholder engagement is essential to our efforts to meet the responsibility to respect human rights. We engage with and respond to civil society, communities and investors on issues related to our business and strive for transparency in our interactions.

We undertake regular engagement with our stakeholders to listen, understand, prevent and mitigate the adverse impacts of our activities on human rights from new country entry to closure. We recognise the significance of two-way dialogue in highlighting concerns and perspectives and human rights are a core element of our approach to social value assessments and planning.

Our Forum on Corporate Responsibility provides access to independent civil society leaders in various sustainability fields who help us engage with our stakeholders, develop our standards and gain insight into current and emerging issues. This group meets regularly with BHP's CEO and other senior leaders and also engages with our Board.

Relationships

We seek opportunities to work with our employees, contractors and suppliers to develop and participate in knowledge-sharing and training, increasing our shared understanding of human rights and improving our collective performance. We seek to use our leverage, wherever possible, to encourage our non-operated joint ventures and minority interests to adopt similar practices and standards, aligned to international human rights best practice.

We recognise the potential for human rights risks in all jurisdictions and are committed to building an ongoing dialogue with stakeholders, including industry associations, civil society, governments and regulators to improve our understanding of these risks and promote respect through engagement, collaboration and public policy.

Remediation and Reporting

BHP's *Speaking up with confidence* guidance note, embedded in *Our Code*, explains how to protect people who speak up. It applies to everyone. We encourage our employees, everyone who works with us, and all those affected by our business globally to promptly raise a concern about anything that they reasonably believe may be illegal, improper or involve misconduct. This includes a concern about a safety or environmental issue, a financial matter (including tax affairs), a breach of *Our Charter* values or *Our Code*, including a human rights violation, or a concern about retaliation for speaking up.

A confidential, 24-hour, multilingual business conduct hotline (EthicsPoint) and local-level, complaints and grievance mechanisms are required to be in place and we acknowledge, investigate as appropriate and document all concerns raised through these mechanisms. Where concerns are investigated and substantiated, we take appropriate remedial actions, advise the reporter (where possible) and document the outcomes. We will provide, or cooperate in providing, appropriate remediation where we have caused or contributed to adverse human rights impacts. We report annually on EthicsPoint cases and complaints and grievances.

BHP is committed to respecting the role of human rights defenders and we acknowledge the risks they face in upholding civic freedoms and their significant voice in understanding and addressing human rights challenges in the areas in which we operate. Under *Our Code*, BHP does not allow any form of punishment, discipline or retaliatory action to be taken against anyone for speaking up, or cooperating with an investigation.

We have systemic processes to audit adherence to BHP's mandatory minimum human rights performance requirements across our operated activities, and develop improvement plans where necessary. We report annually on our human rights performance, including key elements of our commitments to international standards, through our Sustainability Report and applicable Modern Slavery reporting laws.

This Policy Statement will be reviewed annually.

Vale S.A. (2019)

Human Rights Policy

DCA 090/2019	Rev.: 02-26/11/2019	Nº: POL-0005-G	PUBLIC

Objective: To establish guidelines and general principles so that Vale´s actions are carried out with the respect for Human Rights in the development of its activities, partnerships and in its production chain, in all the regions where it is present and in the entire lifecycle of its enterprises.

Application:

This Policy applies to Vale and its wholly-owned (100%) subsidiaries and shall be followed by its direct and indirect subsidiaries, in Brazil and in other countries, always respecting the instruments of incorporation and applicable law. Its adoption is encouraged in other entities in which Vale is a shareholder, in Brazil and in other countries.

All Employees, Administrators, and Members of the Fiscal Council of Vale and its subsidiaries must know and adhere to the rules set forth in this Policy and are responsible for disseminating and practicing the guidelines contained herein.

All Customers and Suppliers, including other Partners, of Vale and its subsidiaries must know and observe this Policy to guide their conduct and to avoid conflicts and violations.

The guidelines set forth in this Policy shall apply globally, even if the respective local laws have more lenient rules and therefore allow or tolerate conduct different from the ones set forth herein. In cases of conflict between this Policy and local law, the most protective rule should apply.

References:

- POL-0001-G – Code of Ethical Conduct
- POL-0009-G – Risk Management Policy
- POL-0016-G – Anti-Corruption Policy
- POL-0019-G – Sustainability Policy
- POL-0025-G – Sanctions and Compliance Policy
- POL-0024-G – Socioenvironmental Investments Policy

Definitions:

- **Administrators:** any member of Vale's Board of Directors, Advisory Committees, and Executive Board or its subsidiaries, or occupy another statutory or similar position, in accordance with applicable laws in the jurisdictions in which Vale or its subsidiaries operate.
- **Customers:** Any customer, including its intermediaries, of Vale's or its subsidiaries' products or services.
- **Employees:** any employee, direct or contracted, temporary or not, intern and/or trainee of Vale or its subsidiaries.
- **Suppliers:** any supplier of goods and/or services of Vale or its subsidiaries.
- **Partners:** any entities (associations, institutions, organizations, etc.) with which Vale or its subsidiaries enter into any type of commercial, technical, social, institutional partnership, among others, that do not constitute a Customer or Supplier.

General Principle:

Respect, raise awareness, and promote human rights, prevent potential adverse impacts and potential human rights violations, and when necessary, mitigate and remedy them, in Vale's activities and throughout its supply chain, through engagement with stakeholders and in accordance with the following international principles and standards:

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Política de Direitos Humanos

	POL-0005-G	Rev.: 02-26/11/2019	DCA 090/2019	PÚBLICO

- Universal Declaration of Human Rights;
- United Nations International Covenant on Economic, Social and Cultural Rights;
- United Nations International Covenant on Civil and Political Rights;
- International Labour Organization (ILO) Declaration on Fundamental Principles and Rights at Work;
- United Nations Declaration on the Rights of Indigenous Peoples;
- United Nations Global Compact;
- United Nations Guiding Principles on Business and Human Rights;
- Voluntary Principles on Security and Human Rights (VPSHR);
- International Council on Mining and Metals (ICMM);
- Organization for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises;
- Sustainable Development Goals (SDGs) guidelines, goals, and indicators;
- International Finance Corporation (IFC) Performance Standards.

Action and management guidelines for respect, awareness, promotion and remediation of Human Rights:

Vale's human rights activities and management are anchored in the United Nations Guiding Principles on Business and Human Rights:

- Policy Commitment:
  In addition to this Human Rights Policy and other company regulations, Vale has a Human Rights Guide and specific documents that help address relevant human rights issues in the extractive sector. The company makes the Guide and supporting documents available to all employees through dissemination processes and on-site and online training.

- Due Diligence:
  Vale implements its human rights due diligence process following the steps below:
  − Assess potential human rights risks and impacts of its activities by identifying, designing and implementing detection, preventive and mitigation controls;
  − Integrate the results of the above-mentioned assessment into company processes, including review of standards, procedures, budget, among others;
  − Monitor controls to analyze their effectiveness in Vale activities and in relation to its suppliers and its supply chain;
  − Report the company's human rights risk and impact management performance.

- Remediation:
  Vale undertakes, when necessary, measures to remediate any adverse human rights impacts it has caused or contributed to and collaborates with other relevant human rights initiatives in the territories where it operates. It does this directly and/or through partners, seeking to involve relevant stakeholders in the design and implementation of remediation actions and is committed to the non-repetition principle.

- Establishment of Grievance Mechanisms:
  Vale seeks to establish legitimate, accessible, and equitable channels for capturing all types of manifestations, including demands, claims, and complaints. In the case of complaints, the company has a specific complaint channel, through the Ombudsman, and ensures the option of anonymity. Vale also provides community relations professionals whose objective is to strengthen dialogue and engagement. Vale's grievance mechanisms do not prevent access to other judicial or extra judicial mechanisms. Vale considers its grievance mechanisms to be fundamental tools for the prevention and remediation of potential human rights impacts and violations.

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Stakeholders:

Vale´s ability to influence the respect for human rights in its value chain varies depending on the level of interaction with its stakeholders. With those who the company has a direct contract with, it is possible to implement preventive measures and respect for human rights. With others, Vale seeks to establish actions to raise awareness and promote human rights. Vale encourages its customers, suppliers, and partners to act in the same way with all their stakeholders.

Based on the guidelines set forth in this Policy, Vale interacts with its stakeholders through the following actions:

Employees:

- to provide structured, transparent, and effective selective processes, valuing local hiring.
- to provide decent working conditions.
- to promote educational actions that enable the professional and personal growth of employees.
- to maintain a safe and healthy work environment.
- to respect and value diversity, promote inclusion, and not tolerate discrimination or harassment of any nature, including moral or sexual, in accordance with applicable local laws.
- to respect and practice the freedom of association and collective bargaining in all areas, in accordance with applicable local laws.
- to provide training to help promote the respect of human rights to ensure that all employees are aware of and enforce its principles, as employees are both the subject and strategic agent of human rights.

Vale prohibits the use of child labour and any kind of employment practice that may be interpreted as equivalent to forced or modern slavery labour in its activities and by its suppliers and expects its customers and partners to act the same.

Security teams (direct employees and contractors):
Vale is a signatory and applies the Voluntary Principles on Security and Human Rights (VPSHR) in its activities. It includes potential human rights violation risks in its risk assessment of security requirements. The Company's management approach considers the following aspects:

- to select employees and strictly monitor them, considering previous experience, technical capacity, and emotional stability.
- to regularly train security professionals to carry out their activities in line with human rights principles and the proportional and progressive use of force.
- to seek peaceful solutions that ensure the physical integrity of people, as well as the preservation of assets, information, and the maintenance of the production process.
- to work in accordance with the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials.
- to abide by the United Nations Code of Conduct on law enforcement by officials.
- to treat vulnerable people and groups with special care, especially when involving women and children.

Vale is committed to collaborating with public safety providers and communicating its policy to demonstrate its commitment to respecting the human rights of its administrators and employees and all members of the communities in which it operates. The company rejects the abuse of power and inhumane treatment and acts to ensure and foster non-discrimination and respect for citizens' privacy.

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Clients, Suppliers, and Partners:
- to establish relationships with entities that share the same principles and values as Vale and are aligned with this Human Rights Policy, the Sustainability Policy, the Code of Ethical Conduct, and the Supplier's Code of Ethics and Conduct.
- to promote respect for human rights in its value chain, including the adoption of contractual clauses and the requirement for supporting documentation of legal compliance.
- to notify the customer, supplier, and/or partner in the event of breach of human rights, duly substantiated, to take corrective action, as well as perform the appropriate contractual arrangements.
- to provide training to help promote the respect of human rights.
- to encourage suppliers to ensure the selection of business partners that operate within labor, environmental, and ethical standards consistent with the Supplier´s Code of Ethics and Conduct provisions.

Vale requires, through contractual clauses, that its suppliers prohibit the use of child labor and any type of employment practice that may be interpreted as equivalent to forced or modern slavery.

Local Communities:
- to know and respect the communities and territories where Vale operates or intends to operate.
- to prioritize and establish an ongoing process of engagement with communities in the areas of influence of its enterprises, ensuring management of potential human rights risks and impacts.
- to involve communities in the process of assessing potential human rights risks and impacts, as well as in defining prevention, mitigation and, when needed, remediation measures.
- to respect the right to information and participation and the right to freedom of peaceful assembly, expression, and manifestation of the communities.
- to recognize the importance of communities' right to access to land and other natural resources.
- to respect the right of communities to water availability, quality and accessibility, and contribute to maintaining and improving the quality of life and sustainable local development of communities.
- to adopt educational initiatives to promote the respect for human rights.

Vale promotes human rights awareness actions, with special attention to the eradication of forced, modern slavery, and child labor and the promotion of the rights of children and adolescents, with specific efforts to combat the sexual exploitation of minors in the vicinity of its operations in all phases of the life cycle. In addition, Vale expects its suppliers and partners to also respect these rights and to act the same way.

Indigenous Peoples and Traditional Communities:
- to promote respect for the rights, cultures, customs, heritage, and livelihoods of indigenous peoples and traditional communities.
- to recognize the right of access to land and water, as well as the immaterial value that these natural resources represent for indigenous peoples.
- to promote consultation and free, prior and informed consultation and consent and assessments of potential human rights risks and impacts.
- to contribute to the promotion of the ethnodevelopment of these peoples and communities.

Vale is committed to the International Council on Mining and Metals (ICMM) Positioning on Indigenous Peoples and Mining, complies with specific applicable laws, follows the principles of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the Convention number 169 of the International Labor Organization (ILO), and expects its clients, suppliers, and partners to respect the same rights.

Política de Direitos Humanos | VALE

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Human Rights Defenders:
- to respect the freedom of expression and demonstration of all persons, provided that they occur in a peaceful manner and do not impact the human rights of any person and current local laws.
- to use as a reference in the process of assessing potential human rights risks and impacts the United Nations Declaration on the Right and Responsibility of Individuals, Groups or Organs of Society to Promote and Protect Universally Recognized Human Rights and Fundamental Freedoms (Resolution 53 / 144), which deals with the work of human rights defenders.
- to seek engagement with human rights defenders to address common challenges, through regular and proactive dialogue.

Vale does not tolerate or contribute to threats, intimidation, and attacks against human rights defenders and provides grievance mechanisms for registering and handling potential adverse impacts from its activities. Vale also expects its customers, suppliers, and partners to respect the rights of human rights defenders and to act the same way.

Government and Society:
- to observe the laws and regulations of the locations where the company operates.
- to cooperate with the authorities to respect and promote human rights.

Vale cooperates with the investigation of potential impacts and violations of Human Rights in its activities and throughout its production chain.

Relevant Issues in the Mining Sector:
- to support recognized initiatives that seek to mitigate the potential negative social, economic, and environmental impacts related to mining activities, including artisanal and small-scale mining; health and safety; diversity and gender and involuntary resettlement;
- If the involuntary resettlement process is unavoidable as a result of its activities, the company works in accordance with International Finance Corporation (IFC) Performance Standard No. 5 to minimize potential impacts on affected communities;
- In the case of legal small-scale and/or legal artisanal mining in areas within or adjacent to its operations, the company seeks to contribute to the dissemination of good environmental, health and safety practices, child and adolescent rights, and working conditions.

General Provisions:
- This policy is based on Institutional Commitments and International Reference Standards related to human rights issues, listed in Annex 1.
- Any violations of this Policy are considered violations of the Company's Code of Ethical Conduct and are subject to the penalties provided for therein.
- This Policy shall be reviewed periodically, at least once (1) every three (3) years or on demand and submitted for approval by the Board of Directors.

Política de Direitos Humanos

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VALE

Annex 01 - International Commitments and References

Institutional Commitments:

- *International Council on Mining and Metals (ICMM)*
- *Voluntary Principles on Security and Human Rights (VPSHR)*
- *Women's Empowerment Principles, United Nations (UN Women) guidelines*

International Reference Standards:

- *Universal Declaration of Human Rights*
- *International Covenant on Civil and Political Rights*
- *International Covenant on Economic, Social and Cultural Rights*
- *United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)*
- *United Nations Guiding Principles on Business and Human Rights*
- *International Finance Corporation (IFC) Performance Standards*
- *Global Reporting Initiative (GRI)*
- *ISO 26000 - Social Responsibility*
- *OHSAS 1800, 2007 - Occupational Safety and Health Management System*
- *SA 8000, 2008 - Social Responsibility.*
- *Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises*
- *United Nations Global Compact*
- *United Nations Basic Principles on the Use of Force and Firearms by Law Enforcement Officials*
- *United Nations Code of Conduct on Law Enforcement by Officials*
- *Eight Fundamental Conventions of the International Labor Organization (ILO) and two other relevant ones (169 and 176)*
  - *Convention No. 29 on Forced or Compulsory Labor, 1930*
  - *Convention No. 87 on Freedom of Association and Protection of the Right to Organize, 1948*
  - *Convention No. 98 on the Right to Organize and Collective Bargaining, 1949*
  - *Convention No. 100 on Equal Remuneration, 1951*
  - *Convention No. 105 on the Abolition of Forced Labor, 1957*
  - *Convention No. 111 on Discrimination (Employment and Occupation), 1958*
  - *Convention No. 138 on Minimum Age, 1973*
  - *Convention No. 169 on Indigenous and Tribal Peoples,1989*
  - *Convention No. 176 on Mine Safety and Health, 1995*
  - *Convention No. 182 on Worst Forms of Child Labor, 1999*
  - *Voluntary guidelines for responsible governance of land, fisheries and forest land regimes in the context of national food security (FAO)*
- *Voluntary guidelines for responsible governance of land, fisheries and forest land regimes in the context of national food security (FAO)*

Chapter 5

Biodiversity Management and Stock Price Crash Risk

ALEXANDER BASSEN, DANIEL BUCHHOLZ, KERSTIN LOPATTA, ANNA R. RUDOLF

5.1 Introduction

Biodiversity loss and its consequences are currently recognized as one of the most urgent risks the world is currently facing (WEF, 2022). Therefore, the objective of this study is to investigate whether financial markets are aware of the biodiversity risks that companies face. In contrast to climate change, which receives significant attention from both investors and financial research (Krueger et al., 2020; Stroebel & Wurgler, 2021), biodiversity issues are not an area of importance for corporate reporting (Adler et al., 2017, 2018), their financial decisions (Nedopil, 2022), or their overall sustainability practices (Schaltegger et al., 2022). This is despite the fact that an estimated 20 percent of the largest publicly traded companies have material risks associated with biodiversity loss and its impacts (de Carvalho et al., 2022). Rather, companies causing significant negative impacts on biodiversity, such as mining, adopt reporting techniques to dilute or play down their negative impacts (Boiral, 2016). Meanwhile, there has been a substantial increase in large publicly traded companies emphasizing their commitment to biodiversity conservation (29 percent of the largest publicly traded companies in 2018), in particular among companies that are more dependent on or have a greater impact on ecosystem services (de Carvalho et al., 2022).

The surveys by Krueger et al. (2020) and Stroebel and Wurgler (2021) show that most institutional investors evaluate climate risks as a material risk factor. For instance, climate risks significantly increase a company's credit default swap (CDS) or bond spreads, both measures for an increased company's risk profile (Kölbel et al., 2020; Seltzer et al., 2022). In contrast to climate change risks, biodiversity risks are harder to grasp due to their high complexity (Schaltegger et al., 2022). Efficient corporate environmental management (i.e., strong environmental performance) mitigates perceived corporate risk by investors and hedges against climate-related risks (El Ghoul et al., 2018; Y. Kim et al., 2014). In analogy, we argue that strong biodiversity management is negatively associated with financial risk. We hypothesize that, due to distinct features of biodiversity risks, strong biodiversity management affects financial risk perceptions. To our knowledge, there is no study to date that addresses the (non)importance of biodiversity risk and its management as a financial risk factor. Thus, this paper is the first to empirically analyze the relationship between a company's actions on reducing its impacts and dependencies on biodiversity and financial risk. We capture financial risk by stock price crash risk, a frequently applied measure to assess the risk of substantial negative stock returns (Habib et al., 2018). In a multivariate analysis, we study whether strong biodiversity management is acknowledged as value preserving by financial markets and whether it can help reduce

a company's risk profile. To measure biodiversity management, we use data from Vigeo Eiris, a subsidiary of the rating agency Moody's. Vigeo Eiris is one of the few data providers collecting yearly data on corporate biodiversity management. Drawing on a global dataset across 45 countries of $1,402$ listed firms, our results indicate that companies with stronger biodiversity management experience a lower risk of significant stock price declines. We use a global dataset as the loss of biodiversity affects companies worldwide. Our results show that the management of biodiversity impacts and dependencies thereof has an important influence on the perception of firms' financial risks, besides overall environmental, social, and governance (ESG) performance. A one standard deviation increase in overall biodiversity management is associated with a decrease of 4.2393 percent and 5.0388 percent for our two measures of stock price crash risk. Moreover, we find that stakeholder feedback on firms' biodiversity management is of special importance for firms in need of legitimacy, i.e. those with low overall ESG performance or low profitability.

In an additional analysis, we look at environmental inspections by the EPA, the US Environmental Protection Agency, as an exogenous shock to the information environment regarding the state of a firm's biodiversity management. In a difference-in-differences design, we find that firms that are subject to an EPA inspection see a significant increase in their stock price crash risk in the year following the inspection. This underlines that a firm's impact on the state of biodiversity around its operating facilities is a potential financial risk factor. We argue that environmental inspections are one channel through which negative information on companies' biodiversity stewardship is revealed to the public.

The contribution of our study is twofold. First, it enhances our understanding of the importance of environmental risk factors for financial markets besides climate change. While climate change and its consequences are currently getting a lot of attention (Giglio et al., 2021; H. Hong et al., 2020), this study underlines that specific environmental risks should not be limited to this one topic. Prior research so far examines how companies value biodiversity itself (Anthony & Morrison–Saunders, 2022), the extent to which they report on biodiversity (Hassan et al., 2022), their commitment to biodiversity (Silva et al., 2019), and the factors that motivate companies to disclose on biodiversity (Hassan et al., 2020). Moreover, de Carvalho et al. (2022) finds that companies exposed to biodiversity-related risks implement policies for biodiversity. Thus, our findings extend these studies on the importance of biodiversity management in financial decision making. By examining the financial consequences of biodiversity management, we open a new strand in the biodiversity disclosure and management literature, which has mainly focused on the importance and determinants of biodiversity disclosure (Boiral & Heras-Saizarbitoria, 2017a, 2017b).

Second, this study adds to the literature analysing how non-financial risk factors influence stock price crash risk. Most of these studies focus only on a subset of industries such as banking or renewable energy (Fiordelisi et al., 2022; Yildiz & Karan, 2020). In contrast, our sample includes a wide range of different industries across multiple countries, all of which have varying relationships and dependencies towards biodiversity. Finally, our study has practical implications for management and investors, as we show that shareholders value the management of biodiversity risks, suggesting that the impacts and dependencies on (intact) ecosystems are a risk factor to consider. Thus, companies should allocate sufficient resources to manage biodiversity risks in order to prevent declines in share price.

The remainder of the paper is structured as follows. The next section reviews prior literature and develops our hypotheses. Section 5.3 presents our methodology and the sample selection procedure. We provide and discuss the results in Section 5.4. Section 5.5 displays additional results and robustness checks. Section 5.6 concludes.

5.2 Hypotheses Development

5.2.1 Biodiversity Loss and Firm Level Risk

Studies by Dasgupta (2021) and de Carvalho et al. (2022) show that the loss of biodiversity poses a significant risk for many companies. Up to now, empirical financial research has not examined the importance of biodiversity (loss) for corporations and its trait as a possible financial risk factor on a firm level. A few studies point out the great variety to which companies report on biodiversity issues (Adler et al., 2017, 2018; Anthony & Morrison–Saunders, 2022), underlining that the attitude of companies towards biodiversity is heterogeneous. These findings are supported by the survey results of Wagner (2022), suggesting that the majority of corporate actions toward safeguarding biodiversity are of symbolic value. Contrary to climate change, biodiversity impacts, dependencies, and actions are harder to grasp and evaluate in corporate reporting due to their high complexity (Schaltegger et al., 2022). Hence, no unifying variable to measure and manage related risks, such as CO_2 emissions (Kennedy et al., 2022), or clear thresholds for intactness exist (Addison et al., 2020).

Nature-related risks, such as the risks arising from biodiversity loss, are distinct from the non-financial risk factors analyzed by prior literature. Most importantly, they depict salient, yet large scale issues. In his assessment of the economics of biodiversity, Dasgupta (2021) defines three nature-related financial risks: physical risks, transition risks, and litigation risks. Firms might be exposed to one, two, or all three of these risks. On

the one hand, many firms are dependent on various types of ecosystem services.[1] For instance, chemical or energy firms might require functioning rivers for cooling their operations, and agricultural firms rely on insects such as bees for the pollination of their crops (*physical risks*). On the other hand, firms are putting pressure on the state of biodiversity through their business operations. For example, mining firms might need to destroy a once thriving area (in terms of biodiversity) to extract resources. Firms might thus be under pressure from civil society or regulatory authorities, i.e., through litigation (*litigation risk*) or through emerging regulation (*transition risks*). This could have various negative consequences, such as threatening a firm's reputation, putting the firm at risk of paying compensation for the damage caused, or even jeopardizing the current business model through legislation. These three types of risks all have distinct negative consequences for a firm's financial position and might lead to an unexpected decline in shareholder value and can thus be considered a financial risk for many companies.

5.2.2 Stock Price Crash Risk and Biodiversity Management

A multitude of studies analyze factors influencing a firm's stock price crash risk, such as tax avoidance (J.-B. Kim et al., 2011), religion (Callen & Fang, 2015), or CEO age (Andreou et al., 2017). J. Chen et al. (2001) conduct the first empirical analysis and find that certain firms, i.e. those who see an increase in trading volume in their common stock, are more likely to be subject to a stock price crash. Besides financial variables influencing a firm's stock price crash risk, non-financial topics are of increasing importance for companies. In their analysis, Y. Kim et al. (2014) find that a firm's ESG performance mitigates stock price crash risk. They attribute this finding to less bad news hoarding by firms with strong ESG performance. Recently, other non-financial risk factors have been examined regarding their influence on stock price crash risk. Yildiz and Karan (2020) find that a country's overall culture towards environmental issues is a predictor of stock price crash risk. The study by Minnick et al. (2022) shows that carbon risk, measured by a firm's total CO_2 emissions, is a factor driving a firm's stock price crash risk. This relationship is attenuated by factors such as the quality of governance or the presence of institutional investors. Yet, non-financial performance is a wide field that goes far beyond climate change risks (measured by CO_2 emissions). In addition, aggregated sustainability performance might not be able to capture all subtopics of potential importance for financial markets. One further factor to consider might be a company's action toward safeguarding biodiversity.

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[1]The IBPES (2022) defines ecosystem services as "the benefits people obtain from ecosystems."

Corporations focusing on managing their impacts and dependencies on biodiversity are indicating that they value intact ecosystems and biodiversity. It signals that they are actively managing the pressures their operations present to biodiversity as well as their dependency on well-functioning ecosystems. These firms intend to reduce their biodiversity risks and thus, we assume, their stock price crash risk. This hypothesis is in line with Christensen (2016), who finds that the negative outfall of non-financial misconduct can be mitigated by firms through disclosure of their ESG activities. Considering the previous literature on stock price crash risk and the distinct properties of biodiversity risks, we posit that stronger biodiversity management decreases stock price crash risk. Hence, we state our first research hypothesis as follows:

Hypothesis 9 (H9)**.** *Strong biodiversity management negatively influences a firm's perceived risk (i.e., stock price crash risk).*

5.2.3 Stakeholder Response to Biodiversity Management and Legitimacy

While overall biodiversity management directly reduces a firm's risk profile, the response by stakeholders to a firms' management and actions towards biodiversity might additionally be of importance to form their exposure of risk (i.e., stock price crash risk). Chiu and Sharfman (2011) show that the visibility of corporate actions to stakeholders is a channel through which firms' legitimacy is influenced. One important reason companies undertake ESG activities is to gain or retain legitimacy. In turn, increased legitimacy has positive financial consequences (Chiu & Sharfman, 2011; Kölbel et al., 2020). If firms fall short in overall ESG performance, they might opt for other possibilities to enhance their legitimacy. In such cases, positive stakeholder feedback on biodiversity management and actions might provide a fall-back option for those companies. Thus, we hypothesize that stakeholder feedback in response to biodiversity management and activities influences a firm's legitimacy and hereby its financial risk (i.e. stock price crash risk). Yet, as biodiversity is only gradually gaining the attention of companies and investors (Adler et al., 2018), we hypothesize that stakeholder feedback to biodiversity management and activities is not of general importance but only for those firms which lack legitimacy in other dimensions (i.e., showing a low overall ESG performance). Thus, we state our second research hypothesis as follows:

Hypothesis 10 (H10)**.** *Stakeholder feedback on biodiversity management reduces shareholder risk perceptions (i.e, negatively influences stock price crash risk) only for companies that have a need for legitimacy.*

5.3 Methodology

5.3.1 Measuring Stock Price Crash Risk

To calculate measures of stock price crash risk, we follow J.-B. Kim et al. (2021) and start by estimating the following regression to estimate firm-specific weekly stock returns:

$$r_{i,\tau} = \alpha_i + \beta_1 r_{m,\tau-2} + \beta_2 r_{m,\tau-1} + \beta_3 r_{m,\tau} + \beta_4 r_{m,\tau+1} + \beta_5 r_{m,\tau+2} + \epsilon_{i,\tau} \qquad (5.1)$$

where $r_{i,\tau}$ depicts the return for firm i during week τ. $r_{m,\tau}$ depicts the market return for week τ. Moreover, we include the market returns two weeks around each week to control for nonsynchronous trading (Dimson, 1979; J.-B. Kim et al., 2021), using the country-specific MSCI index return as a proxy for local market returns. We then define a firm's weekly stock return $W_{i,\tau}$, calculated as the natural logarithm of one plus the residual from Equation 5.1. Following the comprehensive literature on stock price crash risk (Hasan et al., 2021; H. A. Hong et al., 2017; J.-B. Kim et al., 2021), we use two measures for crash risk. The first one, *NCSKEW*, is the negative conditional return skewness, whereas the second, *DUVOL*, captures the down to up volatility. *NCSKEW*, first introduced by J. Chen et al. (2001), is calculated using the negative third moment of a firm's weekly returns during a year and then dividing it by the standard deviation of weekly returns, raised to the third power. We define *NCSKEW* in Equation 5.2. *DUVOL* states asymmetric volatilities by dividing the sum of a firm's squared weekly stock return $W_{i,\tau}$ in down weeks by the sum of all squared weekly returns in up weeks, as defined in Equation 5.3. Following J. Chen et al. (2001), we define up (down) weeks as those weeks, in which the return is greater (smaller) than a firm's average weekly return in the corresponding year. n_u and n_d, respectively, depict the number of up and down weeks within a firm-year. For both variables, higher values indicate higher risk of a stock price crash.

$$NCSKEW_{j,t} = -\frac{n(n-1)^{3/2} \sum W_{j,t}^3}{(n-1)(n-2)\left(\sum W_{j,t}^2\right)^{3/2}} \qquad (5.2)$$

$$DUVOL_{j,t} = ln\left[\frac{(n_u-1)\sum_{DOWN} W_{j,t}^2}{(n_d-1)\sum_{UP} W_{j,t}^2}\right] \qquad (5.3)$$

5.3.2 Empirical Model

We deploy the following regression to test our main hypothesis on the relationship between stock price crash risk and a firm's biodiversity management:

$$
\begin{aligned}
\text{CRASH}_{i,t} = {} & \alpha + \beta_1 \text{BIODIV}_{i,t-1} + \sum_{k=2}^{K} \beta_k \text{CONTROLS}_{k,i,t-1} \\
& + \sum_{c=1}^{C} \tau_c \text{Country}_{c,i} + \sum_{j=1}^{J} \tau_j \text{Industry}_{j,i} + \sum_{t=1}^{T} \psi_t \text{Year}_t + \epsilon_{i,t},
\end{aligned}
\tag{5.4}
$$

where $CRASH_{i,t}$ depicts one of the two measures of stock price crash risk, $NCSKEW_{j,t}$ or $DUVOL_{j,t}$. $BIODIV_{i,t-1}$ depicts our main variable of interest, indicating a firm's overall biodiversity management in the previous year. The overall biodiversity management variable is calculated by averaging all of the three biodiversity subscores provided by Vigeo Eiris. We use the subscores as further variables of interest. First, *Biodiv. Leadership* proxies a firm's overall commitment towards preserving biodiversity indicating for example the existence of clear policies related to the topic and the public visibility thereof. Second, *Biodiv. Implementation* indicates the state of overall implementation of said commitment. The pillar assesses the means allocated to achieving the commitment and the scope of implementation in both geographical as well as operating segments. Finally, *Biodiv. Results* evaluates the results of a firm's ambitions, looking at stakeholder feedback or biodiversity measures. Each of the three biodiversity scores ranges between 0 and 100, with higher values indicating stronger performance. See the studies by Bilbao-Terol et al. (2019) and Cavaco et al. (2020) for a more detailed description of the three-pillar structure established by Vigeo Eiris.

Additionally, we follow J.-B. Kim et al. (2021) and include several control variables that the prior literature identifies to be determinants of stock price crash risk. We include the lagged negative skewness of stock returns ($LAGNCSKEW$), detrended trading volume ($DTURNOVER$), and the standard deviation of weekly returns ($SIGMA$). Furthermore, we include several control variables based on company fundamentals. These are firm size ($SIZE$), market to book ratio (MB), leverage (LEV), and return on assets (ROA). We follow the approach by H. A. Hong et al. (2017) to control for opaqueness ($OPAQUE$). We retrieve all data for stock prices as well as control variables from Refinitiv Datastream. As our sample consists of a global sample of companies from different countries, we convert all currency amounts into USD. As a final control variable, we include a firm's ESG performance (ESG) using Refinitiv ESG data to ensure that the biodiversity variable is not merely a proxy for a firm's overall ESG performance, which Y. Kim et al. (2014) find to be another determinant of stock price crash risk. We winsorize all control variables at

Table 5.1: This table reports descriptions of the variables used in my analysis. The control variables are defined following J.-B. Kim et al. (2021). The subscripts i and t indicate firm- and year-specific variables.

VARIABLES	Definition
Biodiversity$_{i,t}$	Overall biodiversity management score, measured by the Vigeo Eiris ENV1.4 score.
Biodiv. Leadership$_{i,t}$	Score on biodiversity leadership, measured by the corresponding Vigeo Eiris ENV1.4 subscore.
Biodiv. Implementation$_{i,t}$	Performance regarding the implementation of measures aimed at the protection of biodiversity, measured by the corresponding Vigeo Eiris ENV1.4 subscore.
Biodiv. Results$_{i,t}$	Performance regarding stakeholder feedback related to biodiversity management, measured by the corresponding Vigeo Eiris ENV1.4 subscore.
DUVOL$_{i,t}$	Negative conditional firm-specific weekly return skewness, defined as in Equation 5.3.
NCSKEW$_j$	Down to up volatility of firm-specific weekly returns, defined as in Equation 5.2.
LAGNCSKEW$_j$	Lagged value of NCSKEW.
SIGMA$_j$	Weekly return volatility, calculated as the standard deviation of weekly returns over the year.
RET$_{i,t}$	Weekly return, measured as the yearly mean of firm-specific weekly returns.
DTURNOVER$_{i,t}$	Change in monthly turnover, defined as the difference of average monthly share turnover between the current year and the previous year. Monthly share turnover is defined as the monthly trading volume divided by the total number of shares outstanding.
SIZE$_{i,t}$	Natural logarithm of market value of equity for firm i in year t.
MB$_{i,t}$	Market to book ratio, measured as the market value of equity divided by the book value of equity.
LEV$_{i,t}$	Leverage, defined as the total long-term debts divided by total assets.
ROA$_{i,t}$	Return on assets, defined as the income before extraordinary items divided by lagged total assets.
OPAQUE$_{i,t}$	Firm opaqueness, measured as the prior three years' moving sum of the absolute value of discretionary accruals estimated by the model from Hutton et al. (2009).
ESG$_{i,t}$	The total Thomson Reuters ESG Refinitiv score for firm i in year t.

the top and bottom 1 percent level to reduce the possible impact of outliers.[2] Further, we include country and industry fixed effects to control for time invariant specific factors.

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[2]In untabulated analysis, we find that the results are qualitatively similar if we do not winsorize our control variables.

We include year fixed effects to account for temporal events. See Table 5.1 for a detailed overview of the variables included in our analysis.

5.3.3   Sample Selection and Descriptive Statistics

Our sample starts with all companies covered by the Vigeo Eiris biodiversity score worldwide. Vigeo Eiris, a subsidiary of Moody's, is one of the few providers of firm-level biodiversity information. Due to a strong uptake in firms with available data on biodiversity management, we start our sample period in 2009. Overall, our sample covers a time period of 13 years, ending in 2021. We begin with a total of 12,483 observations from 2,230 unique companies. After excluding companies with missing stock price data, missing controls and ESG variables, the sample includes 7,161 observations from 1,402 companies across 45 different countries. Table 5.2 provides detailed steps of the sample selection procedure.

Table 5.3 gives an overview of the distribution of companies across industries (Panel A) and countries (Panel B) included in our sample. Around 18 percent (257 firms) of the companies included in our sample are headquartered in the US, followed by Australia and the United Kingdom with both around 8.2 percent (115 and 114 firms, respectively). Other countries with a high number of companies include Canada (108 firms), Japan (81 firms), and Hong Kong (64 firms).

Table 5.2: This table reports our sample selection procedure. We start with the whole universe for which Vigeo Eiris provides data on biodiversity management. Our sample period spans the years between 2009 and 2021.

		Number of	
		observations	firms
	Biodiversity data	12,483	2,230
-	missing stock price data	142	14
-	missing control data	4,754	696
-	missing ESG data	426	118
=	Sample for baseline analysis	7,161	1,402
-	firms outside North America	5,740	1,037
=	Sample for difference-in-differences analysis	1,691	365

Tables 5.4 and 5.5, respectively, display the summary statistics and pairwise correlation coefficients of the variables used in the baseline analysis. The control variables are generally of similar size and standard deviation compared to other studies on stock price crash risk (J.-B. Kim et al., 2021; Y. Kim et al., 2014). Our size variable is larger than

Table 5.3: This table gives an overview of our sample used for the baseline analysis. Panel A gives an overview of the industry distribution of the companies included in the baseline analysis using the Vigeo Eiris sector classification. Panel B gives an overview of the global distribution of the companies included in the baseline analysis by country of a company's headquarter. Both panels sorted by frequency. For brevity, we display all countries with less than 10 companies as single group (Other). Other includes Austria, Colombia, Czech Republic, Greece, Hungary, Ireland, Israel, the Philippines, Qatar, Turkey, and the United Arab Emirates. For our empirical analyses, we use country fixed effects for all countries, including those with less than 10 companies.

Industry	N	Percent	Country	N	Percent
Electric & Gas Utilities	189	13.48%	United States of America	257	18.33%
Mining & Metals	147	10.49%	Australia	115	8.20%
Food	134	9.56%	United Kingdom	114	8.13%
Pharmaceuticals & Biotechnology	134	9.56%	Canada	108	7.70%
Energy	124	8.84%	Japan	81	5.78%
Specialised Retail	112	7.99%	Hong Kong	64	4.56%
Hotel, Leisure Goods & Services	70	4.99%	China	48	3.42%
Supermarkets	57	4.07%	South Korea	48	3.42%
Beverage	54	3.85%	France	45	3.21%
Heavy Construction	54	3.85%	India	38	2.71%
Oil Equipment & Services	54	3.85%	Italy	32	2.28%
Building Materials	49	3.50%	Brazil	31	2.21%
Financial Services - Real Estate	49	3.50%	Germany	31	2.21%
Forest Products & Paper	37	2.64%	Spain	27	1.93%
Industrial Goods & Services	35	2.50%	South Africa	24	1.71%
Luxury Goods & Cosmetics	34	2.43%	Taiwan	21	1.50%
Chemicals	25	1.78%	Netherlands	20	1.43%
Waste & Water Utilities	17	1.21%	Switzerland	20	1.43%
Tobacco	15	1.07%	Malaysia	19	1.36%
Health Care Equipment & Services	11	0.78%	Sweden	19	1.36%
Travel & Tourism	1	0.07%	Mexico	18	1.28%
Total	1,402	100.00%	New Zealand	16	1.14%
			Chile	15	1.07%
			Indonesia	15	1.07%
			Norway	15	1.07%
			Russia	15	1.07%
			Belgium	14	1.00%
			Denmark	13	0.93%
			Finland	13	0.93%
			Peru	13	0.93%
			Poland	13	0.93%
			Portugal	10	0.71%
			Singapore	10	0.71%
			Thailand	10	0.71%
			Other	50	3.57%
			Total	1,402	100.00%

Panel A: Industries

Panel B: Countries

in other studies analyzing factors influencing stock price crash risk, with a mean market capitalization of 6.7 billion USD. We attribute this to our measure for biodiversity management only being available for large companies. This is in line with other studies employing ESG data (Yildiz & Karan, 2020), as data providers of ESG data frequently focus their attention toward companies with high market capitalization. The average firm shows a market-to-book ratio of 1.82 and a return on assets of 4 percent. The correlation coefficients between our different (sub)scores of biodiversity management are,except for the variable measuring the stakeholder response to biodiversity actions (*Biodiversity Results*), highly correlated with correlation coefficients ranging between 0.64 and 0.88 and statistically significant at the 5 percent level.

Table 5.4: This table reports the summary statistics of the variables deployed in the baseline analysis. We winsorize all control variables at the 1 percent and 99 percent level.

	N	Median	Mean	Std. Dev.	P25	P75
Biodiversity	7,161	28.0000	31.7713	19.3809	14.0000	43.0000
Biodiv. Leadership	7,161	30.0000	31.5353	29.7860	0.0000	52.0000
Biodiv. Implementation	7,161	20.0000	27.3586	28.4442	0.0000	44.0000
Biodiv. Results	7,161	35.0000	36.2955	15.0913	28.0000	35.0000
DUVOL	7,161	0.1137	0.1151	0.7772	-0.3642	0.5923
NCSKEW	7,161	0.1116	0.1256	1.0385	-0.4545	0.6751
LAGNCSKEW	7,161	0.1200	0.1555	0.9485	-0.4356	0.6779
SIGMA	7,161	0.0419	0.0477	0.0237	0.0311	0.0577
RET	7,161	0.1398	0.1361	0.6347	-0.2309	0.5043
DTURNOVER	7,161	0.0000	0.0010	0.0338	-0.0094	0.0098
SIZE	7,161	8.8110	8.8537	1.3873	7.9293	9.7411
MB	7,161	1.8200	2.8646	3.8380	1.1100	3.2100
LEV	7,161	0.2198	0.2313	0.1519	0.1229	0.3235
ROA	7,161	0.0416	0.0512	0.0771	0.0165	0.0810
OPAQUE	7,161	0.7897	0.6464	0.4146	0.5609	0.9064
ESG	7,161	58.9600	56.8385	19.4279	43.6700	72.1100

Table 5.5: This table reports the pairwise correlation coefficients of the variables deployed in the baseline analysis. Significance at the 5% level is indicated by *.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) Biodiversity	1.00															
(2) Biodiv. Leadership	0.88*	1.00														
(3) Biodiv. Implementation	0.88*	0.64*	1.00													
(4) Biodiv. Results	0.47*	0.20*	0.22*	1.00												
(5) DUVOL	-0.02	-0.02*	-0.01	-0.02	1.00											
(6) NCSKEW	-0.02	-0.02	-0.01	-0.02	0.92*	1.00										
(7) LAGNCSKEW	-0.05*	-0.04*	-0.03*	-0.03*	-0.01	-0.00	1.00									
(8) SIGMA	-0.02	-0.04*	-0.03*	0.06*	-0.09*	-0.09*	-0.08*	1.00								
(9) RET	0.03*	0.03*	0.03*	-0.00	0.08*	0.06*	-0.49*	0.03*	1.00							
(10) DTURNOVER	-0.02*	-0.02	-0.02*	-0.00	-0.03*	-0.03*	0.04*	0.29*	-0.07*	1.00						
(11) SIZE	0.28*	0.29*	0.31*	-0.06*	0.08*	0.07*	0.03*	-0.39*	-0.01	-0.05*	1.00					
(12) MB	0.03*	0.04*	0.03*	-0.01	-0.02	-0.01	-0.01	0.07*	-0.01	0.00	-0.04*	1.00				
(13) LEV	0.04*	0.05*	0.03*	0.02	-0.00	-0.00	0.02*	-0.01	-0.04*	0.05*	0.04*	-0.05*	1.00			
(14) ROA	0.03*	0.03*	0.03*	-0.01	-0.02	-0.02	-0.09*	-0.14*	0.21*	-0.05*	0.20*	-0.03*	-0.17*	1.00		
(15) OPAQUE	-0.04*	-0.04*	-0.04*	-0.01	0.01	0.02	0.01	-0.12*	-0.00	-0.02	0.01	0.01	0.04*	0.04*	1.00	
(16) ESG	0.51*	0.50*	0.48*	0.08*	-0.01	0.01	0.01	-0.12*	0.02	-0.01	0.43*	0.02	0.05*	0.07*	-0.03*	1.00

5.4 Results

5.4.1 Biodiversity Management and Stock Price Crash Risk

Tables 5.6 and 5.7 depict the regression results of Equation 5.4 for the two measurements of stock price crash risk (i.e., *DUVOL* and *NCSKEW*). For all our regressions, we report clustered standard errors by firm-level in parentheses below each coefficient. Column 1 in Table 5.6 (Table 5.7) indicates that overall strong biodiversity management is related to a lower stock price crash risk with a coefficient of -0.0017 for *DUVOL* (-0.0027 for *NCSKEW*), statistically significant at the 1 percent level. Both effects are statistically and economically significant. On average, a one standard deviation increase in overall biodiversity management is associated with a decrease of 4.2393 percent in *DUVOL* in the following year.[3] The effect size for *NCSKEW* is of similar magnitude (-5.0388 percent). These results suggest an economically significant negative relationship between biodiversity management and stock price crash risk, supporting our Hypothesis 9. The coefficients of our control variables are in line with other studies in terms of sign and magnitude (J. Chen et al., 2017; J.-B. Kim et al., 2021; Y. Kim et al., 2014). Firms that show higher past returns, greater size, and exhibit a higher return on assets are linked to higher crash risk.

Columns 2 to column 5 in Table 5.6 (Table 5.7) show the results for each of the three subscores of biodiversity management separately. The coefficients on the two subscores indicating *Biodiv. Leadership* and *Biodiv. Implementation* are of the same sign and similar magnitude as the overall biodiversity management variable and are at least statistically significant at the 5 percent level. Interestingly, the coefficient for the *Biodiv. Results* variable, capturing the response of stakeholders, shows no statistical significance at frequently used levels. This provides initial evidence for our Hypothesis 10, indicating that positive stakeholder feedback does not result in a general reduction in stock price crash risk.

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[3]For *Biodiversity*, we obtain the effect size as follows: $\frac{\beta_{Biodiversity} * SD_{Biodiversity}}{SD_{DUVOL}}$, hence: $\frac{-0.0017 * 19.3809}{0.7772} = -4.22$ percent.

Table 5.6: This table reports the results of an OLS estimation of Equation 5.4, regressing the Biodiversity score on DUVOL as one of two different measures of stock price crash risk. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Standard errors clustered at the firm level in parentheses below each coefficient. We winsorize all control variables at the 1 percent and 99 percent level.

VARIABLES	(1) DUVOL	(2) DUVOL	(3) DUVOL	(4) DUVOL
Biodiversity	-0.0017***			
	(0.0006)			
Biodiv. Leadership		-0.0010**		
		(0.0004)		
Biodiv. Implementation			-0.0011***	
			(0.0004)	
Biodiv. Results				-0.0001
				(0.0006)
LAGNCSKEW	0.0229*	0.0233*	0.0232*	0.0242*
	(0.0128)	(0.0128)	(0.0128)	(0.0129)
SIGMA	-2.2474***	-2.2501***	-2.2515***	-2.2632***
	(0.6766)	(0.6767)	(0.6771)	(0.6772)
RET	0.1379***	0.1384***	0.1382***	0.1390***
	(0.0200)	(0.0200)	(0.0200)	(0.0200)
DTURNOVER	-0.0624	-0.0692	-0.0571	-0.0618
	(0.3386)	(0.3387)	(0.3388)	(0.3389)
SIZE	0.0332***	0.0323***	0.0342***	0.0284***
	(0.0101)	(0.0101)	(0.0101)	(0.0100)
MB	0.0036	0.0036	0.0035	0.0036
	(0.0027)	(0.0027)	(0.0027)	(0.0027)
LEV	-0.0778	-0.0788	-0.0821	-0.0825
	(0.0695)	(0.0695)	(0.0694)	(0.0691)
ROA	0.5470***	0.5445***	0.5443***	0.5580***
	(0.1637)	(0.1636)	(0.1636)	(0.1632)
OPAQUE	0.0021	0.0017	0.0025	0.0025
	(0.0224)	(0.0223)	(0.0224)	(0.0224)
ESG	-0.0007	-0.0007	-0.0008	-0.0013**
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Constant	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	7,161	7,161	7,161	7,161
Adjusted R-squared	0.0361	0.0360	0.0360	0.0352

Table 5.7: This table reports the results of an OLS estimation of Equation 5.4, regressing the Biodiversity score on NCSKEW as one of two different measures of stock price crash risk. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Standard errors clustered at the firm level in parentheses below each coefficient. We winsorize all control variables at the 1 percent and 99 percent level.

VARIABLES	(1) NCSKEW	(2) NCSKEW	(3) NCSKEW	(4) NCSKEW
Biodiversity	-0.0027***			
	(0.0008)			
Biodiv. Leadership		-0.0015***		
		(0.0005)		
Biodiv. Implementation			-0.0016***	
			(0.0005)	
Biodiv. Results				-0.0005
				(0.0008)
LAGNCSKEW	0.0314*	0.0319*	0.0320*	0.0333*
	(0.0183)	(0.0182)	(0.0183)	(0.0183)
SIGMA	-3.0135***	-3.0173***	-3.0214***	-3.0371***
	(0.9215)	(0.9229)	(0.9216)	(0.9236)
RET	0.1644***	0.1653***	0.1651***	0.1660***
	(0.0273)	(0.0272)	(0.0273)	(0.0273)
DTURNOVER	-0.1147	-0.1254	-0.1071	-0.1129
	(0.4359)	(0.4363)	(0.4364)	(0.4363)
SIZE	0.0343**	0.0330**	0.0352***	0.0267**
	(0.0133)	(0.0134)	(0.0133)	(0.0133)
MB	0.0021	0.0021	0.0020	0.0022
	(0.0039)	(0.0039)	(0.0039)	(0.0039)
LEV	-0.0227	-0.0243	-0.0296	-0.0290
	(0.0937)	(0.0936)	(0.0935)	(0.0933)
ROA	0.5786**	0.5744**	0.5761**	0.5973***
	(0.2298)	(0.2301)	(0.2300)	(0.2301)
OPAQUE	0.0059	0.0053	0.0066	0.0065
	(0.0286)	(0.0285)	(0.0287)	(0.0287)
ESG	0.0002	0.0001	0.0000	-0.0006
	(0.0009)	(0.0009)	(0.0009)	(0.0008)
Constant	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	7,161	7,161	7,161	7,161
Adjusted R-squared	0.0286	0.0285	0.0283	0.0273

5.4.2 Stakeholder Response to Biodiversity Management and Legitimacy

To test the conditioned relationship between *Biodiv. Results* and stock price crash risk, we turn to an analysis using interaction terms. We calculate interaction terms between the *Biodiv. Results* variable and a set of variables capturing a company's requirement to establish legitimacy. We consider three different dimensions that may have an impact on the need for organizations to establish or maintain their legitimacy. First, if they have weak biodiversity management and implementation, Second, if they have overall weak ESG performance. Third, if they exhibit poor financial performance. Hence, we first include the two other subscores for biodiversity as moderators, as good performance regarding *Biodiv. Results* (i.e., positive stakeholder feedback) might only be of importance for a subgroup of firms (i.e. those with low implementation of their actions towards biodiversity). To capture overall ESG performance, we include the overall ESG score. In the case of weak overall ESG performance, stakeholder feedback for certain topics (e.g. biodiversity) may gain importance. The same applies to financial performance, which we capture with a proxy for profitability, the return on assets.

For the analysis, we calculate the interactions between *Biodiv. Results* and a set of dummy variables. The dummy variable (i.e., *Low Biodiv. Leadership*) is equal to one if the value for the variable (i.e., *Biodiv. Leadership*) is smaller than the corresponding sample median, zero otherwise.[4] We use this approach for all interaction terms accordingly.

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[4]Again, note that the results are qualitatively unchanged if we form the two groups based on yearly median values (untabulated).

Table 5.8: This table reports the results of an OLS estimation, regressing the score capturing stakeholder feedback on biodiversity management on DUVOL and NCSKEW as our two different measures of stock price crash risk. We add interaction terms between the Biodiversity Results score and several dummy variables. We assign the dummy variable (i.e., Low Biodiv. Leadership) a value of one if the value of a firm-year observation (i.e., in terms of Biodiv. Leadership) is smaller than the median value of this variable in our whole sample, and zero otherwise. We include all control variables used in the main regression (Table 5.6 and Table 5.7). Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Standard errors clustered at the firm level in parentheses below each coefficient. We winsorize all control variables at the 1 percent and 99 percent level.

VARIABLES	(1) DUVOL	(2) NCSKEW	(3) DUVOL	(4) NCSKEW	(5) DUVOL	(6) NCSKEW	(7) DUVOL	(8) NCSKEW
Biodiv. Results (X)	0.0002	0.0000	0.0005	0.0003	0.0004	0.0001	0.0004	0.0004
	(0.0007)	(0.0009)	(0.0006)	(0.0009)	(0.0006)	(0.0009)	(0.0007)	(0.0009)
Biodiv. Leadership	-0.0012**	-0.0016**						
	(0.0005)	(0.0007)						
Biodiv. Implementation			-0.0016***	-0.0022***				
			(0.0005)	(0.0007)				
Interaction term (below median)								
X * Low Biodiv. Leadership	-0.0004	-0.0002						
	(0.0007)	(0.0010)						
X * Low Biodiv. Implementation			-0.0009	-0.0010				
			(0.0008)	(0.0010)				
X * Low ROA					-0.0013**	-0.0014*		
					(0.0006)	(0.0008)		
X * Low ESG							-0.0017**	-0.0025**
							(0.0008)	(0.0011)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	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
Observations	7,161	7,161	7,161	7,161	7,161	7,161	7,161	7,161
Adjusted R-squared	0.0358	0.0282	0.0360	0.0282	0.0356	0.0276	0.0357	0.0281

Table 5.8, columns 1 to 4 regress our two measures of stock price crash risk on interaction terms between *Biodiv. Results* and dummy variables derived from the two other subscores of biodiversity management. None of the four interaction terms is statistically significant at the 10 percent level or lower, indicating that stakeholder feedback is not more important for firms with low biodiversity management (implementation). Columns 5 to 8 show that the interaction terms between *Biodiv. Results* and *ROA* (*ESG*) are negative and statistically significant at the 10 percent (5 percent) level. This indicates that strong performance regarding *Biodiv. Results* (i.e., good stakeholder feedback) is of special importance to the financial risk position of firms with low financial (ESG) performance. Firms with low ESG performance might derive a high marginal utility from good biodiversity management as they do not benefit from the risk reducing effects of strong ESG performance (Godfrey et al., 2009; Y. Kim et al., 2014). Similarly, firms with low financial performance (i.e., low return on assets) might focus on strong management of biodiversity to gain or maintain their legitimacy. Overall, the results provide support for our Hypothesis 10.

5.5 Additional Analysis

5.5.1 Environmental Inspections and Stock Price Crash Risk

Building on the above results indicating that biodiversity management reduces the risk of sudden stock price declines, we attempt to establish a causal relationship in this section. Following agency theory (Jensen & Meckling, 1976), the majority of studies on stock price crash risk attribute the occurrence of a sudden drop in share price primarily to bad news hoarding as a consequence of failure of corporate governance mechanisms (Hutton et al., 2009). These failures lead to an asymmetric information environment between management and outside stakeholders. In such a case, managers may withhold negative information through reduced transparency for personal benefits, such as empire building or higher compensation (Ball, 2009; Graham et al., 2005). Negative information stockpiles and is eventually released all at once after the management is no longer able to withhold it (J.-B. Kim et al., 2021). This revelation of bad news is then the trigger for a sudden decline in share price, a stock price crash. Emerging areas of importance for companies, such as ESG issues, are a particular area of high information asymmetry, as they frequently do not yet have established and standardized disclosure practices (Schiemann & Sakhel, 2019). Particularly, corporate reporting on biodiversity issues is one of these emerging topics. Several studies analyze firms' disclosure and find that even the world's largest companies

or those operating in industries with high impacts or dependencies on biodiversity, such as mining, only provide limited information on biodiversity risks (Adler et al., 2018; Boiral, 2016; Hassan et al., 2020; Rimmel & Jonäll, 2013). Due to the high information asymmetry between managers and outside stakeholders, this opaque environment is well suited for the hoarding of negative information related to biodiversity and ecosystem services.

Besides transparency towards these issues, such as through strong biodiversity management, one possible factor attenuating the extent of information asymmetry are functioning internal and external control mechanisms. Prior studies show that internal and external controls have distinct influence on the information environment and subsequent stock price crash risk (J. Chen et al., 2017; J.-B. Kim et al., 2011, 2020). Especially inspections carried out by governmental agencies might detect the existence of bad information within a company (Zhang et al., 2021), leading to a subsequent release of this news and a corresponding reaction from shareholders.

In consequence, we analyze whether environmental inspections of corporate facilities are one of the channels through which stockpiled bad news is uncovered and subsequently made public. For the analysis, we focus on firms within the US as we require data from the EPA. This is a federal agency charged, among other tasks, with the oversight of the compliance of possibly polluting facilities operated across the US. The EPA publishes extensive data on these polluting facilities and whether the EPA conducted an inspection.[5]. Additionally, we keep Canadian firms, as they also frequently operate facilities in the neighboring US. Overall, the EPA lists $62,048$ facilities with a valid id out of which the majority ($41,426$) were at least once subject to an inspection. It is noteworthy that the EPA only publishes the date of the most recent inspection for each facility.[6] Thus, it is not possible to identify whether a facility was subject to a prior inspection. To mitigate this shortcoming, we aggregate the data on a firm level and use the earliest year any facility of one of the sample companies was subject to an EPA inspection as a treatment for the release of negative information on biodiversity management to the stock market. Moreover, the omission of inspections prior to the most recent inspections on a facility level only works against us finding any results as negative biodiversity information might have been revealed through the earlier inspection, reducing the effect of the latter. As only a small subset of facilities is inspected by the EPA each year, inspections come as a surprise for investors. Thus, we use the event of an environmental inspection as a quasi-natural experiment where some of our sample companies receive a treatment. Overall,

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[5]See the study by S.-H. Kim (2015) who uses EPA inspections in their study for a detailed description of the EPA processes

[6]For more information on the EPA's inspection guidelines and procedures, please see https://www.epa.gov/enforcement/federal-facilities-inspections-guide-epas-access-and-inspection-authorities

the sample for the difference-in-differences analysis includes $1,701$ observations and 365 unique firms which were subject to a total of 704 inspections between 2010 and 2021. While our dataset for the baseline analysis starts in 2009, we only consider inspections starting in 2010 as we require one prior year without any inspection for propensity score matching. As only a minority of firms were subject to inspections (we identify a total of 57 companies as treated firms), we use a propensity score matching approach to create a balanced sample of treatment and control firms. We match treatment and control firms using a logit model with a binary variable equal to one for treated firms and equal to zero for control firms as dependent variable and a firm's leverage and past stock returns as independent variable to find the closest match in terms of financial health. We use data one year prior to the first inspection year for the matching approach (Caliendo & Kopeinig, 2008). After matching each treated firm to a corresponding control firm, we use a 3-year period around each treatment (i.e., first time inspection) to analyze the effect of EPA inspections on stock price crash risk. Due to data restrictions for either treated or control firms, the difference-in-differences sample includes 301 observations (instead of the expected 342).

Table 5.9 depicts the sample means for the difference-in-differences sample split across the assignment to treatment or control group one year prior to each treatment. As indicated by the results of a t-test in the outright column, the majority of means of the control variables do not differ across the two groups, which indicates a good fit for our matching approach.

The variable of interest in a difference-in-differences regression is the interaction term $Treat * Post$, which is equal to one for treated firms in the years subsequent to the treatment (in this case, the first EPA inspection), and zero for all other observations. Table 5.10 contains the results of the difference-in-differences regression on the two measurements of stock price crash risk. We include all control variables used in our main analysis.[7] As expected, the interaction term is positive and statistically significant, indicating that EPA inspections increase a firm's stock price crash risk, likely through the revelation of negative information on a firm's biodiversity activities.

5.5.2   Industry-level Risk

The fallout arising from biodiversity loss and lapse of ecosystem services is not evenly distributed across industries. Primary industries, i.e. those which directly rely on natural

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[7]Note that we do not include country fixed effects as the sample for the difference-in-differences design only includes companies from two countries. The results remain unchanged if we include country fixed effects for the analysis.

Table 5.9: This table provides a summary of the variables used in the difference-in-differences regression for both treatment and control firms one year prior to the respective merger. Firms are assigned to the treatment group if their facilities are subject to an inspection by the US environmental protection agency (EPA). The potential control group consists of all firms that had no inspection during the entire sample period. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

	Treatment group		Control group		
Variables	N	Mean	N	Mean	Diff
DUVOL	57	0.3671	57	0.4103	-0.0432
NCSKEW	57	0.4355	57	0.4448	-0.0092
LAGNCSKEW	57	0.4773	57	0.2604	0.2169
SIGMA	57	0.031	57	0.0388	-0.0077***
RET	57	0.0782	57	0.0985	-0.0203
DTURNOVER	57	-0.0056	57	0.0006	-0.0062
SIZE	57	10.0193	57	9.3377	0.6816***
MB	57	3.7768	57	3.3574	0.4195
LEV	57	0.3037	57	0.3035	0.0002
ROA	57	0.0791	57	0.0661	0.013
OPAQUE	57	0.5852	57	0.7467	-0.1615**
ESG	57	61.9253	57	47.013	14.9123***

Table 5.10: This table reports the results of a difference-in-differences estimation using a propensity score matched sample. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Robust standard errors are reported in parentheses below each coefficient. We winsorize all control variables at the 1 percent and 99 percent level.

	(1)	(2)
VARIABLES	NCSKEW	DUVOL
Post	-0.4779**	-0.3681**
	(0.2241)	(0.1506)
Treat*Post	0.4481*	0.3352*
	(0.2682)	(0.1810)
Treat	-0.0629	-0.0717
	(0.2011)	(0.1413)
Constant	Yes	Yes
Controls	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	301	301
Adjusted R-squared	0.0742	0.1199

resources as input for their production processes, are much more at risk than secondary industries with less direct overlap with nature (de Carvalho et al., 2022; Wagner, 2022). We thus turn to an analysis, where we differentiate firms by their exposure to biodiversity risks by following the approach of Rimmel and Jonäll (2013) and Adler et al. (2018). Both studies rely on the classification approach by F&C Asset Management (2004) into industries with red (high), amber (medium), and green (low) risks regarding biodiversity. We assign a dummy variable a value of one if a company is considered to be active in a red industry.[8] Overall, around 62 percent (4, 446) companies are operating in industries with high biodiversity risks. Table 5.11 presents the results. The interaction terms on the overall measure of biodiversity management are only statistically significant for the *DUVOL* measure. Thus, the results only show weak indication of biodiversity management being of greater importance for the financial risk of companies operating in high risk industries. Only the interaction term derived from *Biodiv. Implementation* and the dummy variable indicating high risk industries seem to positively influence a firm's stock price crash risk across our two measures of stock price crash risk. This indicates that the risk-reducing effect of strong *Biodiv. Implementation* is less pronounced for firms operating in high risk industries.

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[8]Note that F&C Asset Management (2004) uses the FTSE industry classification, whereas we use the industry classification provided by Vigeo Eiris, see Panel B of Table 5.3. Specifically, we set the dummy variable for a company equal to one if it is active in one of the following industries: Heavy Construction, Electric & Gas Utilities, Food, Forest Products & Paper, Hotel, Leisure Goods & Services, Mining & Metals, Oil Equipment & Services, Waste & Water Utilities, Energy.

Table 5.11: This table reports the results of an OLS estimation, regressing our measures of biodiversity management on our two different measures of stock price crash risk, DUVOL and NCSKEW. We add interaction terms between the biodiversity management (sub)scores and a dummy variables indicating sectors at high risk regarding biodiversity loss. We assign the dummy variable a value of one if the company is active in a red zone sector, defined by F&C Asset Management (2004), and zero otherwise. We include all control variables used in the main regression (Table 5.6 and Table 5.7). Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively. Standard errors clustered at the firm level in parentheses below each coefficient. We winsorize all control variables at the 1 percent and 99 percent level.

VARIABLES	(1) DUVOL	(2) NCSKEW	(3) DUVOL	(4) NCSKEW	(5) DUVOL	(6) NCSKEW	(7) DUVOL	(8) NCSKEW
High Risk	0.0736	0.1161	0.0939	0.1290	0.0991	0.1348	0.0798	0.1301
	(0.1003)	(0.1254)	(0.0972)	(0.1213)	(0.0954)	(0.1187)	(0.1066)	(0.1329)
Biodiversity	-0.0027***	-0.0036***						
	(0.0008)	(0.0011)						
Biodiv. Leadership			-0.0015***	-0.0020**				
			(0.0006)	(0.0008)				
Biodiv. Implementation					-0.0020***	-0.0025***		
					(0.0005)	(0.0008)		
Biodiv. Results							-0.0007	-0.0008
							(0.0009)	(0.0013)
Interaction term (high risk industry)								
High Risk * Biodiversity	0.0018*	0.0017						
	(0.0010)	(0.0014)						
High Risk * Biodiv. Leadership			0.0008	0.0008				
			(0.0007)	(0.0009)				
High Risk * Biodiv. Implementation					0.0016**	0.0017*		
					(0.0007)	(0.0010)		
High Risk * Biodiv. Results							0.0010	0.0006
							(0.0013)	(0.0017)
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	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
Observations	7,161	7,161	7,161	7,161	7,161	7,161	7,161	7,161
Adjusted R-squared	0.0364	0.0287	0.0361	0.0284	0.0365	0.0286	0.0351	0.0272

5.5.3   Robustness Tests

In this section, we perform a battery of robustness tests (untabulated, tables are available on request) to provide further support to our results. Table 5.5 shows high correlation coefficients between our control variable capturing overall ESG performance and our measures for biodiversity management. Correlation ranges between 0.51 for the overall measure of biodiversity management and 0.50 (0.48) for the variable indicating biodiversity leadership (implementation). To rule out that this correlation influences our findings, we rerun our regressions without controlling for overall ESG performance. Our results show, that the coefficients for our variables of interest remain unchanged in terms of magnitude and statistical significance, giving further support to Hypothesis 9.[9]

Second, we tackle the concern that overall biodiversity management might simply be a proxy of (i.e., highly correlated to) a company's overall disclosure quality or its awareness toward emerging ESG issues. As the issue of biodiversity loss is currently not of importance for many companies, firms with strong biodiversity management might simply be those which show high awareness of overall ESG issues and potentially drive our results. To alleviate this concern, we add a further control variable on companies' awareness of ESG issues. We retrieve information on whether companies have policies in place to address ESG issues, using data from Refinitiv. Overall, we collect information on 17 different ESG topics.[10]. From this data, we construct a variable depicting the share of sustainability policies a firm has in place (i.e., if a company has policies for all 17 topics the variable is equal to 1, if the company has no policies in place the variable is equal to 0). We lose 293 observations compared to the baseline sample for which Refinitiv does not provide information on ESG policies. We add the variable as an additional control to our baseline regression and find that our results remain unchanged. This further strengthens our results by providing evidence that our variable on biodiversity management does not merely measure a company's overall awareness of emerging ESG issues.

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[9]The only two submetrics related to biodiversity included in the calculation of the Refinitiv ESG score are the items ENERDP019 and ENPIO10V. Both are yes/no questions and only constitute to the overall ESG score to a very limited extent.

[10]Following the classification of ESG topics by Christensen (2016), we collect the following variables (Refinitiv codes in brackets): Society (SOCODP0067, SOCODP0066, SOCODP0069), product responsibility (SOPRDP0121, SOPRDP0124, SOPRDP0126, SOPRDP0128), labor (SODODP0081, SOHSD01V, SOTDD01V), human rights (SOHRD01V), environment (ENERDP0051, ENRRD01V, ENRRDP0121, ENRRDP0122, ENRRDP0124, ENRRDP0125)

5.6   Conclusion

The economic value of ecosystem services provided by intact biodiversity is undisputed on a societal level (Dasgupta, 2021). Capturing perceived financial risk by stock price crash risk, this paper looks at the importance of biodiversity management on a firm level. We construct a global sample of listed companies and find that strong biodiversity management decreases stock price crash risk. In our analysis, we control for a multitude of different variables which prior literature finds to be determinants of crash risk and deploy several robustness checks to strengthen our findings. Thereafter, we use interaction analysis to test which set of companies stakeholder feedback toward biodiversity management and actions is of importance. We find that those firms that are in the need to build and maintain legitimacy, i.e. those with low overall ESG performance and low profitability, see a decrease in their stock price crash risk through better stakeholder feedback on their biodiversity management and activities.

One step further, we use environmental inspections by the EPA as quasi-natural experiments which we hypothesize to serve as a channel for the revelation of negative information on biodiversity management. A difference-in-differences regression on a propensity score matched sample shows which firms which are subject to an inspection by the EPA see an increase in their stock price crash risk. The results suggest a causal effect of biodiversity management on stock price crash risk, further supporting our main results.

Our paper contributes to our understanding of how non-financial risk factors influence companies' financial risks, adding to studies by Y. Kim et al. (2014) and Zhang et al. (2021). Moreover, our results guide corporate management by showing the importance of allocating sufficient resources towards actions preserving biodiversity to reduce a firm's financial risk. Companies should proactively approach emerging issues in order to avoid negative financial consequences for abstaining from action.

This paper has several limitations. Most importantly, we are not able to apply firm fixed effects due to a low variation of our variables of interest within firms. Incorporating firm fixed effects would capture time invariant firm characteristics and would provide further support to our results. The median (mean) standard deviation of our *Biodiversity* variable within firms is equal to 5.8189 (6.4733), which is substantially lower than the standard deviation across our whole sample. The low standard deviation indicates that biodiversity management is rather consistent across time on a firm level. However, we use a high number of control variables in addition to industry and year fixed effects to alleviate this concern as much as possible. One further caveat of this paper is that we rely on third-party data to measure biodiversity management. The factors influencing biodi-

versity degradation and how companies put pressure on local and global biodiversity are inherently complex and difficult to measure (Schaltegger et al., 2022). A high complexity is put up as one of the reasons why companies' responses to the loss in biodiversity has thus far been considered heterogeneous and often only of symbolic value. With no good indicator to measure a company's impact on biodiversity (compared to CO_2 emissions in the case of climate change), all existing variables are proxies at best. Future studies might use other indicators for corporate biodiversity management and the outcome thereof or develop new measurements themselves.

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Chapter 6

Summary of Publications and Declarations

6.1 Short Summary of Articles

The Effect of Institutional Dual Holdings on CSR Performance

Kerstin Lopatta, Alexander Bassen, Thomas Kaspereit, Sebastian A. Tideman, Daniel Buchholz

Abstract in English: This study sheds light on agency conflicts between creditors and shareholders and their effect on a firm's corporate social responsibility (CSR) performance. We find that the presence of institutional investors which simultaneously hold debt and equity claims in the same firm, so-called dual holders, leads to an increase in CSR performance by the firm that is dual-held (the dual holding firm). Using institutional mergers between separate lenders and equity holders as a natural experiment involving the shareholder-creditor conflict, we find that firms which exhibit dual ownership for the first time increase their CSR activities to a greater extent than a matched control group. In line with the previous literature, we interpret our findings as evidence that dual holders internalise agency conflicts. Thus, we find that a reduction in agency conflicts between creditors and shareholders, partly achieved by dual holders, positively affects the CSR activities of dual holdings.

Abstract in German: Diese Studie beleuchtet Agency-Konflikte zwischen Gläubigern und Anteilseignern und deren Auswirkungen auf die Corporate Social Responsibility (CSR)-Performance eines Unternehmens. Wir stellen fest, dass die Anwesenheit von institutionellen Investoren, die gleichzeitig Fremd- und Eigenkapitalforderungen in derselben Firma halten, sogenannte Dual Holder, zu einer Steigerung der CSR-Leistung der Firma (der sogenannten Dual Holding Firm) führt. Indem wir institutionelle Unternehmenszusammenschlüsse zwischen separaten Kreditgebern und Anteilseignern als natürliches Experiment zur Lösung des Aktionär-Gläubiger-Konflikt verwenden, stellen wir fest, dass Unternehmen, die zum ersten Mal einen Dual Holder aufweisen, ihre CSR-Aktivitäten in größerem Umfang steigern als eine entsprechende Kontrollgruppe. Im Einklang mit der bisherigen Literatur interpretieren wir unsere Befunde als Beleg dafür, dass Dual Holder Handlungskonflikte internalisieren. Daher stellen wir fest, dass eine Verringerung der Vertretungskonflikte zwischen Gläubigern und Aktionären, die teilweise von Dual Holder erreicht wird, die CSR-Aktivitäten von Dual Holdings positiv beeinflusst.

Current status: Published in the Journal of Sustainable Finance & Investment

The Capital Market Impact of Blackrock's Thermal Coal Divestment Announcement

Alexander Bassen, Thomas Kaspereit, Daniel Buchholz

Abstract in English: This study examines how coal companies were affected by the announcement of thermal coal divestment made by Blackrock, a large institutional asset manager. Following the announcement, the largest thermal coal mining companies exhibited negative abnormal returns. However, the stock prices of other firms were not affected. Blackrock's own share price increased following the announcement. We provide additional evidence that Blackrock protected its clients by lowering its exposure towards affected companies before the announcement. Overall, our results show that divestment has significant impacts on the companies in question and that the capital market sees divestment as value-enhancing for the divesting institution.

Abstract in German: Diese Studie untersucht, wie Kohleunternehmen von der Ankündigung des Divestments aus Kraftwerkskohle durch Blackrock, einem großen institutionellen Vermögensverwalter, betroffen waren. Nach der Ankündigung wiesen die größten thermischen Kohlebergbauunternehmen negative anormale Renditen auf. Die Aktienkurse anderer Unternehmen waren jedoch nicht betroffen. Der Aktienkurs von Blackrock stieg nach der Ankündigung. Wir liefern zusätzliche Beweise dafür, dass Blackrock seine Kunden geschützt hat, indem es sein Engagement gegenüber betroffenen Unternehmen vor der Ankündigung verringert hat. Insgesamt zeigen unsere Ergebnisse, dass Divestments erhebliche Auswirkungen auf die betroffenen Unternehmen haben und der Kapitalmarkt Divestments als wertsteigernd für das veräußernde Institut ansieht.

Current status: Published in Finance Research Letters

The Boundaries of Corporate Mens Rea: The Case of Human Rights Litigation

Daniel Buchholz

Abstract in English: This study deepens our understanding of how investors perceive corporate mens rea in the context of corporate irresponsibility. We argue that investors might require specific precautionary actions, such as specific policies, to assume a lack of corporate mens rea. Such policies might signal that an adverse incident is the consequence of chance rather than negligence (i.e., a lack of corporate mens rea). However, performing better in CSR overall could be insufficient to mitigate a perceived corporate mens rea. Even worse, investors might be worried about similar litigation cases in other CSR areas. Using 77 human rights litigation lawsuits (77 unique defendants), we provide empirical evidence that negative capital market reactions are more (less) pronounced for firms with better CSR (with a human rights policy).

Abstract in German: Diese Studie vertieft unser Verständnis darüber, wie Anleger Verantwortungsbewusstsein von Unternehmen im Zusammenhang mit unternehmerischer Verantwortungslosigkeit wahrnehmen. Wir argumentieren, dass Anleger möglicherweise bestimmte Vorsichtsmaßnahmen, wie z. B. bestimmte Richtlinien, benötigen, um von einem Mangel an Verantwortungsbewusstsein des Unternehmens auszugehen. Solche Maßnahmen könnten signalisieren, dass ein negativer Vorfall die Folge eines Zufalls und nicht von Fahrlässigkeit ist (d.h. ein Mangel an Verantwortungsbewusstsein des Unternehmens). Eine insgesamt bessere CSR-Leistung könnte jedoch nicht ausreichen, um den Eindruck eines fehlenden Verschuldens des Unternehmens zu entkräften. Vielmehr könnten die Anleger sich Sorgen über ähnliche Rechtsstreitigkeiten in anderen CSR-Bereichen machen. Anhand von 77 Menschenrechtsklagen (77 einzelne Beklagte) können wir empirisch nachweisen, dass negative Kapitalmarktreaktionen bei Unternehmen mit besserer CSR (mit einer Menschenrechtsrichtlinie) stärker (weniger) ausgeprägt sind.

Current status: Working paper

Biodiversity Management and Stock Price Crash Risk

Alexander Bassen, Daniel Buchholz, Kerstin Lopatta, Anna R. Rudolf

Abstract in English: This study examines the relationship between corporate biodiversity management and financial risk. While the increasing loss of biodiversity and ecosystem services is seen as an important risk factor on a societal level, the financial consequences of these risks on a company level have thus far been neglected by empirical financial research. We posit that strong corporate actions towards preserving biodiversity reduces firms' financial risks. Using a global sample and novel data on firm's biodiversity management, our results show that companies with stronger structures, implementations, and actions on biodiversity management see a decline in stock price crash risk. In an additional analysis, we focus on environmental inspections as a possible way through which negative information on biodiversity management is released. Using a subsample of North American firms, we find that firms which see an inspection of their facilities see an increase in their stock price crash risk.

Abstract in German: Die vorliegende Studie untersucht den Zusammenhang zwischen unternehmerischem Biodiversitätsmanagement und finanziellem Risiko. Während der zunehmende Verlust von Biodiversität und Ökosystemleistungen auf gesellschaftlicher Ebene als wichtiger Risikofaktor angesehen wird, wurden die finanziellen Folgen dieser Risiken auf Unternehmensebene in der empirischen Forschung bisher vernachlässigt. Wir gehen davon aus, dass ein starkes unternehmerisches Engagement für den Erhalt der biologischen Vielfalt die finanziellen Risiken der Unternehmen verringert. Unter Verwendung einer globalen Stichprobe und eines neuartigen Datensatzes zum Biodiversitätsmanagement von Unternehmen zeigen unsere Ergebnisse, dass Unternehmen mit stärkeren Strukturen, Umsetzungen und Maßnahmen zum Biodiversitätsmanagement ein geringeres Risiko eines Aktienkursabsturzes aufweisen. In einer weiteren Analyse konzentrieren wir uns auf Umweltinspektionen als einen möglichen Weg, auf dem negative Informationen über das Biodiversitätsmanagement veröffentlicht werden. Anhand einer Teilstichprobe nordamerikanischer Unternehmen stellen wir fest, dass bei Unternehmen, die eine Inspektion ihrer Anlagen erleben, das Risiko eines Aktienkursabsturzes steigt.

Current status: Working paper

6.2 Statutory Declaration (§6 (6) PromO)

Erklärung

Hiermit erkläre ich, Daniel Buchholz, dass ich keine kommerzielle Promotionsberatung in Anspruch genommen habe. Die Arbeit wurde nicht schon einmal in einem früheren Promotionsverfahren angenommen oder als ungenügend beurteilt.

_____	_____
Ort/Datum	Unterschrift

Eidesstattliche Versicherung

Ich, Daniel Buchholz, versichere an Eides statt, dass ich die Dissertation mit dem Titel "Sustainability in Finance — Real Effects and Capital Market Consequences" selbst und bei einer Zusammenarbeit mit anderen Wissenschaftlerinnen oder Wissenschaftlern gemäß den beigefügten Darlegungen nach § 6 Abs. 3 der Promotionsordnung der Fakultät Wirtschafts - und Sozialwissenschaften vom 18. Januar 2017 verfasst habe. Andere als die angegebenen Hilfsmittel habe ich nicht benutzt.

_____	_____
Ort/Datum	Unterschrift

6.3 Statement of Personal Contribution (§6 (3) PromO)

In the table below, I set out to what extent I contributed to the articles contained in this dissertation. The categories are taken from PromO, the extent to which I contributed are outlined based on the following scale:

My own contribution is $0\% - 33\%$: C

My own contribution is $34\% - 66\%$: B

My own contribution is $67\% - 100\%$: A

Chapter	Details	
	The Effect of Institutional Dual Holdings on CSR Performance	
	Lopatta, Bassen, Kaspereit, Tideman, Buchholz	
2	Theory and Design	C
	Empirical Execution	B
	Preparation of Manuscript	A
	The Capital Market Impact of Blackrock's Thermal Coal Divestment Announcement	
	Bassen, Kaspereit, Buchholz	
3	Theory and Design	B
	Empirical Execution	A
	Preparation of Manuscript	A
	The Boundaries of Corporate Mens Rea: The Case of Human Rights Litigation	
	Buchholz	
4	Theory and Design	A
	Empirical Execution	A
	Preparation of Manuscript	A
	Biodiversity Management and Stock Price Crash Risk	
	Bassen, Buchholz, Lopatta, Rudolf	
5	Theory and Design	B
	Empirical Execution	A
	Preparation of Manuscript	B

6.4   Publication Status (§6 (7) PromO)

This table reports the publication status of the papers presented in this thesis.

Chapter	Details
2	**The Effect of Institutional Dual Holdings on CSR Performance** *Lopatta, Bassen, Kaspereit, Tideman, Buchholz* Published in the Journal of Sustainable Finance & Investment https://doi.org/10.1080/20430795.2020.1776535
3	**The Capital Market Impact of Blackrock's Thermal Coal Divestment Announcement** *Bassen, Kaspereit, Buchholz* Published in Finance Research Letters https://doi.org/10.1016/j.frl.2020.101874
4	**The Boundaries of Corporate Mens Rea: The Case of Human Rights Litigation** *Buchholz* Working paper
5	**Biodiversity Management and Stock Price Crash Risk** *Bassen, Buchholz, Lopatta, Rudolf* Working paper