On the link between shareholder and corporate social responsibility

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1 Introduction

1.1 Motivation

With recently published draft amendments[1] to the Markets in Financial Instruments Directive[2] (MiFID II), the European Commission is one of the first supranational authorities to strive for the regulatory integration of sustainability risks and factors in investment advisory and asset management processes. As part of the so-called European Green Deal, as well as in line with the adoption of the Paris Climate Agreement and the United Nations 2030 Agenda for Sustainable Development Goals (SDG), the initiative aims to use the financial system to support the transformation of the economy into a greener, more resilient and circular system (European Commission, 2020a). Albeit to a lesser mandatory degree, government efforts to utilize the financial system as a "catalyst" for sustainable development are also emerging outside the European Union.[3] Besides regulatory efforts, voluntary initiatives by institutional investors, such as the Portfolio Decarbonization Coalition (PDC) or the Principles for Responsible Investors (PRI), have been launched in recent years to encourage the consideration of environmental, social, and governance (ESG) criteria in portfolio management. Also, equity investors are increasingly using the influence associated with their ownership shares to engage investee firms on ESG-related topics (e.g., Goldstein, 2014). The instrumentalization of dogmatically risk-/return-focused processes in terms of sustainable prosperity as well as the

[1] Draft Commission Delegated Regulation (EU) Ares(2020)2955205.
[2] Delegated Regulation (EU) 2017/565 and Delegated Directive (EU) 2017/593.
[3] For example, the regulations organized at the federal level in the United States [such as the Illinois Sustainable Investing Act (IGA, 2020), the proposed Massachusetts Act Promoting Sustainable Investment, Economic Security And Fiscal Responsibility With Respect To Climate Risks (TCOM, 2020)], Japan's Principles for Responsible Institutional Investors (TSESC, 2017), and the United Kingdom's Stewardship Code (FRC, 2020), among others.

interrelated consequences for investors and corporations offer a broad basis for academic discussion.

The fiduciary duty of asset managers to act in the best interest of their beneficiaries expediently implies the protection of financial wealth. It is therefore hardly surprising that an intensive debate is focusing on the question of whether the consideration of ESG criteria conflicts with this obligation. However, empirical results on the link between sustainable investing and risk-adjusted returns show contradictory results.[4] In contrast, the implications with regard to a specific subcategory of sustainability issues, i.e. the carbon intensity, are quite consistent. According to this, several studies (e.g., Busch and Hoffmann, 2011, Oestreich and Tsiakas, 2015, and Goergen et al., 2020) indicate that considering carbon risk would be equivalent to complying with rather than violating fiduciary duty.[5] Chapter 2 is based on this deduction and examines the carbon risk exposure of different investor types. Complementary, the analysis of ownership structures also reveals the potential of these investor types to influence corporate carbon management according to their (risk) preferences. Apart from executing shareholder rights, Chapter 3 discusses a second option for a preferred reduction of carbon risk exposure, the so-called portfolio decarbonization.

From a societal perspective, however, the operationalization of ESG integration in asset management can ultimately only be regarded as successful if it has an impact on corporations, or more precisely on corporate social responsibility (CSR). In this context, several studies (e.g., Lamb and Butler, 2016, and Villalonga, 2018) suggest that investors, and thus corporate owners, suspected of considering sustainability issues, encourage their firms' responsible behavior. One difficulty in empirically testing such assumptions is the quantification of

[4] For example, while Climent and Soriano (2011) find no significant differences in risk-adjusted returns between socially responsible investment (SRI) and conventional funds, Gil-Bazo et al. (2010) even find a superior performance of SRI funds, and Benson et al. (2006) reveal that SRI funds underperform their conventional peers.
[5] From a legal perspective, this understanding of fiduciary duty is supported by Freshfields Bruckhaus Deringer (2005), which is widely referred to as the "Freshfield Report".

corporate ownership's sustainability preferences. Chapter 4 presents a methodology for deriving these preferences from respective owners' investment behavior and shows that these quantified preferences actually drive CSR.

In analogy to the aforementioned fiduciary duty of asset managers, the objective function of corporate management is to maximize shareholder value. Accordingly, the promotion of (costly) sustainability projects could also lead to a conflict of interest at the corporate level - and thus possibly be avoided. Chapter 5 addresses this possible conflict and demonstrates that promoting sustainability activities at the corporate level can even create value, given shareholders appreciate such activities based on a corresponding preference.

The final Chapter 6 summarizes the results and gives an overview of implications that build on the insights of this dissertation. The remaining Chapter 1 concludes with a brief description of the research articles contained in this cumulative thesis.

1.2 Overview of included articles

Article title	Co-authors	Published?	Journal	Date
Investors' carbon risk exposure and their potential for shareholder engagement	Lukas Benz Julia Scherer Janik Syryca Stefan Trueck	Yes	Business Strategy and the Environment (B), forthcoming[6]	2020
Herds on green meadows – the decarbonization of institutional portfolios	Andrea Jakob Lukas Benz Marco Wilkens	Yes	Journal of Asset Management (B), Vol.21, pp. 13-31[7]	2020
Ownership comes with responsibility – the impact of ownership characteristics on CSR	Lukas Benz Martin Rohleder Marco Wilkens	No	WP, University of Augsburg[8]	2020
The impact of corporate social responsibility on firm value: the role of shareholder preferences	–	No	WP, University of Augsburg	2020

[6] doi: 10.1002/bse.2621.
[7] doi: 10.1057/s41260-019-00147-z.
[8] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3606143.

1.2.1 Article I: Investors' carbon risk exposure and their potential for shareholder engagement

Considering the dual function of an investor as portfolio manager and partial owner, the first article of this dissertation illuminates both perspectives in the context of carbon risk. By analyzing a global sample of 12,698 investors of six investor types with a combined total of 3,135 distinct equity holdings over the period from 2000 to 2015, we find that government agencies with an average portfolio exposure of 49% are most affected by carbon risk among all investor types. Moreover, by examining the ownership structure of carbon-intensive holding firms, we show that here too, government agencies on average hold the majority of shares. We substantiate our findings regarding the carbon preference of each investor type by controlling for additional firm characteristics as well as country and year fixed effects.

With regard to the Paris Agreement and the corresponding expected legislative interventions to reduce carbon emissions, we conclude that governments are not only the initiators of upcoming regulations, but also significant affected parties. At the same time, however, due to their dominant role in the ownership structure, governments also have a high potential to influence their firms' carbon intensity more directly in terms of shareholder engagement.

1.2.2 Article II: Herds on green meadows – the decarbonization of institutional portfolios

In addition to the possibility for investors to reduce their carbon risk through targeted engagements with portfolio firms, this can also be achieved by re-allocating capital in the sense of portfolio decarbonization.

The second article deals with the emergence of portfolio decarbonization in the financial market and shows that a corresponding herding behavior among institutional investors can be observed. Our herding analysis is based on the quarterly trading behavior of 137,976 investors between 2002 and 2017, adopting the methodologies of Sias (2004) as well as Popescu and Xu (2018).

We define decarbonization herding as investors following their own or others' buy trades in green stocks and their own or others' sell trades in brown stocks, respectively.

The results disclose that about 96% of overall herding is attributable to decarbonization trades, while the opposite behavior, i.e. carbonization trades, accounts for only 4%. Furthermore, we show that this specific herding behavior is mainly driven by follow-herding, i.e. investors follow others in portfolio decarbonization. Finally, in analyzing which type of investor leads this decarbonization movement, we find that primarily investment advisors and hedge funds are triggering subsequent trades in the context of decarbonization.

1.2.3 Article III: Ownership comes with responsibility – the impact of ownership characteristics on CSR

The third article of this dissertation bridges the gap between investors' sustainability preferences and corporate social responsibility. A focus of this article is the development of an innovative methodological approach for determining the characteristics of corporate investors as well as their firm-level aggregate, referred to as ownership characteristics. Quantifying the characteristics of ownership enables us to assess corporate owners' preferences for CSR. Our methodology takes up several points of criticism of comparable studies (e.g., Dyck et al., 2019) where these preferences were not quantified but merely assumed in a generalized way.

The main finding of this article is that firms whose owners show predominantly stronger portfolio-based ESG preferences are significantly increasing their efforts to improve CSR. This result suggests that investors' commitment to sustainability is not limited to the portfolio level, but also includes an active role as corporate owner. We further show that greater heterogeneity among corporate owners' ESG preferences leads to lower CSR performance, which can be caused by the difficulty of corporate decision making when faced with the need to heed conflicting interests of owners (Goranova and Ryan, 2014). In addition, we empirically confirm

prominent theoretical concepts regarding the positive influence of long-term (Bãnabou and Tirole, 2010) and universal ownership (Hawley and Williams, 2007) on CSR. To counter the potential criticism that our results are not driven by the influence of owners, but merely a consequence of portfolio ESG-screenings, we substantiate and confirm our findings by conducting (Granger) causality tests.

One conclusion that the reader can draw from this analysis is that shareholders can significantly influence corporate decisions regarding CSR and thus, to a certain extent, bear a social responsibility themselves.

1.2.4 Article IV: The impact of corporate social responsibility on firm value – the role of shareholder preferences

Ultimately, it is up to corporate management whether it encourages CSR activities and thus contributes to the transformation towards a sustainable economy. Based on plausible economic arguments, corporate decisions should primarily contribute to maximizing shareholder value (Friedman, 1970). Whether and under which conditions the shareholder value orientation can be reconciled with CSR activities is the objective of the last article.

Thereby, I adopt the methodology developed in Article III to determine CSR preferences of 29,236 shareholders with respect to 6,845 firms between 2002 and 2017. Based on this, I conduct panel regressions using firm value as a function of CSR and an interaction term between CSR performance and the CSR preference of corresponding shareholders. My results reveal a significant value-enhancing effect of a higher shareholder CSR preference on the impact of a firm’s CSR performance. This suggests that promoting CSR is consistent with the corporate objective of maximizing value, providing this is in line with shareholders' sustainability preferences.

As a stimulus for future research, this article demonstrates that the consideration of quantifiable owner preferences is a decisive influencing factor in the context of investigating the effects of corporate decisions on firm value.

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2 Article I: Investors' carbon risk exposure and their potential for shareholder engagement

Lukas Benz, Stefan Paulus, Julia Scherer, Janik Syryca, and Stefan Trueck: Investors' carbon risk exposure and their potential for shareholder engagement. Business Strategy the Environment (2020): 1-20 (https://doi.org/10.1002/bse.2621).

VHB-Jourqual 3: B

3 Article II: Herds on green meadows – the decarbonization of institutional portfolios

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VHB-Jourqual 3: B

4 Article III: Ownership comes with responsibility – the impact of ownership characteristics on CSR

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Abstract. This article provides a novel methodology to investigate the influence of share ownership on corporate decision-making. Quantifying the characteristics of firms' owners based on their measurable investment habits enables us to assess their predominant preferences. We demonstrate that a preference by owners for eco-social investments is a positive force in their firms' CSR performance. In contrast, firms exhibit a lower CSR performance when owners show a higher degree of heterogeneity in terms of eco-social preferences. Furthermore, we find that universal as well as long-term ownerships significantly encourage CSR, hence confirming prominent theoretical concepts.

JEL Classification: G11, G15, G23, G30, M14

Keywords: Ownership, Institutional Investor, Shareholder Engagement, ESG, Corporate Social Responsibility

4.1 Introduction

The question of whether and how the interests of a firm's owners influence corporate decision making has been a focus of the literature on financial economics and management for quite some time. Studies on the subject usually approximate owner preferences by simply imputing pre-defined characteristics to specific investor types[9] whose aggregate ownership share in the firm is known (e.g., Oswald and Jahera, 1991, David et al., 1998, Piotroski and Roulstone, 2004, among others). However, this approach omits heterogeneous preferences within owner types and neglects the preferences of owners assigned to other types.

In this article, we propose an innovative two-step approach to measuring the preferences of corporate ownership that renders any previous attribution or categorization of owners obsolete. In the first step, each owner's characteristics are measured based on their equity portfolio holdings. In the second step, by constructing a "portfolio of owners" for each firm, we are able to measure the corporate ownership's dominating preferences as the share-weighted average of the owners' characteristics.[10] While this methodological refinement is generally applicable to ownership preferences regarding any quantifiable firm characteristic, this article concentrates on a question that is the current focus of public and scientific interest and at the same time of high societal relevance – namely, do owners have an influence on corporate social responsibility (CSR)?

In their role as transformers of lot size, maturity, and risk, participants in the financial market have an influence on economic growth and thus, to a considerable extent, on our society. Their expectations and attitudes have societal effects ranging from the way investee firms operate at the micro-level to macroeconomic trends (Levine, 2008). As a consequence, society expects

[9] Like, e.g., hedge funds as aggressive and short-term or pension funds as conservative and long-term.
[10] In this article, the terms "investor" and "owner" are used as synonyms and denote a single equity investor of a firm. The term "ownership" describes the aggregate of all corporate owners, i.e. the firm's "portfolio of owners".

appropriate business behavior (Wood, 1991). Financial markets therefore have a social responsibility, underlined not least by the Paris Agreement, which considers the allocation of financial flows in line with low-carbon and climate-resistant development as one of its central aims (UNFCCC, 2015).

Given the sharp increase in socially responsible investments worldwide[11], it appears that a growing number of generally institutional but also individual investors are willing to shoulder this responsibility by integrating sustainability criteria into their investment decision-making. In addition to traditionally norm-constrained investors such as pension funds and religious organizations (Hong and Kacperczyk, 2009), examples include voluntary initiatives such as the Portfolio Decarbonization Coalition (PDC) or Principles of Responsible Investment (PRI), as well as investors with appropriate investment objectives (e.g., SRI funds). The integrated sustainability criteria go far beyond climate change and cover a broad spectrum of environmental, social and governance (ESG) aspects (van Duuren et al., 2016). In parallel to their functions as capital allocators, investors are also partial owners of the actual primary source of economic and eco-social prosperity, i.e. the corporations. Not a new insight, but one that became apparent recently in Larry Fink's highly regarded letter to CEOs, in which the world's largest asset manager undertakes to fulfill his (fiduciary) social responsibility as an investor and as active owner (BlackRock, 2020).

With our central research question, we establish a link between these two roles and investigate whether the eco-social preferences of a firm's investors, reflected in the ESG scores of their portfolios, also influence that firm's CSR performance. Our methodological refinement allows us to test the corresponding hypotheses empirically, explicitly taking into account the heterogeneity of owners' preferences, which is suspected of hampering management's

[11] According to the Global Sustainable Investment Alliance, sustainable investments increased by 66% between 2014 and 2018 (GSIA, 2018).

decision-making in the need to heed the owners' possibly opposing interests (Goranova and Ryan, 2014). Moreover, based on theoretical deductions including the concepts of universal (Hawley and Williams, 2007) and long-term investors (Bãnabou and Tirole, 2010), we identify and test additional owner characteristics that might suggest a preference for or a link to CSR.

To be able to identify the owners' characteristics in the first step and then aggregate owners' preferences at corporate level in the second step, we compile an extensive global ownership and stock dataset that includes 28,201 firms, which on average cover 93% of the annual worldwide market capitalization during the period from 2002 to 2017. For these firms, we achieve an ownership coverage of 65% on an annual average. To the best of our knowledge, this sample is unsurpassed in global coverage of ownership information, aggregated market capitalization, number of observed firms and length of observation period.

Our methodological development builds on a broad base of quantified owner characteristics and demonstrates that there is considerable heterogeneity within the investor types previously treated as homogeneous. The empirical results show that firms whose investors show predominantly stronger portfolio-based ESG preferences are significantly increasing their efforts to improve CSR. This is especially the case with regard to environmental and corporate governance issues, and less for social concerns. These findings indicate that investors' commitment to sustainability is not limited to the portfolio level, but also includes an engagement as corporate owners. In contrast, firms exhibit a lower CSR performance with owners who show a higher degree of heterogeneity in terms of eco-social preferences. This suggests that conflicting voices reduce management's decision-making ability through the need to reconcile disparate corporate owners' desires as well as reduce the possibility of collaboration among active shareholders. Further, consistent with the theoretical assumption that so-called universal owners promote CSR activities in their own interest, we find a positive

relationship between CSR performance and the average number of firms held by corporate owners. Likewise, we find that the CSR efforts of a firm critically depend on its owners' investment horizon and thus support the hypothesis that long-term ownership encourages CSR activities.

We avoid endogeneity concerns by adjusting the ownership characteristics used in our main analysis as explanatory variables for the variation in firm characteristics (CSR). Since owner characteristics themselves were determined based on firm characteristics, we thus eliminate the individual contribution of the respective firm to the calculated owner characteristics. The firm-level aggregate of corporate owners' characteristics, referred to as "ownership characteristics", does not therefore depend on the respective firm itself. Furthermore, we address concerns regarding the reverse causality of our results. By conducting (Granger) causality tests, we provide evidence that our coefficient estimates are not driven by positive or negative screening based on ESG criteria in the owners' investment decision processes. Several other tests, including the use of ESG data from an alternative data provider, the different consideration of time-invariant effects, as well as other control variables, confirm the robustness of our analyses.

This article contributes generally to the ongoing debate on the separation of ownership and control in publicly listed corporations (e.g., Vernon, 1970, Claessens et al., 2000, among others). In doing so, we empirically show that shareholders influence corporate decisions, which is evidence against their having a purely passive role as characterized by Berle and Means (1932). Second, our innovative methodological approach precludes the criticism regarding the blanket attribution of investors based on a predefined typology and the associated neglect of conflicting preferences in their functions as active owners (e.g., Bagwell, 1991, Hoskisson et al., 2002). While this article focuses exclusively on CSR, the methodology developed here can be universally adapted to any quantifiable firm characteristic, opening a

wide field for further research. Third, our tests regarding investors' CSR engagement address the issue of whether shareholders have an influence on the environmental, social and governance policies of their firms. We also confirm the literature that has already answered this question in the affirmative. Our study is neither a substitute for, nor a contradiction of, these studies, but rather a completion that does not restrict itself to a specific group of owners (like, e.g., Dyck et al., 2019 and Chen et al., 2020) or a single channel through which owners can exercise influence (like, e.g., Dimson et al., 2015). And fourth, for the first time to the best of our knowledge, we empirically test and confirm prominent theoretical concepts concerning the positive influence of long-term (Bãnabou and Tirole, 2010) and universal ownership (Hawley and Williams, 2007) on CSR.

The remainder of the paper is structured as follows. Section 4.2 places our contribution in the context of existing approaches to investigating shareholders' influence on corporate decision-making and concludes by developing hypotheses on how ownership characteristics influence CSR. In Section 4.3, we introduce the data and present summary statistics of our sample. Section 4.4 contains a detailed explanation of the methodological approach. Section 4.5 presents the results on whether ownership preferences are linked to CSR performance, verifies them for (Granger) causality, and gives an overview of conducted robustness tests. Section 4.6 concludes.

4.2 Theoretical background and hypothesis development

4.2.1 Integration into existing research and contributions

In their renowned book "The Modern Corporation and Private Property" published in 1932, Adolf Berle and Gardiner Means postulated that the separation of ownership and control has become a common characteristic of large US public companies. In their appraisal, shareholders

have a more or less inactive role within the company and have only a very limited effect on corporate decision-making. As a result of this assessment, the question of how (and whether) the interests of corporate owners can be represented and fulfilled by the management has been increasingly discussed and empirically examined.

Beginning with and based on agency theory (Jensen and Meckling, 1976), corporate governance mechanisms, such as performance-oriented compensation or controlling by outside directors, were established to subtly balance the interests of shareholders and corporate management. The relevance of these mechanisms for shareholder value is confirmed by several studies (e.g., Cremers and Nair, 2005, Bebchuk et al., 2009, among others).

In addition to the need of management to take owners' interest into account contingent on contractual or organizational arrangements, Hirschman (1970) formulated fundamental and direct response options that owners may exercise in the absence of satisfactory corporate (management) performance, namely "exit" and "voice".[12] "Exit" simply describes the shareholders' option to express their dissatisfaction by selling shares. To verify the effectiveness of this strategy, Parrino et al. (2003) find empirical support for the hypothesis that changes in shareholder composition influence the board's decisions. Of course, the exited owners do not benefit from this response, but Admati and Pfleiderer (2009) see the mere threat of an exit as a disciplinary tool to impact managerial behavior − the hazard of divestment thus represents a hybrid between "exit" and the second response option "voice". Apart from this rather indirect and informal approach, exercising their rights as partial owners is a traditional way for shareholders to "voice" displeasure with management. In this context, several empirical

[12] Hirschmann (1970) also mentioned a third option "loyalty", which will not be discussed in this article.

studies examine the response to and success of shareholder proposals (Gordon and Pound, 1993, Karpoff et al., 1996, and Gillan and Starks, 2000, among others).

McCahery et al. (2016) argue that many interventions by shareholders also take place behind the scenes. These personal interactions with corporate representatives are therefore generally not applicable to empirical research. An exception is a work by Carleton et al. (1998), which relies on a private database of the correspondence between TIAA-CREF[13] and investee firms. It shows that a high proportion of agreements on corporate governance issues are reached without shareholders voting and that the targeted firms also initiate actions to fulfill these agreements.

Without limiting themselves to concrete channels and to overcome the problem of hidden shareholder activism, many scholars focus on specifically characterized owner groups and use their aggregated ownership share in the respective firm as a "potential for influence". The underlying idea is obvious: the higher the share of a certain group of owners, the more likely it is that corporate decisions will be guided by their interests or characteristics. For example, Cornett et al. (2007) argue that institutional investors, as owners with stronger monitoring capabilities, pressure firms to act in the best interest of shareholders and confirm a positive relationship between institutional ownership and firms' operating cash flow returns. A disadvantage of this approach is the assumption that the owners of a group have the same interests and act with a unified voice. Hoskisson et al. (2002) show that there are heterogeneous preferences within the group of institutional investors depending on the type of investor, and argue that these potentially conflicting voices should be taken into account.

[13] Teachers Insurance and Annuity Association – College Retirement Equities Fund

One attempt to reduce this intra-group heterogeneity is to define more granular owner groups. For example, Borisova et al. (2015) find support for the hypothesis that high government ownership is generally associated with a higher cost of debt, consistent with state-induced investment distortions. Boubakri et al. (2013) interpret foreign investors as owners who are more likely to undertake capital budgeting decisions and find a positive relationship between foreign ownership share and earnings volatility of newly privatized firms. Dyck et al. (2019) characterize pension funds as long-term investors and hedge funds as short-term investors and show that pension funds, in contrast to hedge funds, promote the environmental performance of firms. However, this approach can also be criticized with the same argument, namely that it cannot be assumed that owners even within a more granular group are homogeneous and have identical preferences, (e.g., Çelik and Isaksson, 2014) or that other owners of the same firm who do not belong to the group under consideration can be neglected. The interests of these omitted owners could indeed conflict with those of the examined owner group. Since the corporate executives are obliged to consider the preferences of all owners according to their voting rights, this requires a methodical approach that respects the individual preferences of all owners, taking into account their respective ownership shares.

Our contribution addresses these points of criticism and represents a methodological improvement for investigating the relationship between ownership and corporate policy. First, unlike previous approaches, we do not distinguish between pre-aggregated owner groups but refer to the level of single investors or investment companies. Second, we include all identifiable owners of a company and thus also take into account their potentially competing preferences. Third, we use only measurable owner characteristics that reflect their preferences and are therefore independent of assumptions about the preferences of different owners, owner groups, or types. This represents a significant improvement over previous approaches and is generally applicable to ownership preferences regarding any quantifiable firm characteristic.

Besides this methodological refinement, we also contribute to an emerging research focus examining the impact of shareholders on CSR. Following the Friedman doctrine, companies fulfill the exclusive purpose of maximizing shareholder value (Friedman, 1970). On that note, shareholders' values are described as purely monetary and their role as rational utility maximizers. Accordingly, Gillan and Starks (1998) see the inherent motivation of active shareholders as the reduction of agency conflicts and the associated costs that counteract the growth of their values. Non-financial motives for owners to become engaged, especially with regard to the company's social and environmental impact, do not at a first glance fit into this framework.

To still be compatible with the classic shareholder primacy view, many scholars seek to establish a link between CSR and firms' financial performance. In a survey of more than 2,200 individual studies from 1978 to 2015, Friede et al. (2015) conclude that the large majority report a positive relation between ESG criteria and corporate financial performance. This argues in favor of theories summarized by Bãnabou and Tirole (2010) under the banner of "doing well by doing good".

A second approach to explaining CSR engagements is to rethink the definition of "shareholder value". Among others, Hart and Zingales (2017) argue that owners consider social and ethical factors as well as externalities generated by the corporation's profit-making activities. Thus, rather than maximizing shareholder wealth in the sense of market value, the appropriate objective should be shareholder welfare, which is defined as the combination of shareholder wealth and negative externalities. Even if CSR investments are expected to lower financial returns, investors may value a firm's social expenditures (Baron, 2008) – a prosocial investor attitude that Bãnabou and Tirole (2010) subsume as "delegated philanthropy".

4.2.2 Testable hypotheses

Regardless of whether their original motives are financial or philanthropic (or both), a growing number of investors advocate including CSR criteria in their investment decisions and engagement priorities. For example, the Portfolio Decarbonization Coalition (PDC), whose signatories manage assets of over US$ 3,200 billion, is pushing for a reduction in greenhouse gases. In addition to shifting their portfolios towards more climate-friendly investments, they are also seeking to achieve this goal through targeted engagements (PDC, 2015). Another organizational platform provided by the United Nations, the Principles of Responsible Investment (PRI) initiative, supports institutional investors in making their investment decisions in line with CSR criteria and in functioning as active owners (PRI, 2019).

In addition to these voluntary associations of institutional investors, norm-constrained owner groups such as pension funds, university endowments, and religious organizations are also associated with higher eco-social or ethical investment behavior (Hong and Kacperczyk, 2009). The decisive question here is whether this seemingly eco-social awareness of investors is actually leading to changes at the source of externalities − in the corporations.

Our first hypothesis is related to the investigation of Dyck et al. (2019), which first addresses this question and shows that institutional ownership share is positively related to future CSR performance. It further demonstrates that this effect intensifies when using exclusively the ownership shares of PRI signatories – a labeled owner group for which a higher eco-social awareness sounds plausible. Taking into account the above-mentioned points of criticism regarding the assumption of homogeneous institutional preferences, we refer to the individual eco-social preferences of the entire range of corporate owners and hypothesize:

H1a: The higher the level of the ownership's ESG preference is, the higher the CSR performance.

H1b: An increase in the ownership's ESG preference causes positive changes in future CSR performance.

On the surface, these predictions sound trivial, but their empirical confirmations would represent the first evidence of corporate management response to the eco-social demands of their principals.

The second hypothesis addresses the influence of owners' heterogeneity directly. Dimson et al. (2015) show that collaborations among shareholders contribute positively to the success of CSR engagements. A basic prerequisite for entering into such alliances is that the shareholders' preferences regarding the purpose of engagement are similar. On the other hand, heterogeneous or even conflicting shareholder interests lead to challenges for management and shareholder agreement on the appropriateness of an action (Goranova and Ryan, 2014). Therefore, we expect that:

H2a: The higher the level of ownership's heterogeneity regarding ESG preferences is, the lower the CSR performance.

H2b: An increase in the ownership's heterogeneity regarding ESG preferences causes negative changes in future CSR performance.

Following the "doing well by doing good" hypothesis, the literature mentions specific owner characteristics that are linked to the promotion of CSR activities. In this context, Monks and Minow (1995) coined the term "universal ownership" to describe (institutional) investors with a wide range of equity holdings. Due to their slice of the broad economy, they are particularly affected by corporate externalities. The logical deduction is that it is in the universal owners' self-interest to reduce negative and encourage positive externalities by influencing holding firms' businesses. However, this derivation has never been empirically verified. With our third

hypothesis we refer to the fundamental characteristic that defines the "universality" of an owner, i.e. the number of portfolio firms held. In this way, we avoid an exclusive consideration of specific investors or types of investors (for example, pension funds are often referred to as universal owners), but also include the entire ownership of a company. Based on these theoretical assumptions, we argue that:

H3a: The higher the ownership's universality is, the higher the CSR performance.

H3b: An increase in the ownership's universality causes positive changes in future CSR performance.

A second characteristic that Hawley and Williams (2000) also attribute to universal owners is the long-term nature of their relationships with holding firms. Bãnabou and Tirole (2010) argue that investments in CSR activities are not immediately reflected in an increase in shareholder value, but are first and foremost costs. Accordingly, it can be expected that short-sighted investors will be less interested in promoting CSR activities and more interested in reducing them in order to maximize short-term profits. In contrast, it can be concluded that long-term owners aim to promote CSR activities that contribute to a sustainable and intertemporal maximization of profits. In contrast to Nguyen et al. (2020), who find that long-term investors increase the shareholder value of CSR activities, we investigate the direct connection between ownership investment horizon and CSR activities and assume that:

H4a: The longer the ownership's investment horizon is, the higher the CSR performance.

H4b: An increase in the ownership's investment horizon causes positive changes in future CSR performance.

4.3 Data and summary statistics

4.3.1 Data sources and sample construction

Our global dataset consists of three major databases: ownership information, firms' financial characteristics, and firms' ESG information. We obtain data regarding ownership information from the Refinitiv Ownership and Profiles (ROP) database[14]. Refinitiv's ownership data covers the majority of publicly listed firms worldwide. Primary sources of this database include SEC filings, international declarable stakes notifications, mutual fund and ETF portfolios, share registers, and directors' and insiders' disclosures. The database provides information about the number of shares held and the respective market value of the owners' positions in the individual firms. The data also enables us to identify the investor type of the individual owners (e.g., hedge funds). We calculate each investor's ownership share based on their number of shares held in relation to the respective firm's common shares outstanding for each year-end. In addition to the ownership information, we use the reported value of the positions held by each investor to calculate holding weights and thereby create a panel of the owners' global stock portfolios. It should be noted that the portfolios considered here do not reflect the single fund levels (e.g., iShares Core MSCI World) but the investment company levels (BlackRock Inc.).[15]

Stock returns, common shares outstanding and market capitalizations are obtained from Refinitiv Datastream[16] (RDS). To ensure that observed stocks are not exclusively owned by individual major investors, firms have to pass a minimum free-float requirement of at least 10% of the total market capitalization. We include firms that have been delisted or newly listed during the observation period to avoid survivorship bias. As already shown by Ince and Porter

[14] Formerly known as Thomson Reuters Global Equity Ownership database.
[15] Most (proxy) voting-rights policies incl. CSR strategy apply at company level and do not differ from fund to fund within an investment company. In the context of this investigation, the investment company level is therefore chosen as plausible owner level.
[16] Formerly known as Thomson Reuters Datastream.

(2006) the integrity of the RDS returns is not beyond doubt, which is why we adapt their proposed screens to daily returns.[17]

To determine the firms' CSR performance, we employ information from the ASSET4 ESG database provided by Thomson Reuters. ASSET4 analysts collect firm-specific data on ESG dimensions from a variety of public sources to quantify the quality of a firm's ESG policies. The data contains 70 environmental, 78 social, and 71 governance indicators. These indicators are answers to YES/NO questions, double YES/NO questions and numerical questions with a positive or negative direction that reflect a firm's commitment to CSR-relevant issues (e.g., "Does the company monitor the diversity and equal opportunities in its workforce?" as a YES/NO question with a positive direction within the "social" subcategory). When assessing the answers, we follow Dyck et al. (2019) and evaluate, for example, a "YES" to a question with a positive direction with a value of "1" and with "0" for "NO".[18] The sum of the evaluated indicator values (*I*) divided by the total number of indicators gives the "raw" ESG score or, by referring to the indicators of the respective subcategory, the raw E, S and G scores:

$$Firm\ score_{it} = \frac{1}{N}\sum_{n=1}^{N} I_{nit} \times 100 \qquad (1)$$

In Equation (1), $Firm\ score_{it}$ represents the corresponding raw E, S, G or ESG score of a firm i in year t, N is the number of indicators and I_{nit} denotes the value of indicator n. The scores are calculated on an annual basis, which allows us to track changes in firms' ESG activities over time. In contrast to the "ranked-based" scores directly provided by ASSET4 ESG, these scores are not relative to other firms' scores evaluated in the year under review. Firm-specific changes in CSR performance can thus be observed independently of changes in other firms'

[17] Ince and Porter (2006) originally developed screens for monthly returns. The adaptation to daily returns has the advantage that remaining outliers or approximations caused by these screens are less significant when converting to annual returns.
[18] For details on the ESG-specific indicators and their translation into indicator values, see Appendix A.

scores.[19] Since this data is available from 2002, it also defines the beginning of our investigation period.

4.3.2 Summary statistics

Table 1 gives an impression of the extensive coverage of our sample in terms of market capitalization and ownership information. The aggregated market capitalization of the sample firms (RDS database) covers an annual average of 93.49% of the aggregated global common equity of all listed firms (according to The World Bank, 2018). On average, we observe 150,554 owners holding around 64% of the sample market capitalization each year-end (ROP database). Accordingly, the remaining ownership shares are not covered by Refinitiv's primary sources and can therefore predominantly be described as small or micro investors, which are neglected in this investigation[20]. We observe an increase in the coverage of ownership information over time, which can be explained by the growing market share of institutional investors (see OECD, 2017). To the best of our knowledge, we use a sample that is unsurpassed in terms of both aggregated market capitalization and the amount of ownership information covered.

[Insert Table 1 here.]

The geographical distribution of the sample firms includes 50 countries with economies at all stages of development, and without exclusion of any industry. Table 2 provides basic summary statistics for the full sample consisting of 28,201 firms on an annual basis between 2002 and 2017. This large number of firms is needed to ensure the most complete possible replication of the owners' global stock portfolios. Market value and return statistics refer to the full sample

[19] This avoids, for example, accusing a firm of slackening its CSR efforts when in fact these have remained constant and only the scores of other firms have improved.

[20] Refinitiv's ownership database sources most of its information from reports of declarable shareholdings (e.g. 13d and 13f filings). Since the reporting obligation is in most cases only triggered at volume-related thresholds, the database mainly reflects large investors or investors with large ownership shares.

of 338,897 firm-years, respectively, whereas the ESG score and its subscores refer to 51,966 firm-years or 7,089 firms for which ASSET4 ESG information is available.

Panel A shows a mean (median) market capitalization of $2.352 ($352) million and a mean (median) stock return of 9.58% (3.40%) p.a. for the full sample. For the subsample of firm-years for which ESG information is available, the mean ESG score is 37.33. The means of the subscores are 20.28 for environmental, 41.34 for social and 49.75 for governance, respectively, with a perfect score being 100.

[Insert Table 2 here.]

We provide more detail on the covered ownership level and ESG scores across countries in Panel B and industries in Panel C. With about 25%, the majority of our sample firms are located in the US, and with an average of 73.93%, US firms also achieve one of the highest levels of coverage with regard to ownership data. The least amount of ownership information shown is for Pakistan with an average of 13.90%. Panel C shows the average ownership coverage per industry, ranging from 55.30% to 61.22% for the full sample and from 63.08% to 73.62% for ASSET4 ESG firms. In total, the average ownership coverage of all firm-years is lower than for ASSET4 ESG firm-years (58.78% compared to 68.34%).

4.4 Measuring the characteristics of corporate ownership

4.4.1 Owner characteristics

The first step in determining the ownership characteristics of a firm is to evaluate the characteristics of every single owner. To obtain a measurable assessment of the objectives pursued by the individual owners, we refer to their portfolio compositions and the resulting portfolio characteristics. In doing so, we assume that the characteristics of an investor are

expressed by the characteristics and weighting of their individual holdings within the portfolio, and that these at the same time reflect the characteristics or preferences of their role as owner. This has the advantage that we do not depend on labels or generalized assumptions regarding the characteristics of various investor or owner groups but can make an objective measurement at investor level.

To quantify owner attitudes towards aspects of ESG, we calculate the sustainability scores of a portfolio following Gibson and Krueger (2018). For each year, the total ESG score and its subscores are aggregated at portfolio level by computing the value-weighted average of the ESG scores of the holdings as:

$$Investor\ score_{jt} = \sum_{i=1}^{N^{jt}} weight_{jit}\ \ Firm\ score_{it} \tag{2}$$

where $weight_{jit}$ is the holding weight of firm i in owner portfolio j at each year-end t and $Investor\ score_{jt}$ describes either the raw E, S, G or ESG score of the corresponding investor.

To determine each investor's investment horizon, we follow Gaspar et al. (2005) and use the turnover ratio derived from portfolio holdings to build an approximation of the commitment period of an owner:

$$Investor\ turnover_{jt} = \frac{\min\left(|buy\ val_{jt}|, |sell\ val_{jt}|\right)}{0.5(TNA_{jt} + TNA_{jt-1})} \tag{3}$$

In Equation (3), $buy\ val_{jt}$ is the value of buy trades and $sell\ val_{jt}$ is the value of sell trades since the end of the previous year, and TNA_{jt} is the held value of all equity holdings of the owner portfolio in the corresponding year. The higher the turnover ratio, the more frequently the owner trades portfolio positions, and the shorter the investment horizon and vice versa. As this definition reflects the turnover of a portfolio on a year-end basis, we necessarily neglect interim trading, which renders this figure a lower bound of the actual turnover.

Universal owners are characterized by the fact that they represent a high share of the entire market in their portfolios (e.g., Hawley and Williams, 2007). To measure an owner's "universality", we count the number of firms in which an owner has invested at each year-end and thus follow the logic that the higher the number, the more universal the owner.

Analogous to the calculation of the owners' ESG scores in equation (2), we also use the value-weighted average of holding returns as a measure of owner portfolio returns.

$$Investor\ return_{jt} = \sum_{i=1}^{N^{jt}} weight_{jit-1} \ \ ret_{it} \tag{4}$$

Unlike Equation (2), we use the holding weight at the beginning of each year ($weight_{jit-1}$) to avoid falsifications due to return-induced weight changes. These portfolio returns are calculated on a buy-and-hold assumption and trades during the year are therefore neglected. Only long equity positions are considered, as short, fixed-income, derivatives or cash positions are not available in the data. Also, expenses such as transaction costs or fees are not taken into account, which is why these returns are interpreted as hypothetical buy-and-hold portfolio raw returns.

Table 3 shows the means and standard deviations of portfolio characteristics for each investor type. By comparing the means of portfolio ESG scores across investor types, it comes as no surprise that pension funds are the leaders among all owner types, with an average ESG score of 44.55. This is in line with expectations since pension funds are often bound to social norms, which include awareness for ESG aspects (Hong and Kacperczyk, 2009). Hedge funds have the highest turnover (15.25%), which confirms the short-term orientation of this type of investor (Cella et al., 2013). In contrast, individual investors have the lowest turnover ratio of 0.69% and can, therefore, be described as buy-and-hold investors. Since individual investors make up the majority of observations, they also have a significant influence on the equal-weighted overall means. For example, all investors combined show an average turnover ratio of only

3.03%. As noted above, the portfolios considered here reflect the investment company level at year-end. Both the high level of aggregation and the neglected intra-year trades have a negative effect on turnover ratios, as opposing trades of the individual funds of an investment company are netted out.

[Insert Table 3 here.]

A general attribution of certain characteristics based on investor types seems to be justified when only the means are considered, but for the standard deviations it becomes clear that there is considerable heterogeneity within the different types of investors. This heterogeneity among investors, regardless of the investor type, requires methodological development that can establish a relationship between the increasingly diverse and dynamic ownership structures and the CSR activities they encourage.

4.4.2 Endogeneity adjustments

The owner characteristics of a firm described in the previous section are used in our main analysis as explanatory variables for firm characteristics (ESG scores). Since the owner characteristics themselves were determined based on firm characteristics, we might be confronted with endogeneity. To ensure that only the effects of the owners on firm characteristics are considered, we eliminate the individual contribution of the respective firm to the calculated owner characteristics as:

$$Investor\ score\ adj_{jst} = Investor\ score_{jt} - \frac{weight_{jst}\ \ ((\sum_{i=1}^{N^j} weight_{jit}\ \ \ Firm\ score_{it}) - Firm\ score_{st}))}{weight_{jst} - 1} \quad (5)$$

where $Investor\ score\ adj_{jst}$ is the raw E, S, G or ESG score of owner portfolio j for each specific firm s based on all other firms i in the respective owner portfolio in year t. Consistently, the same adjustment for the owner portfolio return is executed using the weights of the previous

year $weight_{jst-1}$. Following the same principle, we adjust investor turnover by neglecting the buy and sell values as well as the value held ($value_{jst}$) by the respective firm s:

$$Investor\ turnover\ adj_{jst} = \frac{\min(|(buy\ value_{jt} - buy\ value_{jst})|, |(sell\ value_{jt} - sell\ value_{jst})|)}{0.5((TNA_{jt} - value_{jst}) + (TNA_{jt-1} - value_{jst-1}))} \quad (6)$$

Lastly, the number of portfolio holdings, as a measure of an owner's universality, is simply adjusted by subtracting 1. The owners' characteristics adjusted in this way are individual for each firm-year. Therefore, the firm-level aggregate of corporate owners' characteristics − referred to as ownership characteristics and described in the following section − is not influenced by the respective firm itself.[21]

4.4.3 Ownership characteristics

So far, the evaluation of the owners' portfolio characteristics based on portfolio holdings has been the focus of attention. The second methodical step takes the perspective of an individual firm or its executives and provides a quantifiable answer to the overriding question in the context of corporate management: What is the owners' preference regarding certain aspects of corporate policy? To aggregate the heterogeneous or even opposed preferences of a large number of different partial owners to one figure, we consider the individual firm technically as a "portfolio of owners", which enables us to compute the ownership characteristic of a firm as follows:

[21] Since the firm-level aggregate of corporate owners' characteristics is carried out under consideration of owner preferences (portfolio weights) and ownership structure (ownership shares), the respective firm characteristic is not endogenously affected by other firms' average characteristics (e.g. peer pressure) which avoids a reflection problem according to Manski (1993).

$$Ownership\ characteristic_{st} = \sum_{j=1}^{N^s} perc\_held_{jst} \quad Investor\ characteristic\ adj_{jst} \tag{7}$$

The particular adjusted characteristics (ESG scores, number of holdings, turnover, and return) of the owner portfolios j are parameterized by $Investor\ characteristic\ adj_{jst}$. By using the ownership share of the respective owner ($perc\_held_{jst}$) as a weighting factor, we implicitly integrate the balance of power between the owners. At the same time, the amount of the ownership share determines the prospects of success of a forced change in future corporate policy orientation, for example within the context of a vote on a specially submitted shareholder proposal. Accordingly, the preferences of an owner with a high ownership share are given a correspondingly higher weighting and vice versa.

As seen in Panel C of Table 2, we achieve an average ownership coverage of 68.35% for ASSET4 ESG firms and therefore neglect the remaining free float held by investors who are not subject to regulatory reporting requirements (e.g., SEC filings). As the associated reporting thresholds are triggered when the portfolio value or the ownership share is sufficiently high, these investors are essentially small. Due to their minor ownership shares, these small investors would in any case have only petty effects on our measure. The definition of $perc\_held_{jst}$ therefore simplifies by assuming full ownership coverage and corresponds to the ratio between the shares held by an owner j and the total shares held by all owners that can be represented by our sample per firm and year.

Within the ownership structure of a firm, different shareholders might have different preferences for CSR policies. This heterogeneity harbors potential conflicts among shareholders and leads to challenges for corporate management to align CSR activities in the common interest of the entire ownership. Nevertheless, a homogeneous set of interests among shareholders promises not only to improve management's decision-making ability from the

owners' standpoint, but also to improve the possibility of collaboration among active shareholders. To quantify the heterogeneity of owners' eco-social preferences, we use the standard deviation of the owners' ESG scores within a firm:

$$Ownership\ heterogeneity_{st} = \sqrt{\frac{1}{N^s}\sum_{j=1}^{N^s}(Investor\ score\ adj_{jst} - \overline{Investor\ score\ adj_{Jst}})^2} \quad (8)$$

Table 4 shows the summary statistics of the calculated ownership characteristics for firm-years with available ASSET4 ESG information. The average firm's ownership possesses an ESG score of 34.78. Compared to the owners' portfolio ESG scores with a mean of 39.34 (Table 3), this indicates that owners holding larger ownership shares tend to have a less strong preference for ESG. The standard deviation of the owners' ESG preferences within firm-years, referred to as Ownership ESG score Heterogeneity, is on average 7.45, while the overall standard deviation of ESG preferences at the portfolio level shows a standard deviation of 9.96 (Table 3). This implies that owners have more similar ESG preferences within firms than across all owners. These relationships also apply to the respective subscores.

Compared to the average number of holdings at the portfolio level of around 35 (Table 3), the average number of holdings of the ownerships is relatively high at over 1,800. This is mainly due to the statistical effect of averaging on firm-year level, since owners with a high number of holdings also appear in a high number of firm-years. At 11.12%, the Ownership turnover is also higher than at the individual owner level (3.03%). In contrast, the return at the ownership level is lower than at the portfolio level (7.17% to 12.27%). This suggests that on average the dominate portion of a firm's owners have shorter investment horizons and generate lower returns than the average figures at the individual owner level.

[Insert Table 4 here.]

4.5 Corporate ownership characteristics and social responsibility

4.5.1 Is CSR related to the characteristics of ownership?

With our first analysis we investigate the contemporary relation between ownership characteristics and firms' CSR performance by conducting a panel regression at the firm-year level:

$$\begin{aligned} Firm\ score_{st} = \alpha + \beta_1 Ownership\ score_{st} + \beta_2 Ownership\ heterogeneity_{st} \\ + \beta_3 Ownership\ holdings_{st} + \beta_4 Ownership\ turnover_{st} \\ + \beta_5 Ownership\ return_{st} + \eta Controls_{st} + \lambda + \tau + \varepsilon_{st} \end{aligned} \quad (9)$$

The dependent variable, denoted by $Firm\ score_{st}$, is one of the environmental, social, governance, or the total ESG score of firm s in year t. The ownership's eco-social preference and its heterogeneity are denoted by $Ownership\ score_{st}$ and $Ownership\ heterogeneity_{st}$ according to the respective score of the dependent variable. $Ownership\ holdings_{st}$ is the ownership's universality defined as the natural logarithm of the owners' share-weighted number of holdings, and $Ownership\ turnover_{st}$ proxies the ownership investment horizon. As a control variable at ownership level, we include $Ownership\ return_{st}$ computed as the corporate owners' share-weighted equity portfolio return. Following Dyck et al. (2019) we use firm size as the natural logarithm of market capitalization, assets tangibility, yearly stock return, leverage, and Tobin's Q as firm-level control variables ($Controls_{st}$). As seen in Table 2, variation exists in firms' ESG scores across industries and countries. We conservatively control for these variations with firm (λ) and time-fixed effects (τ), and cluster standard errors at firm level.

Table 5 shows the corresponding regression estimates. The first three columns show coefficient estimates for the subcategories of ESG, column 4 for the total ESG score. The coefficients on Ownership E, S, G or ESG score indicate a positive relationship between ownership's eco-

social preferences and the level of the owned firm's CSR, each significant at the 1% level. This confirms the hypothesis H1a that the owners' eco-social awareness is positively related to CSR performance. As a consequence of the adjustments described in Section 4.3.2, these coefficients are not endogenously driven by the firm itself.[22] Rather, they are an indication that ownership with high eco-social awareness is not coincidentally linked to a firm with higher CSR performance but can be consistently attributed to the owners' general investment preference. Accordingly, the CSR efforts of a company are not detached from the preferences of its owners. Also, the coefficients of the owners' heterogeneity show consistent results. The negative signs meet expectations (H2a) that a firm that has a more disparate ownership structure in terms of eco-social preferences, on average shows significantly lower CSR performance.

Further, the results confirm the positive influence attributed in particular to universal and long-term owners (H3a and H4a). Except for the environmental subcategory, the coefficients for the share-weighted number of firms held by the owners (*Ownership holdings*) show a positive and significant relationship with CSR. Also, the ownership investment horizon, which we approximate by the owners' share-weighted portfolio turnover ratio (*Ownership turnover*), shows a significant relationship with CSR performance; the higher the owners' turnover is − or the shorter their investment horizon is − the lower the firms' CSR performance. The ownership return also shows a negative relationship with each of the firm's ESG categories, indicating that financially more successful ownership is associated with lower CSR performance. Due to the lack of a theoretical foundation regarding this relationship so far, we can only assume that financially more successful ownerships avoid the promotion of CSR and the associated costs.

[22] Without the adjustment described in Section 4.3.2, an extreme constellation would be possible, in which a single owner owns a single firm in full. In this case, the explanatory and dependent variable (e.g. Ownership ESG score and firm's ESG score) would be completely identical. This constellation and also milder variants of endogeneity are excluded by the adjustment.

[Insert Table 5 here.]

4.5.2 Do ownership characteristics drive firms' CSR performance?

So far, the results have shown a strong and significant relationship between ownership characteristics and the level of CSR. These findings, we argue, suggest that the CSR efforts of a firm are influenced by the corresponding preferences of its ownership. In this section, we further examine whether these ownership characteristics are drivers of CSR activities in line with the theoretical assumptions in Section 4.2.2. To test the derived hypotheses, we use a dynamic specification of the empirical model described in Equation (9) by adding the firm's current CSR level as a predictor for the CSR level in the following year:

$$\begin{aligned}\Delta Firm\ score_{st+1} = {} & \alpha + \beta_1 \Delta Ownership\_score_{st} + \beta_2 \Delta Ownership\_heterogeneity_{st} \\ & + \beta_3 \Delta Ownership\_holdings_{st} + \beta_4 \Delta Ownership\_turnover_{st} \\ & + \beta_5 \Delta Ownership\_return_{st} + \delta \Delta Firm\ score\ (IV)_{st} + \eta \Delta Controls_{st} + \tau \\ & + \varepsilon_{st}\end{aligned} \tag{10}$$

To deal with concerns about autocorrelation resulting from dynamic panel estimation, we follow Anderson and Hsiao (1982) and specify Equation (10) in terms of first differences (Δ) and use $\Delta Firm\ score_{st-1}$ as an instrument variable (*IV*) for $\Delta Firm\ score_{st}$. We control for firm-level characteristics ($\Delta Controls_{st}$) as described in Section 4.5.1, and year fixed effects denoted by τ, to control for firm-invariant changes in CSR scoring (e.g., changes in the ASSET4 valuation methods).

[Insert Table 6 here.]

Table 6 reports the results on the influence of ownership characteristics on the firm ESG score as well as for the subscores in the subsequent year. Column 4 shows a positive coefficient on ownership ESG score, significant at the 1% level. Columns 1 to 3 confirm this positive relation

regarding each subcategory, significant at least at the 10% level. These results show the first empirical evidence that corporate executives are responding to their owners' eco-social preferences or demands (H1b). Except for the social dimension, coefficients on ownership heterogeneity are significantly negative. This indicates that if firms are confronted by owners who are more disunited in their eco-social preferences, CSR performance will be lower (H2b). This accords with the expectation that conflicting shareholder interests lead to challenges for management and shareholder agreement on the appropriateness of an action (Goranova and Ryan, 2014) and confirms the corollary hypothesis that a unified voice among corporate owners in terms of eco-social preferences positively affects CSR efforts (Dimson et al., 2015).

Also, hypothesis H3b regarding the inherent interest of universal ownership to reduce negative and encourage positive externalities by promoting CSR can be confirmed by the positive and significant relationship between the number of ownership holdings and future CSR performance in all specifications. Furthermore, hypothesis H4b is confirmed in that a positive change in long-term ownership is associated with increased future CSR performance, indicated by the negative coefficients on ownership turnover. Since coefficients on changes in ownership return are consistently negative, more financially successful owners seem to be a driving cause of reduced CSR activity.

4.5.3 Reverse causality: Does CSR performance attract characteristic ownerships?

A potential concern is that our findings on the relationship between ownership characteristics and future CSR performance are not driven by the influence of owners as set out in the hypotheses, but are merely a consequence of positive or negative screening based on CSR criteria in the owners' investment decision process. Accordingly, the ESG score of the selected firms would predict the level of the ownerships' eco-social awareness or other ownership characteristics and thus call the causation of our coefficient estimates into question.

To determine whether ownership characteristics govern a firm's CSR performance, we follow Holtz-Eakin et al. (1988) and test Granger causality within a panel vector autoregressive (VAR) framework.[23] Contrary to a related approach used by Dyck et al. (2019), we use first differences instead of firm fixed effects to control for endogeneity caused by the dynamic panel setup. However, our results remain unchanged when using firm fixed effects instead.

Panel A of Table 7 reports the causal relationship between ownership ESG scores and the corresponding firm scores. The coefficient estimates of the first four columns correspond to the results in Table 6 and show a positive and significant impact of ownership on future CSR performance, whereas Columns 5 to 8 report that future ownership ESG scores do not depend on firms' CSR performance. We therefore do not find evidence for the screening hypothesis or reverse causality regarding the relation between ownership ESG score and CSR performance.

Panel B of Table 7 shows the causality checks for the remaining ownership characteristics. A significant influence of CSR performance on the future characteristics of owners (second column in each case) would mean that the CSR performance of a firm would "attract" a characteristic ownership. It would, therefore, be conceivable that firms that operate in a more sustainable manner would be particularly appealing to long-term oriented, universal or homogeneous owners. We also find no empirical support for this supposition. Instead, we find confirmation for our baseline results of ownership characteristics driving CSR performance. However, the low negative correlation between CSR performance and future ownership return suggests that firms with higher CSR commitment tend to "scare off" investors with a stronger

[23] In particular, we estimate a symmetric pair of panel VAR models. The first is identical to the model defined in Equation (10), in which firms' future CSR performance is considered to depend on ownership score. In the second regression the respective future ownership ESG score depends on CSR performance, the lagged ownership score as an instrument for ownership score and controls. These pairwise regressions are also performed for the remaining ownership characteristics.

focus on returns. This would also be in line with the conjecture that CSR-oriented investors may be prepared to forfeit financial performance for better ESG performance.

[Insert Table 7 here.]

4.6 Further robustness tests

We perform several additional analyses to test the robustness of our results. In our main analysis, we capture unobserved and time-invariant firm characteristics that influence the variation in CSR activities by controlling for firm fixed effects. Several related investigations instead use fixed effects to capture unobserved heterogeneity in country or industry attributes (e.g., Dimson et al., 2015; Dyck et al., 2019; Chen et al., 2020). To establish comparability with these empirical settings, we introduce a country and industry fixed effects specification in Appendix B1. Compared to our main findings in Table 5, the coefficient estimates in these additional specifications are higher. This is in accordance with expectations, as the estimates are less dependent on the cross-sectional variation and more on the likely lower time-series variation within firms. However, this procedure might lead to omitted (firm-level) variable bias, since it cannot be assumed that firms are fully homogeneous either within industries or countries.

Second, we review our findings using the ranked-based ESG scores provided by ASSET4 ESG. As described in Section 4.2.1, to avoid distorting the development of individual firm scores over time, for our investigation we use specially calculated raw ESG scores that are not related to all firm scores evaluated in the respective year. Since our analysis in Table 5 is a contemporary view, it should make no difference whether ranked or raw scores are used. Appendix B2 confirms this expectation for the main results. To address further concerns about the ESG data used, we repeat our analysis using ESG ratings from the alternative data provider

"Sustainalytics". As Appendix B3 shows, our main findings remain unchanged economically and statistically.

Third, we argue that using the overall institutional ownership share as an explanatory variable for the estimation of CSR performance by previous studies is a rather superficial methodological approach since it is based on the blanket assumption of homogeneous owner interests or characteristics. By using the ownership characteristics presented here as explanatory variables, we offer a methodological improvement for the investigation of ownership influence on firm characteristics in general, and on CSR in specific. To demonstrate this, we include the overall institutional ownership share in our baseline model as a control. As expected, Appendix B4 shows that the influence of the institutional ownership share on CSR is insignificant and our outcomes for ownership characteristics remain unaffected in all specifications.

4.7 Conclusion

Do investors have any influence on the activities of the firms they own? In times of growing social and ecological awareness, this question is at the heart of a debate on whether investors can stimulate CSR activities, for example by (threatening) the divestment of shares or by shareholder engagement. We contribute to this debate by providing a novel methodology to directly measure explicit ownership preferences with respect to ESG criteria and relating these to the CSR performance of the firms they own. This novel approach addresses several points of criticism of previous approaches, provides a new category of firm-level variables and thus opens up a multitude of possible investigations on the influence of ownership on corporations − not only with regard to ESG and CSR.

Our analysis of a comprehensive sample of publicly traded firms from 2002 to 2017 provides global evidence that ownership characteristics drive CSR performance. In particular, we find

that stronger eco-social preferences, as shown by the owners' investment habits, are positively related to a firm's efforts to improve its CSR performance. Irrespective of whether this results from an active influence of shareholders or from a proactive adjustment of the firm, it implies that corporate management is responding to the eco-social demands of its principals. However, if corporate management is confronted with owners who show a higher degree of heterogeneity regarding their eco-social preferences, this results in lower CSR performance. Further, we find first empirical evidence for the positive influence of universal as well as long-term ownership on CSR performance in line with theoretical assumptions articulated in the relevant literature.

We hope that this study inspires future work on better understanding the shareholders' potential to drive corporate businesses, especially with regard to meeting their eco-social preferences. On the other hand, this study is also intended to make (prospective) shareholders aware of their participation rights and thus of their own social responsibility. Furthermore, an outstanding empirical task is to determine whether this kind of shareholder primacy has the potential to enhance financial benefits. Finally, we hope that the methodological contribution of this article shifts the direction of ownership research towards the integration of quantifiable owner preferences.

Appendix

Appendix A: Assessment of ASSET4 ESG Indicators

We translate ASSET4 ESG indicators to indicator values following Dyck et al. (2019). ASSET4 ESG indicators are answers to numerical, Y/N, or double Y/N questions with a positive or negative scaling. A numerical answer with positive (negative) scaling is translated to 1 (0) if it is above the numeric threshold (median or zero), and to 0 (1) otherwise. Answers to a Y/N question with positive (negative) scaling are translated to 1 (0) if the answer is "Y", and 0 (1) otherwise. Answers to double Y/N question are translated following the same logic (i.e. for questions with positive scaling: 0 for "NN", 0.5 for "YN" or "NY", and 1 for "YY").

Panel A: Environmental

Code (Mnemonic)		Description	Scaling	Units	Numeric Threshold
I. Emission Reduction					
ENERO02V	Biodiversity Controversies	Is the company under the spotlight of the media because of a controversy linked to biodiversity?	Negative	Y/N	
ENERO01V	Biodiversity Impact	Does the company report on initiatives to protect, restore or reduce its impact on native ecosystems and species, biodiversity, protected and sensitive areas?	Positive	Y/N	
ENERO04V	Cement CO2 Emissions	Total CO2 and CO2 equivalents emission in kilograms per tonne of cement produced.	Negative	Number	median
ENERO22V	Climate Change Risks and Opportunities	Is the company aware that climate change can represent commercial risks and/or opportunities?	Positive	Y/N	
ENERO05V	CO2 Reduction	Does the company show an initiative to reduce, reuse, recycle, substitute, phased out or compensate CO2 equivalents in the production process?	Positive	Y/N	
ENERO13V	Discharge into Water System	Total weight of water pollutant emissions in tonnes divided by net sales or revenue in US dollars.	Negative	Number	median
ENERO23V	Environmental Compliance	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding environmental controversies in US dollars.	Negative	Number	zero
ENERO24V	Environmental Expenditures	Does the company report on its environmental expenditures or does the company report to make proactive environmental investments to reduce future risks or increase future opportunities?	Positive	Y/N	
ENERO17V	Environmental Management Systems	The percentage of company sites or subsidiaries that are certified with any environmental management system.	Positive	Number	median
ENERO16V	Environmental Partnerships	Does the company report on partnerships or initiatives with specialized NGOs, industry organizations, governmental or supragovernmental organizations that focus on improving environmental issues?	Positive	Y/N	
ENERO18V	Environmental Restoration Initiatives	Does the company report or provide information on company-generated initiatives to restore the environment?	Positive	Y/N	
ENERO06V	F-Gases Emissions	Does the company report on initiatives to recycle, reduce, reuse or phase out fluorinated gases such as HFCs (hydrofluorocarbons), PFCs (perfluorocarbons) or SF6 (sulphur hexafluoride)?	Positive	Y/N	
ENERO03V	Greenhouse Gas Emissions	Total CO2 and CO2 equivalents emission in tonnes divided by net sales or revenue in US dollars.	Negative	Number	median
ENERO12V	Hazardous Waste	Total amount of hazardous waste produced in tonnes divided by net sales or revenue in US dollars.	Negative	Number	median
ENERD02V	Implementation	Does the company describe the implementation of its emission reduction policy through a public commitment from a senior management or board member? AND Does the company describe the implementation of its emission reduction policy through the processes in place?	Positive	Double Y/N	
ENERD04V	Improvements	Does the company set specific objectives to be achieved on emission reduction?	Positive	Y/N	
ENERO15V	Innovative Production	Does the company report on the concentration of production locations in order to limit the environmental impact during the production process? OR Does the company report on its participation in any emissions trading initiative? OR Does the company report on new production techniques to improve the global environmental impact (all emissions) during the production process?	Positive	Y/N	
ENERD03V	Monitoring	Does the company monitor its emission reduction performance?	Positive	Y/N	
ENERO08V	NOx and SOx Emissions Reduction	Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SOx (sulphur oxides) or NOx (nitrogen oxides) emissions?	Positive	Y/N	
ENERO07V	Ozone-Depleting Substances Reduction	Does the company report on initiatives to reduce, substitute, or phase out ozone-depleting (CFC-11 equivalents, chlorofluorocarbon) substances?	Positive	Y/N	

ENERD01V	Policy	Does the company have a policy for reducing environmental emissions or its impacts on biodiversity? AND Does the company have a policy for maintaining an environmental management system?	Positive	Double Y/N	
ENERO21V	Spill Impact Reduction	Does the company report on initiatives to reduce, avoid or minimize the effects of spills or other polluting events (crisis management system)?	Positive	Y/N	
ENERO20V	Spills and Pollution Controversies	Is the company directly or indirectly (through a supplier) under the spotlight of the media because of a controversy linked to the spill of chemicals, oils and fuels, gases (flaring) or controversy relating to the overall impacts of the company on the environment?	Negative	Y/N	
ENERO19V	Transportation Impact Reduction	Does the company report on initiatives to reduce the environmental impact of transportation of its products or its staff?	Positive	Y/N	
ENERO09V	VOC Emissions Reduction	Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC) or particulate matter less than ten microns in diameter (PM10)?	Positive	Y/N	
ENERO10V	Waste	Total amount of waste produced in tonnes divided by net sales or revenue in US dollars.	Negative	Number	median
ENERO11V	Waste Recycling Ratio	Total recycled and reused waste produced in tonnes divided by total waste produced in tonnes.	Positive	Number	median
ENERO14V	Waste Reduction	Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out total waste, hazardous waste or wastewater?	Positive	Y/N	
II. Product Innovation					
ENPIO19V	Animal Testing	Is the company endorsing guidelines on animal testing (e.g., the EU guideline on animal experiments)? OR Has the company established a programme or an initiative to reduce, phase out or substitute for animal testing?	Positive	Y/N	
ENPIO13V	Eco-Design Products	Does the company report on specific products which are designed for reuse, recycling or the reduction of environmental impacts?	Positive	Y/N	
ENPIO02V	Energy Footprint Reduction	Does the company describe initiatives in place to reduce the energy footprint of its products during their use?	Positive	Y/N	
ENPIO09V	Environmental Asset Management	Does the company report on assets under management which employ environmental screening criteria or environmental factors in the investment selection process?	Positive	Y/N	
ENPIO20V	Environmental Labels and Awards	Has the company received product awards with respect to environmental responsibility? OR Does the company use product labels (e.g., FSC, Energy Star, MSC) indicating the environmental responsibility of its products?	Positive	Y/N	
ENPIO01V	Environmental Products	Does the company report on at least one product line or service that is designed to have positive effects on the environment or which is environmentally labelled and marketed?	Positive	Y/N	
ENPIO10V	Environmental Project Financing	Is the company a signatory of the Equator Principles (commitment to manage environmental issues in project financing)? OR Does the company claim to evaluate projects on the basis of environmental or biodiversity risks as well?	Positive	Y/N	
ENPIO04V	Environmental R&D	Does the company invest in R&D on new environmentally friendly products or services that will limit the amount of emissions and resources needed during product use?	Positive	Y/N	
ENPIO03V	Environmental R&D Expenditures	Total amount of environmental R&D costs (without clean up and remediation costs) divided by net sales or revenue in US dollars.	Positive	Number	median
ENPIO17V	GMO Free Products	Does the company make a commitment to exclude GMO ingredients from its products or retail offerings?	Positive	Y/N	
ENPIO06V	Hybrid Vehicles	Is the company developing hybrid vehicles?	Positive	Y/N	
ENPID02V	Implementation	Does the company describe the implementation of its environmental product innovation policy?	Positive	Y/N	
ENPID04V	Improvements	Does the company set specific objectives to be achieved on environmental product innovation?	Positive	Y/N	
ENPIO14V	Labelled Wood Percentage	The percentage of labelled wood or forest products (e.g., Forest Stewardship Council (FSC)) from total wood or forest products.	Positive	Number	median
ENPIO12V	Liquefied Natural Gas	Does the company develop new products and services linked to liquefied natural gas?	Positive	Y/N	
ENPID03V	Monitoring	Does the company describe, claim to have or mention the processes it uses to accomplish environmental product innovation?	Positive	Y/N	
ENPIO05V	Noise Reduction	Does the company develop new products that are marketed as reducing noise emissions?	Positive	Y/N	
ENPIO15V	Organic Products	Does the company report or show initiatives to produce or promote organic food or other products?	Positive	Y/N	
ENPID01V	Policy	Does the company have an environmental product innovation policy (eco-design, life cycle assessment, dematerialization)?	Positive	Y/N	
ENPIO21V	Product Impact Controversies	Is the company under the spotlight of the media because of a controversy linked to the environmental impact of its products or services?	Negative	Y/N	

ENPIO16V	Product Impact Minimization	Does the company report about take-back procedures and recycling programmes to reduce the potential risks of products entering the environment? OR Does the company report about product features and applications or services that will promote responsible, efficient, cost-effective and environmentally preferable use?	Positive	Y/N	
ENPIO11V	Renewable Energy Supply	Total energy distributed or produced from renewable energy sources divided by the total energy distributed or produced.	Positive	Number	median
ENPIO07V	Renewable	Does the company develop products or technologies for use in the clean, renewable energy (such as wind, solar, hydro and geo-thermal and biomass power)?	Positive	Y/N	
ENPIO18V	Sustainable Building Products	Does the company develop products and services that improve the energy efficiency of buildings?	Positive	Y/N	
ENPIO08V	Water Technologies	Does the company develop products or technologies that are used for water treatment, purification or that improve water use efficiency?	Positive	Y/N	
III. Resource Reduction					
ENRRO05V	Cement Energy Use	Total energy use in gigajoules per tonne of clinker produced.	Negative	Number	median
ENRRO08V	Energy Efficiency Initiatives	Does the company report on initiatives to use renewable energy sources? AND Does the company report on initiatives to increase its energy efficiency overall?	Positive	Double Y/N	
ENRRO04V	Energy Use	Total direct and indirect energy consumption in gigajoules divided by net sales or revenue in US dollars.	Negative	Number	median
ENRRO13V	Environmental Resource Impact Controversies	Is the company under the spotlight of the media because of a controversy linked to the environmental impact of its operations on natural resources or local communities?	Negative	Y/N	
ENRRO11V	Environmental Supply Chain Management	Does the company use environmental criteria (ISO 14000, energy consumption, etc.) in the selection process of its suppliers or sourcing partners? AND Does the company report or show to be ready to end a partnership with a sourcing partner, if environmental criteria are not met?	Positive	Double Y/N	
ENRRO07V	Green Buildings	Does the company have environmentally friendly or green sites or offices?	Positive	Y/N	
ENRRD02V	Implementation	Does the company describe the implementation of its resource efficiency policy through a public commitment from a senior management or board member? AND Does the company describe the implementation of its resource efficiency policy through the processes in place?	Positive	Double Y/N	
ENRRD04V	Improvements	Does the company set specific objectives to be achieved on resource efficiency? AND Does the company comment on the results of previously set objectives?	Positive	Double Y/N	
ENRRO12V	Land Use	Does the company report on initiatives to reduce the environmental impact on land owned, leased or managed for production activities or extractive use?	Positive	Y/N	
ENRRO01V	Materials	Total amount of materials used in tonnes divided by net sales or revenue in US dollars.	Negative	Number	median
ENRRO02V	Materials Recycled and Reused Ratio	The percentage of recycled materials of the total materials used.	Positive	Number	median
ENRRD03V	Monitoring	Does the company monitor its resource efficiency performance?	Positive	Y/N	
ENRRD01V	Policy	Does the company have a policy for reducing the use of natural resources? AND Does the company have a policy to lessen the environmental impact of its supply chain?	Positive	Double Y/N	
ENRRO06V	Renewable Energy Use	Total energy generated from primary renewable energy sources divided by total energy.	Positive	Number	median
ENRRO03V	Toxic Chemicals	Does the company report on initiatives to reduce, reuse, substitute or phase out toxic chemicals or substances?	Positive	Y/N	
ENRRO10V	Water Recycling	Does the company report on initiatives to reuse or recycle water? OR Does the company report on initiatives to reduce the amount of water used?	Positive	Y/N	
ENRRO09V	Water Use	Total water withdrawal in cubic meters divided by net sales or revenue in US dollars.	Negative	Number	median

Panel B: Social

Code (Mnemonic)		Description	Scaling	Units	Numeric Threshold
I. Product Responsibility					
SOPRD01V	Policy	Does the company have a policy to protect customer health & safety? AND Does the company have a products and services quality policy?	Positive	Double Y/N	
SOPRD02V	Implementation	Does the company describe the implementation of its product responsibility policy?	Positive	Y/N	
SOPRD03V	Monitoring	Does the company monitor the impact of its products or services on consumers or the community more generally?	Positive	Y/N	

SOPRD04V	Improvements	Does the company set specific objectives to be achieved on its products or services quality and responsibility?	Positive	Y/N	
SOPRO01V	Quality Management	Does the company claim to apply quality management systems, such as ISO 9000, Six Sigma, Lean Manufacturing, Lean Sigma, TQM or any other similar quality principles?	Positive	Y/N	
SOPRO02V	Product Access	Does the company distribute any low-priced products or services specifically designed for lower income categories (e.g., bridging the digital divide, telecommunications, low cost cars and micro-financing services)?	Positive	Y/N	
SOPRO03V	Technology Know-How Sharing	Does the company voluntarily share licenses, patents, intellectual property or useful technology with developing countries, or allow generics under specific conditions?	Positive	Y/N	
SOPRO08V	Social Exclusion Controversies	Is the company under the spotlight of the media because of a controversy linked to market withdrawal (closing of branches), retreating or failing to serve specific markets or customers?	Negative	Y/N	
SOPRO11V	Customer Controversies	Is the company under the spotlight of the media because of a controversy linked to its products or services quality and responsibility?	Negative	Y/N	
SOPRO12V	Product Compliance	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding controversies linked its products or services quality and responsibility in US dollars.	Negative	Number	zero
II. Community					
SOCOD01V	Policy	Does the company have a policy to strive to be a good corporate citizen or endorse the Global Sullivan Principles? AND Does the company have a policy to respect business ethics or has the company signed the UN Global Compact or follow the OECD guidelines?	Positive	Double Y/N	
SOCOD02V	Implementation	Does the company describe the implementation of its community policy through a public commitment from a senior management or board member? AND Does the company describe the implementation of its community policy through the processes in place?	Positive	Double Y/N	
SOCOD03V	Monitoring	Does the company monitor its reputation or its relations with communities?	Positive	Y/N	
SOCOD04V	Improvements	Does the company set specific objectives to be achieved on its reputation or its relations with communities?	Positive	Y/N	
SOCOO01V	Total Donations	Total amount of all donations divided by net sales or revenue.	Positive	Number	zero
SOCOO02V	Donations in General	Does the company make cash donations? AND Does the company make in-kind donations, foster employee engagement in voluntary work or provide funding of community-related projects through a corporate foundation?	Positive	Double Y/N	
SOCOO03V	Income Taxes	Total amount of income taxes divided by net income.	Positive	Number	median
SOCOO04V	Corporate Responsibility Awards	Has the company received an award for its social, ethical, community, or environmental activities or performance?	Positive	Y/N	
SOCOO06V	Critical Countries - Indigenous People Controversies	Is the company under the spotlight of the media because of a controversy linked to activities in critical, undemocratic countries that do not respect fundamental human rights or to disrespecting the rights of indigenous people?	Negative	Y/N	
SOCOO07V	Patent Infringement	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding controversies linked to patents and intellectual property infringement in US dollars.	Negative	Number	zero
SOCOO08V	Crisis Management	Does the company report on crisis management systems or reputation disaster recovery plans to reduce or minimize the effects of reputation disasters?	Positive	Y/N	
SOCOO09V	Public Health Controversies	Is the company under the spotlight of the media because of a controversy linked to public health or industrial accidents harming the health & safety of third parties (non-employees and non-customers)?	Negative	Y/N	
SOCOO10V	Bribery, Corruption and Fraud Controversies	Is the company under the spotlight of the media because of a controversy linked to bribery and corruption, political contributions, improper lobbying, money laundering, parallel imports or any tax fraud?	Negative	Y/N	
SOCOO11V	Business Ethics Compliance	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding controversies linked to business ethics in general, political contributions or bribery and corruption, price-fixing or anti-competitive behavior, tax fraud, parallel imports or money laundering in US dollars.	Negative	Number	zero
III. Human Rights					
SOHRD01V	Policy	Does the company have a policy to guarantee the freedom of association universally applied independent of local laws? AND Does the company have a policy for the exclusion of child, forced or compulsory labor?	Positive	Double Y/N	
SOHRD02V	Implementation	Does the company describe the implementation of its human rights policy?	Positive	Y/N	
SOHRD03V	Monitoring	Does the company monitor human rights in its or its suppliers' facilities?	Positive	Y/N	
SOHRD04V	Improvements	Does the company set specific objectives to be achieved on its human rights policy?	Positive	Y/N	

SOHRO01V	Suppliers Social Impact	Does the company report or show to use human rights criteria in the selection or monitoring process of its suppliers or sourcing partners? AND Does the company report or show to be ready to end a partnership with a sourcing partner if human rights criteria are not met?	Positive	Double Y/N	
SOHRO02V	Freedom of Association Controversies	Is the company under the direct or indirect (through suppliers) spotlight of the media because of a controversy linked to freedom of association?	Negative	Y/N	
SOHRO03V	Child Labor Controversies	Is the company under the direct or indirect (through suppliers) spotlight of the media because of a controversy linked to child labor?	Negative	Y/N	
SOHRO04V	Human Rights Controversies	Is the company under the direct or indirect (through suppliers) spotlight of the media because of a controversy linked to general human rights issues?	Negative	Y/N	
IV. Diversity and Opportunity					
SODOD01V	Policy	Does the company have a work-life balance policy? AND Does the company have a diversity and equal opportunity policy?	Positive	Double Y/N	
SODOD02V	Implementation	Does the company describe the implementation of its diversity and opportunity policy?	Positive	Y/N	
SODOD03V	Monitoring	Does the company monitor the diversity and equal opportunities in its workforce?	Positive	Y/N	
SODOD04V	Improvements	Does the company set specific objectives to be achieved on diversity and equal opportunity?	Positive	Y/N	
SODOO01V	Managers Female Male Ratio	Percentage of women managers.	Positive	Number	median
SODOO02V	Management Equal Opportunity	Does the company promote positive discrimination? OR Has the company won any prize or award relating to diversity or opportunity?	Positive	Y/N	
SODOO03V	Work-Life Balance	Does the company claim to provide generous vacations, career breaks or sabbaticals? OR Does the company claim to provide flexible working hours or working hours that promote a work-life balance?	Positive	Y/N	
SODOO04V	Family Friendly	Does the company claim to provide day care services for its employees? OR Does the company claim to provide generous maternity leave benefits? OR Has the company won a family friendly prize like a "Working Mother Award"?	Positive	Y/N	
SODOO05V	Diversity Controversies	Is the company under the spotlight of the media because of a controversy linked to workforce diversity and opportunity?	Negative	Y/N	
SODOO06V	Diversity Compliance	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding controversies linked to workforce diversity and opportunity in US dollars.	Negative	Number	median
V. Employment Quality					
SOEQD01V	Policy	Does the company have a competitive employee benefits policy or ensuring good employee relations within its supply chain? AND Does the company have a policy for maintaining long term employment growth and stability?	Positive	Double Y/N	
SOEQD02V	Implementation	Does the company describe the implementation of its employment quality policy?	Positive	Y/N	
SOEQD03V	Monitoring	Does the company monitor or measure its performance on employment quality?	Positive	Y/N	
SOEQD04V	Improvements	Does the company set specific objectives to be achieved on employment quality?	Positive	Y/N	
SOEQO01V	Salaries	Average salaries and benefit in US dollars (Salaries and Benefits (US dollars) /Total Number of Employees).	Positive	Number	median
SOEQO02V	Salaries Distribution	Total salaries and benefits divided by net sales or revenue.	Positive	Number	median
SOEQO03V	Bonus Plan	Does the company claim to provide a bonus plan to at least the middle management level? AND Is the employees' compensation based on personal or company-wide targets?	Positive	Double Y/N	
SOEQO04V	Generous Fringe Benefits	Does the company claim to provide its employees with a pension fund, health care or other insurances?	Positive	Y/N	
SOEQO05V	Employment Awards	Has the company won an award or any prize related to general employment quality or "Best Company to Work For"?	Positive	Y/N	
SOEQO06V	Salary Gap	CEO's total salary (or other highest salary) divided by average wage (Highest Salary (US dollars) /Average Salaries and Benefits in (US dollars)).	Negative	Number	median
SOEQO07V	Trade Union Representation	Percentage of employees represented by independent trade union organizations or covered by collective bargaining agreements.	Positive	Number	median
SOEQO08V	Net Employment Creation	Employment growth over the last year.	Positive	Number	median
SOEQO09V	Personnel Turnover	Percentage of employee turnover.	Negative	Number	median
SOEQO10V	Announced Lay-offs	Total number of announced lay-offs by the company divided by the total number of employees.	Negative	Number	median
SOEQO11V	Key Management Departures	Has an important executive management team member or a key team member announced a voluntary departure (other than for retirement) or has been ousted?	Negative	Y/N	

SOEQO12V	Strikes	Has there has been a strike or an industrial dispute that led to lost working days?	Negative	Y/N	
SOEQO13V	Wages or Working Condition Controversies	Is the company under the spotlight of the media because of a controversy linked to the company's employees, contractors or suppliers due to wage, layoff disputes or working conditions?	Negative	Y/N	
VI. Health and Safety					
SOHSD01V	Policy	Does the company have a policy to improve employee health & safety within the company and its supply chain?	Positive	Y/N	
SOHSD02V	Implementation	Does the company describe the implementation of its employee health & safety policy through a public commitment from a senior management or board member or the establishment of an employee health & safety team? AND Does the company describe the implementation of its employee health & safety policy through the processes in place?	Positive	Double Y/N	
SOHSD03V	Monitoring	Does the company monitor or measure its performance on employee health & safety?	Positive	Y/N	
SOHSD04V	Improvements	Does the company set specific objectives to be achieved on employee health & safety? AND Does the company comment on the results of previously set objectives?	Positive	Double Y/N	
SOHSO01V	Injuries	Total number of injuries and fatalities including no-lost-time injuries relative to one million hours worked.	Negative	Number	median
SOHSO02V	Lost Days	Total lost days at work divided by total working days. (Refers to an employee absent from work because of incapacity of any kind, not just as the result of occupational injury or disease)	Negative	Number	median
SOHSO03V	HIV-AIDS Programme	Does the company report on policies or programmes on HIV/AIDS for the workplace or beyond?	Positive	Y/N	
SOHSO04V	Health & Safety Controversies	Is the company under the spotlight of the media because of a controversy linked to workforce health and safety?	Negative	Y/N	
SOHSO05V	Health & Safety Compliance	All real or estimated penalties, fines from lost court cases, settlements or cases not yet settled regarding controversies linked to workforce or contractor health and safety in US dollars.	Negative	Number	zero
SOTDD01V	Policy	Does the company have a policy to support the skills training or career development of its employees?	Positive	Y/N	
SOTDD02V	Implementation	Does the company describe the implementation of its training and development policy?	Positive	Y/N	
SOTDD03V	Monitoring	Does the company monitor its training and development programs?	Positive	Y/N	
SOTDD04V	Improvements	Does the company set specific objectives to be achieved on the employee training and career development?	Positive	Y/N	
SOTDO01V	Training Hours	Average hours of training per year per employee.	Positive	Number	median
SOTDO02V	Training Costs	Training costs per employee in US dollars.	Positive	Number	median
SOTDO03V	Internal Promotion	Does the company claim to favor promotion from within?	Positive	Y/N	
SOTDO04V	Management Training	Does the company claim to provide regular staff and business management training for its managers?	Positive	Y/N	
SOTDO05V	University Partnerships	Does the company claim to cooperate with schools or universities?	Positive	Y/N	
SOTDO06V	Supplier ESG Training	Does the company provide training on environmental, social or governance factors for its suppliers?	Positive	Y/N	

Panel C: Corporate Governance

Code (Mnemonic)		Description	Scaling	Units	Numeric Threshold
I. Board Functions					
CGBFD01V	Policy	Does the company have a policy for maintaining effective board functions?	Positive	Y/N	
CGBFD02V	Implementation	Does the company describe the implementation of its board functions policy?	Positive	Y/N	
CGBFD03V	Monitoring	Does the company monitor the board functions through the establishment of a corporate governance committee?	Positive	Y/N	
CGBFD04V	Improvements	Does the company have the necessary internal improvement and information tools to develop appropriate and effective board functions?	Positive	Y/N	
CGBFO01V	Audit Committee Independence	Percentage of independent board members on the audit committee as stipulated by the company.	Positive	Number	median
CGBFO02V	Audit Committee Management Independence	Does the company report that all audit committee members are non-executives?	Positive	Y/N	
CGBFO03V	Audit Committee Expertise	Does the company have an audit committee with at least three members and at least one "financial expert" within the meaning of Sarbanes-Oxley?	Positive	Y/N	

CGBFO04V	Compensation Committee Independence	Percentage of independent board members on the compensation committee as stipulated by the company.	Positive	Number	median
CGBFO05V	Compensation Committee Management Independence	Does the company report that all compensation committee members are non-executives?	Positive	Y/N	
CGBFO06V	Nomination Committee Independence	Percentage of non-executive board members on the nomination committee.	Positive	Number	median
CGBFO07V	Nomination Committee Management Independence	Are the majority of the nomination committee members non-executives?	Positive	Y/N	
CGBFO08V	Nomination Committee Processes	Does the nomination committee have the responsibility for the selection, appointment and succession procedures for board members or executives? OR Does the company report or show to constantly supervise the performance of board members or executives?	Positive	Y/N	
CGBFO09V	Nomination Committee Involvement	Percentage of nomination committee members who are significant shareholders (more than 5%).	Positive	Number	median
CGBFO10V	Board Meetings	Number of board meetings per year.	Positive	Number	median
CGBFO11V	Board Attendance	Does the company publish information about the attendance of the individual board members at board meetings?	Positive	Y/N	
CGBSD01V	Policy	Does the company have a policy for maintaining a well-balanced membership of the board?	Positive	Y/N	
CGBSD02V	Implementation	Does the company describe the implementation of its balanced board structure policy?	Positive	Y/N	
CGBSD03V	Monitoring	Does the company monitor the board functions through the establishment of a nomination committee?	Positive	Y/N	
CGBSD04V	Improvements	Does the company have the necessary internal improvement and information tools to develop balanced board structure?	Positive	Y/N	
CGBSO01V	Size of Board	Total number of board members which are in excess of ten or below eight.	Negative	Number	median
CGBSO02V	Background and Skills	Does the company describe the professional experience or skills of every board member? OR Does the company provide information about the age of individual board members?	Positive	Y/N	
CGBSO03V	Board Diversity	Is there female representation on the board? OR Is there foreign culture representation on the board?	Positive	Y/N	
CGBSO04V	Specific Skills	Percentage of board members who have either an industry specific background or a strong financial background.	Positive	Number	median
CGBSO05V	Experienced Board	Average number of years each board member has been on the board.	Positive	Number	median
CGBSO06V	Non-Executive Board Members	Percentage of non-executive board members.	Positive	Number	median
CGBSO07V	Independent Board Members	Percentage of independent board members as reported by the company.	Positive	Number	median
CGBSO08V	Strictly Independent Board Members	Percentage of strictly independent board members (not employed by the company; not served on the board for more than ten years; not a reference shareholder with more than 5% of holdings; no cross-board membership; no recent, immediate family ties to the corporation; not accepting any compensation other than compensation for board service).	Positive	Number	median
CGBSO09V	CEO-Chairman Separation	Does the CEO simultaneously chair the board? AND Has the chairman of the board been the CEO of the company?	Negative	Double Y/N	
CGBSO10V	Mandates Limitation	Does the company provide information about the other mandates of individual board members? AND Does the company stipulate a limit of the number of years of board membership?	Positive	Double Y/N	
CGBSO11V	Board Member Affiliations	Average number of other corporate affiliations for the board member.	Negative	Number	median
CGBSO12V	Individual Reelection	Are all board member individually subject to re-election (no classified or staggered board structure)?	Positive	Y/N	
CGBSO13V	Term Duration	The interval of years in which the board members are subject to re-election.	Negative	Number	median
CGBSO14V	Active Board Members	The total number of board members at the end of the fiscal year.	Not applicable	Number	median
CGBSO15V	Board Members with CV	Total number of board members with publicly disclosed professional background/CV.	Not applicable	Number	median
CGBSO17V	Board Gender Diversity	Percentage of women on the board of directors.	Not applicable	Number	median
II. Compensation Policy					
CGCPD01V	Policy	Does the company have a policy for performance-oriented compensation that attracts and retain the senior executives and board members?	Positive	Y/N	

CGCPD02V	Implementation	Does the company describe the implementation of its compensation policy?	Positive	Y/N	
CGCPD03V	Monitoring	Does the company monitor the senior executives and board compensation through the establishment of a compensation committee?	Positive	Y/N	
CGCPD04V	Improvements	Does the company have the necessary internal improvement and information tools to develop attractive and performance-oriented compensation policy?	Positive	Y/N	
CGCPO01V	Individual Compensation	Does the company provide information about the total individual compensation of all executives and board members?	Positive	Y/N	
CGCPO02V	Highest Remuneration Package	Highest remuneration package within the company in US dollars.	Negative	Number	median
CGCPO03V	Board Member Compensation	Total compensation of the non-executive board members in US dollars.	Negative	Number	median
CGCPO04V	Remuneration Structure	Does the company subdivide the remuneration of executives according to fixed salaries, bonuses and stock option plans (or restricted stocks)?	Positive	Y/N	
CGCPO05V	Stock Option Program	Does the company's statutes or by-laws require that stock-options are only granted with a vote at a shareholder meeting?	Positive	Y/N	
CGCPO06V	Stock Compensation	Do the company's most recently granted stocks or stock options vest in a three-year period at a minimum?	Positive	Y/N	
CGCPO07V	Long Term Objectives	Is the management and board members remuneration partly linked to objectives or targets which are more than two years forward looking?	Positive	Y/N	
CGCPO08V	Compensation Controversies	Is the company under the spotlight of the media because of a controversy linked to high executive or board compensation?	Negative	Y/N	
CGCPO09V	Sustainability Compensation Incentives	Is the senior executive's compensation linked to CSR/H&S/Sustainability targets?	Positive	Y/N	
III. Vision and Strategy					
CGVSD01V	Policy	Does the company have a policy for maintaining an overarching vision and strategy that integrates financial and extra-financial aspects of its business?	Positive	Y/N	
CGVSD02V	Implementation	Does the company describe the implementation of its integrated strategy through a public commitment from a senior management or board member? AND Does the company describe the implementation of its integrated strategy through the establishment of a CSR committee or team?	Positive	Double Y/N	
CGVSD03V	Monitoring	Does the company monitor its integrated strategy through belonging to a specific sustainability index? AND Does the company monitor its integrated strategy through conducting external audits on its reporting?	Positive	Double Y/N	
CGVSD04V	Improvements	Does the company set specific objectives to be achieved on the integrated strategy?	Positive	Y/N	
CGVSO01V	Challenges and Opportunities	Does the company report about the challenges or opportunities linked to the integration of financial and extra-financial issues?	Positive	Y/N	
CGVSO02V	Integrated Strategy	Does the company integrate financial and extra-financial factors in the management discussion and analysis section of the annual report?	Positive	Y/N	
CGVSO03V	Global Compact Signatory	Is the company a signatory of the Global Compact?	Positive	Y/N	
CGVSO04V	Stakeholder Engagement	Does the company explain how it engages with its stakeholders?	Positive	Y/N	
CGVSO05V	Transparency	Does the company publish a separate CSR/H&S/Sustainability report or publish a section in its annual report on CSR/H&S/Sustainability?	Positive	Y/N	
CGVSO06V	GRI Report	Is the company's CSR report published in accordance with the GRI guidelines?	Positive	Y/N	
CGVSO07V	Global Reporting	Does the company's extra-financial report take into account of the global activities of the company?	Positive	Y/N	
CGVSO08V	CSR Reporting Auditor	Does the company have an external auditor of its CSR/H&S/Sustainability report?	Positive	Y/N	
IV. Shareholder Rights					
CGSRD01V	Policy	Does the company have a policy for ensuring equal treatment of minority shareholders, facilitating shareholder engagement or limiting the use of anti-takeover devices?	Positive	Y/N	
CGSRD02V	Implementation	Does the company describe the implementation of its shareholder rights policy?	Positive	Y/N	
CGSRD03V	Monitoring	Does the company monitor the shareholder rights through the establishment of a corporate governance committee?	Positive	Y/N	
CGSRD04V	Improvements	Does the company have the necessary internal improvement and information tools to develop appropriate shareholder rights principles?	Positive	Y/N	
CGSRO01V	Share Structure	Is the company's outstanding equity constituted of 100% common stocks?	Positive	Y/N	
CGSRO02V	Voting Rights	Are all shares of the company providing equal voting rights?	Positive	Y/N	

CGSRO03V	Majority Shareholders	Percentage of shares held by all insiders and 5% owners.	Negative	Number	median
CGSRO04V	Available Articles of Association	Are the company's articles of association, statues or bylaws publicly available or on request?	Positive	Y/N	
CGSRO05V	Ownership	Is the company owned by a reference shareholder who has the majority of the voting rights, veto power or golden share?	Negative	Y/N	
CGSRO06V	Anti-Takeover Devices	The number of anti-takeover devices in place in excess of two.	Negative	Number	median
CGSRO07V	Shareholder Controversies	Is the company under the spotlight of the media because of a controversy linked to shareholders rights?	Negative	Y/N	

Appendix B: Results of Robustness Checks

Table B1
Country and Industry Fixed Effects instead of Firm Fixed Effect

This table reports regression estimates of ESG scores on ownership characteristics, control variables and time, country and industry fixed effects. The sample consists of 42,964 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	Environmental Score	Social Score	Governance Score	ESG Score
Ownership Score	0.189***	0.112***	0.084***	0.107***
	(0.020)	(0.013)	(0.009)	(0.012)
Ownership Heterogeneity	-0.555***	-1.065***	-0.666***	-1.171***
	(0.099)	(0.115)	(0.070)	(0.088)
Ownership Log. # Holdings	0.138	0.161	1.225***	0.407***
	(0.148)	(0.172)	(0.157)	(0.139)
Ownership Turnover	-12.818***	-8.324***	0.623	-5.088**
	(2.614)	(3.047)	(2.323)	(2.302)
Ownership Return	0.103	-0.386	-1.291*	-0.242
	(0.356)	(0.391)	(0.642)	(0.301)
Controls	yes	yes	yes	yes
Observations	42,964	42,964	42,964	42,964
Within R-squared	0.332	0.276	0.262	0.366
Adjusted R-squared	0.594	0.494	0.745	0.589

Table B2
Ranked ASSET4 ESG Scores

This table reports regression estimates of ranked ESG scores provided by ASSET4 ESG on ownership characteristics, control variables and time and firm fixed effects. The sample consists of 41,973 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	Environmental Score	Social Score	Governance Score	ESG-Score
Ownership Score	0.134***	0.093***	0.152***	0.055***
	(0.017)	(0.016)	(0.017)	(0.011)
Ownership Heterogeneity	-0.579***	-0.273***	-0.361***	-0.247***
	(0.074)	(0.062)	(0.059)	(0.067)
Ownership Log. # Holdings	-0.915***	-0.226	1.102***	0.186
	(0.304)	(0.282)	(0.296)	(0.184)
Ownership Turnover	-4.369	-5.958	-11.560***	-2.174
	(4.285)	(3.858)	(3.836)	(2.341)
Ownership Return	-0.780	-1.142*	-3.822***	-0.498
	(0.659)	(0.632)	(0.599)	(0.377)
Controls	yes	yes	yes	yes
Observations	41.973	41.973	41.973	41.973
Within R-squared	0.020	0.015	0.025	0.017
Adjusted R-squared	0.819	0.830	0.853	0.795

Table B3
Sustainalytics ESG Scores instead of ASSET4 ESG Scores

This table reports regression estimates of ranked Sustainalytics ESG scores on ownership characteristics, control variables and time, country and industry fixed effects. The sample consists of 22,570 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	Environmental Score	Social Score	Governance Score	ESG-Score
Ownership Score	0.089***	0.042***	0.054***	0.060***
	(0.014)	(0.011)	(0.010)	(0.010)
Ownership Heterogeneity	-0.882***	-0.534**	-0.439**	-0.645***
	(0.195)	(0.214)	(0.180)	(0.199)
Ownership Log. # Holdings	0.541*	1.027***	0.785***	0.826***
	(0.309)	(0.243)	(0.254)	(0.232)
Ownership Turnover	-15.946***	-11.711***	-1.113	-9.987***
	(4.702)	(3.927)	(4.001)	(3.535)
Ownership Return	2.107***	1.466**	0.660	1.429**
	(0.758)	(0.603)	(0.623)	(0.561)
Controls	yes	yes	yes	yes
Observations	22,570	22,570	22,570	22,570
Within R-squared	0.170	0.079	0.064	0.152
Adjusted R-squared	0.399	0.354	0.415	0.399

Table B4
Institutional Ownership Share as Control

This table reports regression estimates of ESG scores on ownership characteristics and control variables, time and firm fixed effects. The sample consists of 42,237 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	Environmental Score	Social Score	Governance Score	ESG Score
Ownership Score	0.107***	0.028***	0.062***	0.044***
	(0.014)	(0.008)	(0.008)	(0.008)
Ownership Heterogeneity	-0.388***	-0.076	-0.467***	-0.554***
	(0.059)	(0.055)	(0.046)	(0.051)
Ownership Log. # Holdings	-0.108	0.282***	0.726***	0.255***
	(0.099)	(0.098)	(0.110)	(0.082)
Ownership Turnover	-5.947***	-1.818	-8.672***	-4.188***
	(1.415)	(1.363)	(1.403)	(1.110)
Ownership Return	-0.486**	-0.982***	-1.285***	-0.887***
	(0.209)	(0.197)	(0.220)	(0.165)
Institutional Ownership Share	0.228	-0.156	0.621	0.101
	(0.482)	(0.438)	(0.486)	(0.364)
Controls	yes	yes	yes	yes
Observations	42,237	42,237	42,237	42,237
Within R-squared	0.015	0.013	0.029	0.029
Adjusted R-squared	0.893	0.901	0.911	0.091

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Figures and Tables

Table 1: Global market capitalization and ownership coverage

This table shows summary statistics on the yearly coverage of global market capitalization and ownership information of our sample from 2002 to 2017. Global market capitalization is the worldwide market value of common equity according to Worldbank (2018). Aggregated market capitalization is the aggregated market value at each year-end out of our sample of 28,201 firms. We report ownership information regarding the number of owners observed, the number of firms held, the value held in $US (held value in trillion $), and as a proportion of aggregated market capitalization (covered ownership share). The data are from the RDS database, ROP database, and Worldbank (2018).

Year	Global market capitalization	Aggregated market capitalization		Ownership Information			
	Trillion $	Trillion $	As % of global market capitalization	Number of owners	Number of firms held	Held value in trillion $	Covered ownership share
2002	22.77	20.31	89.19%	67,747	14,114	11.38	56.06%
2003	31.25	28.15	90.07%	74,230	14,911	16.13	57.30%
2004	36.68	33.00	89.97%	98,323	15,416	19.13	57.98%
2005	40.44	37.43	92.56%	121,917	16,890	22.43	59.93%
2006	49.99	45.88	91.78%	138,722	17,525	27.97	60.96%
2007	60.31	54.56	90.48%	156,399	18,493	35.65	65.34%
2008	32.27	29.68	91.99%	161,801	18,520	19.13	64.45%
2009	44.61	41.95	94.03%	166,615	18,737	27.52	65.61%
2010	51.47	48.19	93.63%	168,601	19,123	31.63	65.63%
2011	44.38	42.55	95.87%	173,552	19,269	28.11	66.06%
2012	51.13	48.49	94.83%	168,348	19,351	32.11	66.22%
2013	60.24	58.02	96.32%	168,506	19,516	39.27	67.67%
2014	63.43	60.58	95.50%	173,049	19,946	41.80	69.00%
2015	61.90	60.64	97.97%	182,984	20,334	41.73	68.82%
2016	65.00	62.53	96.21%	192,561	20,529	43.30	69.23%
2017	79.23	75.61	95.43%	195,506	20,497	52.82	69.86%
mean	49.69	46.72	93.49%	150,554	18,323	30.63	64.38%

Table 2: Summary Statistics

Panel A of this table shows summary statistics of market capitalization, returns as well as environmental, social, governance, and ESG scores. Return is the yearly stock return winsorized at the 1%-level, ESG scores are calculated as described in the text. Panel B shows the average percentage of covered ownership information (Ownership) by country for the full sample and the subsample of Asset4 ESG firms, ESG Scores, and its subscores are shown as averages. Panel C shows the same variables as in Panel B by industry. Appendix A describes the indicators used to calculate the environmental, social, and governance scores. The data are from the ASSET4 ESG, RDS, and ROP database.

Panel A: Summary statistics (pooled)

	Observations	Mean	Standard deviation	p1	Median	p99
Market capitalization	338,897	2,352,406	10,940,484	640	351,980	37,168,513
Return	333,863	9.58%	52.41%	-95.47%	3.40%	192.84%
ESG-score	51,966	37.33	10.79	15.98	36.07	61.87
E-score	51,966	20.28	12.88	5.71	16.43	53.57
S-score	51,966	41.34	12.97	17.95	39.74	71.15
G-score	51,966	49.75	14.31	14.08	52.11	74.65

Panel B: Summary statistics by country

	All firms		Asset4 ESG firms					
Country	Firms	Ownership	Firms	Ownership	E score	S score	G score	ESG score
Argentina	33	34.80%	16	33.81%	13.53	32.17	22.58	23.10
Australia	837	50.17%	478	47.27%	15.64	39.01	52.70	35.98
Austria	74	64.51%	21	58.57%	21.45	41.63	42.16	35.35
Bahrain	25	48.06%	7	56.39%	6.79	25.32	37.25	23.26
Belgium	130	54.87%	35	54.45%	20.92	42.28	47.64	37.19
Brazil	307	63.67%	102	67.59%	24.10	50.49	41.11	39.01
Canada	1,423	45.60%	405	55.34%	17.44	38.92	60.84	39.16
Chile	133	81.56%	41	81.50%	20.28	43.39	30.14	31.71
China	3,383	53.72%	279	64.99%	15.78	36.18	41.05	31.24
Czech Republic	15	73.00%	5	80.92%	21.19	45.63	45.51	37.78
Denmark	127	46.64%	33	47.19%	22.56	43.82	45.30	37.51
Egypt	77	53.08%	11	63.66%	10.84	36.10	28.17	25.45
Finland	122	60.38%	29	53.27%	30.95	47.21	53.06	43.91
France	520	64.28%	122	62.26%	30.76	52.19	52.49	45.44
Germany	587	56.22%	127	59.37%	27.61	49.75	44.19	40.87
Greece	155	41.46%	25	48.11%	18.71	41.13	33.61	31.52
Hong Kong	1,224	62.66%	205	70.26%	15.59	38.92	46.68	33.98
Hungary	19	55.62%	4	68.26%	30.62	58.26	56.07	48.72
India	1,005	62.02%	103	77.27%	24.95	46.81	47.52	40.05
Indonesia	254	59.83%	37	73.04%	20.61	47.23	41.19	36.76
Ireland	61	63.50%	18	61.70%	18.18	40.41	54.19	37.77
Israel	194	65.70%	18	49.60%	17.56	42.85	44.76	35.39
Italy	298	64.78%	73	55.93%	23.91	48.23	45.89	39.70
Japan	2,897	49.02%	461	46.28%	26.39	39.19	27.72	31.38
Kuwait	131	49.76%	10	36.17%	11.17	33.48	33.76	26.44
Malaysia	423	51.15%	55	80.40%	19.03	45.97	51.86	39.27
Mexico	147	40.90%	47	48.44%	20.80	43.74	36.84	34.17
Morocco	41	66.94%	3	80.54%	12.32	46.84	26.01	29.05
Netherlands	152	50.24%	51	50.75%	25.68	48.93	55.66	43.68
New Zealand	101	40.67%	59	44.04%	15.58	35.71	47.16	32.99
Norway	244	62.43%	32	62.58%	21.73	44.53	48.40	38.50
Oman	33	47.54%	10	61.84%	10.14	36.48	39.96	29.19
Pakistan	86	13.19%	5	65.71%	10.57	32.95	28.73	24.43
Papua New Guinea	3	71.77%	-	-	-	-	-	-
Philippines	127	52.29%	24	65.18%	18.90	44.38	48.25	37.49
Portugal	43	77.74%	13	76.31%	26.22	50.03	47.33	41.54
Qatar	43	31.57%	14	45.96%	7.68	31.14	29.66	23.16
Russian Federation	205	61.03%	38	61.53%	20.96	43.90	43.77	36.53
Singapore	435	61.93%	55	62.45%	16.10	38.56	47.19	34.18
South Africa	314	56.72%	142	66.65%	22.11	52.33	58.63	44.71
South Korea	1,065	50.38%	136	60.93%	27.16	47.13	30.75	35.43
Spain	189	60.92%	66	59.42%	27.62	53.04	48.55	43.46
Sweden	342	58.95%	74	59.35%	25.57	45.25	50.27	40.58
Switzerland	269	49.39%	82	48.92%	23.00	44.25	49.49	39.16
Taiwan	979	43.84%	146	50.49%	22.89	39.95	33.14	32.29
Thailand	249	48.74%	30	54.84%	22.13	46.69	52.46	40.71
Turkey	183	32.55%	30	71.58%	23.63	40.61	38.29	34.43
United Kingdom	1,450	74.63%	469	79.64%	22.07	45.71	56.92	41.79
United States	6,950	72.93%	2,843	87.20%	16.54	37.49	57.30	37.22
Vietnam	97	55.97%	-	-	-	-	-	-

Table 2 continued

Panel C: Summary statistics by industry

	All firms		Asset4 ESG firms					
Industry	Firms	Ownership	Firms	Ownership	E score	S score	G score	ESG score
Basic Materials	2,695	55.30%	674	63.08%	25.53	43.11	51.31	40.15
Cyclical Consumer G&S	3,883	63.48%	971	73.62%	20.06	40.27	48.57	36.50
Energy	1,580	58.66%	501	67.73%	20.76	41.32	54.23	38.93
Financials	4,749	56.37%	1540	65.63%	13.94	39.35	49.32	34.46
Healthcare	2,061	60.59%	637	73.54%	15.98	39.45	50.89	35.66
Industrials	4,236	59.32%	1,059	67.83%	23.90	42.37	48.08	38.32
n.a.	3,234	55.19%	141	68.63%	11.23	32.09	44.57	29.47
Non-Cyclical Consumer G&S	1,653	61.22%	447	68.40%	21.20	43.67	49.41	38.35
Technology	3,062	57.41%	669	72.53%	22.04	40.62	49.09	37.43
Telecommunications Services	388	60.58%	174	67.27%	18.08	46.12	50.27	38.50
Utilities	660	58.92%	276	63.43%	29.60	46.40	51.66	42.74
Total	28,201	58.78%	7,089	68.34%	20.28	41.34	49.75	37.33

Table 3: Portfolio characteristics by investor type

This table shows summary statistics of owner characteristics categorized by the Refinitiv's predefined typology. Owner characteristics are calculated as described in the text and shown as means and standard deviations (in brackets) within each owner type between 2002 and 2017.

Type of investor	N	E score	S score	G score	ESG score	Portfolio Value $Tsd.	# Holdings	Turnover	Return
		mean (standard deviation)							
Bank and Trust	6,962	27.78 (9.82)	47.43 (9.89)	54.62 (14.11)	43.48 (9.88)	1,446,999 (6,622,538.75)	164.83 (343.39)	10.15% (11.20%)	9.13% (25.72%)
Corporation	78,495	21.64 (12.79)	40.81 (11.86)	40.73 (15.02)	34.66 (10.65)	830,038 (4,481,494.02)	5.12 (33.34)	1.40% (4.68%)	9.69% (39.22%)
Endowment Fund	192	22.66 (11.70)	41.61 (10.23)	57.74 (9.10)	40.78 (9.46)	473,500 (1,188,864.13)	59.13 (165.32)	11.12% (14.94%)	9.10% (29.14%)
Foundation	307	25.62 (14.83)	44.98 (12.63)	54.92 (13.36)	42.02 (12.61)	595,404 (1,482,838.66)	33.31 (109.95)	4.30% (8.25%)	11.06% (33.88%)
Government/SWF	1,535	28.48 (12.51)	50.91 (13.19)	50.96 (12.96)	43.76 (11.10)	15,563,791 (45,283,209.22)	105.09 (684.15)	3.94% (6.97%)	10.07% (36.21%)
Hedge Fund	29,558	22.35 (8.88)	43.38 (9.15)	57.11 (8.80)	41.11 (7.67)	4,414,011 (35,601,596.42)	250.15 (684.36)	15.25% (13.87%)	10.00% (30.15%)
Holding Company	2,567	23.18 (12.29)	45.64 (13.24)	45.40 (13.79)	38.38 (11.16)	3,085,615 (6,213,982.21)	8.12 (46.42)	1.93% (5.40%)	12.18% (41.37%)
Individual Investor	479,858	19.65 (12.07)	41.95 (12.05)	56.19 (10.66)	39.44 (9.81)	35,686 (608,878.72)	1.28 (0.80)	0.69% (3.88%)	13.06% (41.20%)
Insurance Company	2,088	25.31 (11.24)	45.49 (10.69)	49.33 (14.09)	40.29 (10.08)	3,223,739 (11,040,276.48)	109.65 (365.51)	7.51% (8.77%)	10.08% (28.07%)
Investment Advisor (incl. Mutual Funds)	60,914	25.58 (9.49)	46.32 (9.38)	56.72 (10.64)	43.06 (8.67)	2,283,112 (23,523,133.44)	188.60 (462.45)	13.12% (11.81%)	10.15% (26.50%)
Others	5,338	21.67 (11.12)	42.88 (11.73)	51.07 (12.77)	38.76 (10.03)	2,571,006 (9,527,110.66)	155.97 (522.59)	5.54% (11.86%)	13.00% (39.77%)
Pension Fund	2,696	26.74 (9.19)	48.96 (9.39)	57.26 (10.25)	44.55 (8.42)	6,222,584 (19,681,654.78)	396.16 (913.82)	9.06% (9.61%)	10.11% (29.22%)
Private Equity	1,504	16.28 (10.91)	37.64 (11.31)	51.95 (9.85)	35.45 (8.95)	776,684 (1,578,389.12)	9.73 (18.36)	7.34% (11.79%)	11.48% (42.95%)
Venture Capital	727	14.68 (9.94)	35.23 (12.01)	50.88 (9.18)	33.74 (8.75)	431,783 (827,773.82)	14.57 (43.46)	8.51% (12.09%)	9.59% (43.96%)
All	672,741	20.71 (11.95)	42.40 (11.78)	54.33 (12.35)	39.34 (9.96)	643,179 (10,871,010.30)	34.79 (232.90)	3.03% (8.01%)	12.27% (10.63%)

Table 4: Ownership Characteristics

This table shows summary statistics on ownership characteristics and heterogeneity of 42,237 firm-years. Variables are defined as described in the text.

	Mean	Median	Standard deviation	p1	p99
Ownership E score	21.69	23.86	9.51	1.11	40.39
Ownership S score	37.81	42.66	14.46	2.14	60.17
Ownership G score	44.37	49.48	18.00	2.42	65.98
Ownership ESG score	34.78	39.04	13.53	1.91	52.32
Ownership E score Heterogeneity	6.20	5.52	3.04	1.41	13.54
Ownership S score Heterogeneity	8.27	5.86	5.75	1.51	21.05
Ownership G score Heterogeneity	9.47	7.36	6.80	1.64	23.89
Ownership ESG score Heterogeneity	7.45	5.35	5.23	1.18	18.97
Ownership # of Holdings	1,805.22	1,523.62	1,328.48	35.66	5,291.27
Ownership Turnover	11.12%	11.84%	5.76%	0.46%	24.10%
Ownership Return	7.17%	7.17%	17.60%	-43.29%	55.74%

Table 5: Ownership Characteristics and their relation to CSR

This table reports regression estimates of ESG scores on ownership characteristics and control variables with time and firm fixed effects. The sample consists of 42,237 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	(1) Firm E score	(2) Firm S score	(3) Firm G score	(4) ESG score
Ownership E score	0.106***			
	(0.014)			
Ownership S score		0.028***		
		(0.008)		
Ownership G score			0.062***	
			(0.008)	
Ownership ESG score				0.044***
				(0.008)
Ownership E score Heterogeneity	-0.388***			
	(0.059)			
Ownership S score Heterogeneity		-0.076		
		(0.055)		
Ownership G score Heterogeneity			-0.466***	
			(0.045)	
Ownership ESG score Heterogeneity				-0.554***
				(0.051)
Ownership Holdings	-0.118	0.290***	0.697***	0.250***
	(0.096)	(0.096)	(0.110)	(0.081)
Ownership Turnover	-5.969***	-1.802	-8.734***	-4.197***
	(1.416)	(1.363)	(1.405)	(1.111)
Ownership Return	-0.488**	-0.980***	-1.291***	-0.888***
	(0.208)	(0.197)	(0.220)	(0.165)
Tobin's Q	0.135*	0.035	-0.040	0.051
	(0.069)	(0.059)	(0.063)	(0.050)
Return	-0.426***	-0.606***	-0.630***	-0.533***
	(0.082)	(0.076)	(0.083)	(0.063)
Size	0.540***	0.783***	0.489***	0.613***
	(0.117)	(0.106)	(0.116)	(0.091)
Assets Tangibility	-0.541	0.095	0.025	-0.234
	(0.427)	(0.416)	(0.406)	(0.334)
Leverage	0.003	0.036	-0.013	0.010
	(0.046)	(0.043)	(0.041)	(0.036)
Constant	10.440***	22.250***	35.193***	23.970***
	(2.546)	(2.336)	(2.519)	(1.966)
Observations	42,237	42,237	42,237	42,237
Within R-squared	0.015	0.013	0.029	0.029
Adjusted R-squared	0.893	0.901	0.911	0.910

Table 6: Ownership Characteristics as a driver of CSR performance

This table reports regression estimates of first differenced ESG scores on first differenced ownership characteristics, control variables and time fixed effects following Anderson and Hsiao (1981). The sample consists of 30,451 firm-years (excluding incomplete and singleton observations). Standard errors are clustered at the firm level and are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	(1)	(2)	(3)	(4)
	Lead Firm E Score	Lead Firm S score	Lead Firm G score	Lead Firm ESG Score
Ownership E score	0.019**			
	(0.009)			
Ownership S score		0.009*		
		(0.005)		
Ownership G score			0.012**	
			(0.005)	
Ownership ESG score				0.016***
				(0.004)
Ownership E score Heterogeneity	-0.174***			
	(0.034)			
Ownership S score Heterogeneity		0.011		
		(0.034)		
Ownership G score Heterogeneity			-0.099***	
			(0.031)	
Ownership ESG score Heterogeneity				-0.212***
				(0.033)
Ownership Holdings	0.136**	0.274***	0.208**	0.245***
	(0.061)	(0.065)	(0.093)	(0.052)
Ownership Turnover	-1.364*	-0.899	-1.882**	-1.506***
	(0.724)	(0.826)	(0.915)	(0.556)
Ownership Return	-0.212	-0.301*	0.013	-0.248**
	(0.142)	(0.154)	(0.173)	(0.107)
Firm E score	-0.144*			
	(0.075)			
Firm S score		-0.036		
		(0.041)		
Firm G score			0.027	
			(0.035)	
Firm ESG score				-0.383***
				(0.061)
Tobin's Q	-0.003	0.087**	0.007	0.035
	(0.039)	(0.044)	(0.044)	(0.034)
Return	-0.113**	-0.047	-0.219***	-0.211***
	(0.057)	(0.061)	(0.063)	(0.047)
Size	0.273***	0.260***	0.359***	0.408***
	(0.070)	(0.076)	(0.078)	(0.064)
Assets Tangibility	-0.163	0.646***	0.242	0.109
	(0.215)	(0.239)	(0.265)	(0.176)
Leverage	-0.001	0.019	-0.024	-0.006
	(0.021)	(0.028)	(0.031)	(0.020)
Constant	1.307***	1.172***	0.906***	1.642***
	(0.107)	(0.070)	(0.059)	(0.096)
Observations	30,451	30,451	30,451	30,451
R-squared	0.108	0.013	0.132	0.296

Table 7: Granger Causality Tests

This table reports the results of Granger causality tests on the influence of ownership characteristics on CSR. In Columns (1) through (4) of Panel A, the dependent variables are the firms' future environmental, social, governance and ESG performance. In Columns (5) through (8), the dependent variables are the respective future ownership scores. Panel B reports the results of the same test pairwise for each of the remaining ownership characteristics. All tests are carried out as panel VAR including all ownership and firm controls as well as year fixed effects. Robust standard errors are reported in parentheses. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

Panel A: Ownership ESG-scores and firm ESG-scores

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Lead Firm E score	Lead Firm S score	Lead Firm G score	Lead Firm ESG score	Lead Ownership E score	Lead Ownership S score	Lead Ownership G score	Lead Ownership ESG score
Ownership E score	0.019**				0.511***			
	(0.009)				(0.131)			
Ownership S score		0.009*				0.509***		
		(0.005)				(0.131)		
Ownership G score			0.012**				0.493***	
			(0.005)				(0.137)	
Ownership ESG score				0.016***				0.505***
				(0.004)				(0.136)
Firm E score	-0.144*				-0.010			
	(0.075)				(0.007)			
Firm S score		-0.036				-0.003		
		(0.041)				(0.011)		
Firm G score			0.027				-0.007	
			(0.035)				(0.011)	
Firm ESG score				-0.383***				-0.008
				(0.061)				(0.014)
Ownership Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,451	30,451	30,451	30,451	30,451	30,451	30,451	30,451
R-squared	0.108	0.013	0.132	0.296	0.750	0.721	0.749	0.728

Panel B: Ownership characteristics and firm ESG score

	(1)		(2)		(3)		(4)	
	Lead Firm ESG score	Lead Ownership Heterogeneity	Lead Firm ESG score	Lead Ownership Holdings	Lead Firm ESG score	Lead Ownership Turnover	Lead Firm ESG score	Lead Ownership Return
Ownership ESG score	0.015***	-0.005***	0.015***	0.002	0.016***	-0.000***	0.016***	-0.000
	(0.004)	(0.002)	(0.004)	(0.008)	(0.004)	(0.000)	(0.005)	(0.000)
Ownership Heterogeneity	-0.210***	0.424***	-0.207***	-0.020	-0.210***	-0.000	-0.213***	0.004
	(0.032)	(0.119)	(0.032)	(0.020)	(0.032)	(0.000)	(0.033)	(0.003)
Ownership Holdings	0.267***	0.050	0.243***	-0.120	0.239***	-0.004***	0.247***	-0.015***
	(0.057)	(0.033)	(0.055)	(0.367)	(0.054)	(0.001)	(0.056)	(0.005)
Ownership Turnover	-1.527**	0.453**	-1.511**	0.280	-1.504**	0.153***	-1.582***	0.248***
	(0.594)	(0.186)	(0.593)	(0.673)	(0.593)	(0.034)	(0.598)	(0.058)
Ownership Return	-0.249**	-0.087***	-0.247**	-0.038	-0.246**	-0.000	-0.244**	0.081***
	(0.109)	(0.031)	(0.109)	(0.027)	(0.109)	(0.002)	(0.109)	(0.023)
Firm ESG score	-0.381***	0.003	-0.382***	0.000	-0.382***	0.000	-0.369***	-0.001**
	(0.061)	(0.002)	(0.061)	(0.001)	(0.061)	(0.000)	(0.061)	(0.000)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,442	30,442	30,468	30,468	30,468	30,468	29,951	29,951
R-squared	0.317	0.119	0.317	0.081	0.317	0.143	0.324	0.630

5 Article IV: The impact of corporate social responsibility on firm value – the role of shareholder preferences

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Abstract. This article shows that corporate social responsibility (CSR) is positively related to firm value, given firms have shareholders who reveal a corresponding preference for social or environmental performance, as proxied by their quantifiable investment habits. I suspect that this corresponds to an appreciation by socially responsible investors and is reflected in higher value for firms with a stronger CSR performance. In line with this conjecture, I find a premium of 4% in relation to the average firm value for higher environmental performance and 3.5% for higher social performance. The results are consistent with theoretical concepts arguing that CSR expenditures can be compatible with value maximization if it is a response to shareholder preferences.

JEL Classification: G11, G15, G23, G30, M14

Keywords: firm value, corporate social responsibility, shareholder preferences

5.1 Introduction

The issue of whether a firm should make a voluntary contribution to the sustainable development of our society has long been the subject of controversial debate in both management and finance literature. Given the context of these disciplines, the debate is less about the ethical or moral obligation of firms to assume social responsibility than about the impact on the original purpose of the firm. According to Friedman (1970), a business fulfills this purpose by focusing exclusively on maximizing shareholder value. Derived from this, a corporation's responsibility is limited to that of its shareholders.

The increasing integration of corporate social responsibility into business practices over the last 20 years thus seems to be a contradiction in terms. Similarly irritating are statements like a recent one by Larry Fink, CEO of the world's largest asset manager and thereby largest shareholder, in which he expressly sensitized corporate responsibility to environmental and social aspects (BlackRock, 2020). In order to reconcile these developments with the aforementioned Friedman doctrine on shareholder primacy, the question inevitably arises as to whether CSR also represents value for certain shareholders - in parallel to the value for the rest of society.

This article approaches an answer to this issue by respecting a corporation's shareholder preferences regarding environmental and social criteria. Despite much research on the direct link between CSR and firm value, no clear picture has yet emerged. Although the majority of empirical tests support theories that argue for a positive influence of CSR on firm value or profitability (see, e.g., Friede et al., 2015), a number of investigations also show the opposite (e.g., Marsat and Williams, 2011). Besides these ambiguous or even contradictory results on the CSR-value relationship, concerns are expressed regarding methodological aspects (Margolis and Walsh, 2017) or even to the theoretical foundation (Grewatsch and Kleindienst,

2017). However, with few exceptions[24], these studies have in common that they neglect those actors whose preferences are decisive for determining firm value, namely the shareholders.

In the light of the rapid increase in socially responsible investments worldwide[25] as well as the emergence of voluntary initiatives by institutional investors, such as the Portfolio Decarbonization Coalition (PDC) or the Principles of Responsible Investment (PRI), who are committed to integrating sustainability criteria in their investment decisions, the growing demand for responsible investment opportunities can hardly be ignored.

Several investigations suggest that environmental and social issues, such as climate-related transition (Goergen et al., 2020) or workforce diversity (Ellis and Keys, 2015), influence a firm's risk and return. Accordingly, the demand for responsible investment opportunities could be explained by the traditional objective function of portfolio management. Similarly, the growing awareness of sustainability in society as a whole and the resulting pressure on asset managers and policymakers to act in their principals' interests are also likely to be a driver of this demand. Nevertheless, the investors' rationale for incorporating sustainability criteria has not been fully clarified, but it seems certain that they do so (van Duuren et al., 2016).

Given the situation where the demand for eco-social responsibility is directed not (only) at the competent regulatory authorities, but also at the corporations, the latter would have an option worth considering to make corresponding offers. Following the theoretical modeling of Mackey et al. (2007), drawing this option could be tantamount to a firm value-enhancing strategy. If this is actually the case, the decision of corporate management to intensify efforts to achieve improved CSR would be in line with the postulate of maximizing shareholder value.

[24] See Buchanan et al., 2018 and Cao et al., 2019.
[25] According to the Global Sustainable Investment Alliance, sustainable investments increased by two thirds between 2014 and 2018 (GSIA, 2018).

In this context, Cao et al. (2019) reveal that stocks with a high proportion of socially responsible owners under react to quantitative mispricing signals. Consequently, one can conjecture that the shareholder value increased by CSR is less based on the expectation of an improved risk-return profile but more on a kind of appreciation by shareholders with appropriate investment preferences.

The central research question of this investigation is whether CSR activities are (more) value-enhancing if the respective firm is confronted with shareholders[26] who reveal a corresponding preference, and thereby demand, for environmentally or socially responsible investments. To avoid having to rely on blanket assumptions about the respective preferences of a firm's shareholders, I use the methodology developed by Benz et al. (2020) to quantify ownership preferences based on corporate owners' measurable investment habits.

As a prerequisite for this, I compile an extensive global sample, consisting of 6,845 firms and their corresponding 29,236 shareholders as wells as CSR information. During the observation period between 2002 and 2017, these identifiable shareholders cover about 68% of the ownership shares on an annual average.

To empirically substantiate shareholder preferences as a condition under which CSR expenditures affect firm value, I conduct several analyses. First, I divide firm-year observations into four subsamples depending on the level of CSR performance and shareholder CSR preferences. By comparing the average firm values across these subsamples, initial indications can be found that shareholders are prepared to reward both environmental and social performance if they have appropriate preferences.

[26] In this article the terms "owner" and "shareholder" are treated as synonyms and describe a single investor in a firm.

Second, to examine the moderating effect of shareholder preferences on the CSR-value relation, I estimate panel regressions with Tobin's Q as a function of CSR and an interaction term between the firm's CSR performance and the shareholder CSR preference. My results reveal a significant value-enhancing effect of a higher shareholder environmental preference on the per se positive impact of a firm's environmental performance. In comparison, my results indicate that an improvement in corporate social performance is only associated with higher firm value if there is a corresponding preference among shareholders.

The conducted tests include model specifications controlling for firm size, leverage, capital expenditures, profitability as well as firm and time fixed effects. Several robustness tests, including alternative measures of firm value, the use of ranked-based CSR performance, the different consideration of time-invariant effects, as well as other control variables, confirm the robustness of my results.

The remainder of the paper is structured as follows. In Section 5.2, I describe the construction of key variables and introduce the data used. Section 5.3 presents the empirical results regarding the influence of shareholder preferences on the relation between corporate environmental or social efforts and firm value. Section 5.4 contains the results of several further tests to evaluate the robustness of my findings. Section 5.5 concludes.

5.2 Data and construction of key variables

In this study, I use three major datasets: data on firms' environmental and social performance to measure CSR performance, data on corporate ownership to determine shareholder preferences and firm's financial or accounting data to compute firm value.

5.2.1 CSR performance

To measure CSR performance, I employ information from the ESG database provided by Refinitiv, Inc[27]. Refinitiv's analysts gather firm-specific information on ESG dimensions from a set of public sources (e.g., annual reports, NGO websites, and CSR reports) to assess a firm's CSR activities.

The data contains 70 environmental and 78 social performance indicators.[28] These indicators are answers to numerical, polar (Yes/No), or double polar questions with a positive or negative direction that reflect a firm's commitment to CSR-related topics (e.g., "Does the company show an initiative to reduce, recycle, substitute, phased out or compensate CO2 equivalents in the production process?" as a polar question with a positive direction within the environmental category).

I follow Dyck et al. (2019) and translate these indicators to indicator values: A numerical answer with positive (negative) direction is translated to 1 (0) if it is above the numeric threshold (median or zero), and to 0 (1) otherwise. Polar questions with positive (negative) direction are valued with 1 (0) if the answer is "Yes", and 0 (1) otherwise. Answers to double polar questions are evaluated following the same logic (i.e. for questions with a positive direction: 0 for "No/No", 0.5 for "Yes/No" or "No/Yes", and 1 for "Yes/Yes"). The sum of a

[27] The provider was established in 2018 through the acquisition of Thomson Reuters Group's Financial & Risk division (including its ASSET4 ESG database) by Blackstone Corp.
[28] In line with Servaes and Tamayo (2013), I do not consider the Corporate Governance (G) category as part of CSR.

firm's indicator values divided by the total number of indicators per category gives a plain environmental score (E-score) or social score (S-score):

$$score_{it} = \frac{1}{N}\sum_{n=1}^{N} I_{nit} \quad (1)$$

In Equation (1), $score_{it}$ refers to the respective E-score or S-score of a firm i in year t, N is the number of indicators and I_{nit} denotes the binary value of indicator n.

Refinitiv also offers pre-computed scores, these (ranked-based) scores are relative to peer firms' scores evaluated in the year under review. In contrast to the raw scores calculated here, firm-specific variability in CSR performance can thus not be observed independently of other firms' changes in CSR performance.[29] As Refinitiv's ESG indicators are available from 2002, this defines the start of my observation period.

5.2.2 Shareholder CSR preferences

I gather data on firms' shareholders from the Refinitiv Ownership and Profiles database. Refinitiv captures the majority of publicly listed firms worldwide and gets its data on corporate owners from sources such as SEC filings, share registers, mutual fund portfolios, directors' and insiders' disclosures, and declarable stakes notifications. The database provides the number of held shares and the respective market value of each shareholder's positions in the individual firms at each year-end.

In order to determine the CSR preferences of each investor and to aggregate these at the firm-level as the CSR preferences of shareholders, I follow the methodological approach of Benz et al. (2020). Accordingly, I first use the reported held value of each shareholder's positions to

[29] This avoids, for example, the misinterpreted statement that a firm has increased its CSR efforts when in fact these have remained unchanged and only the CSR scores of peer firms have worsened. Nevertheless, my results are robust even when using Refinitiv's ranked-based scores.

calculate portfolio holding weights and thus create a panel of the investors' equity portfolios. In a second step, I determine the CSR preference of an investor ($investor\ preference_{jt}$) quantitatively based on the selected holdings and corresponding weightings within her portfolio:

$$investor\ preference_{jt} = \sum_{i=1}^{N^{jt}} w_{jit}\ score_{it} \tag{2}$$

As defined in Equation (1) $score_{it}$ is either the E-score or S-score of holding firm i at each year-end t and w_{jit} is the corresponding holding weight in investor portfolio j.

To avoid a situation where the shareholders' CSR preference is determined exclusively by a single firm[30], I follow the literature and adjust Equation (2) to calculate the investor preference individually for each firm s based on all other holdings i of the respective investor portfolio j in year t:

$$investor\ preference\ adj_{jst} = investor\ preference_{jt} - \frac{w_{jst}\ ((\sum_{i=1}^{N^j} w_{jit}\ score_{it}) - score_{st}))}{w_{jst} - 1} \tag{3}$$

Finally, I aggregate the investors' preferences for each firm to define shareholders' preferences:

$$shareholder\ preference_{st} = \sum_{j=1}^{N^s} \frac{heldshares_{jst}}{\sum_j^{J^s} heldshares_{jst}}\ investor\ preference\ adj_{jst} \tag{4}$$

where $heldshares_{jst}$ is the number of shares held by investor j in firm s at each year-end. The preferences of an investor with a high (low) ownership share thus are given a congruently higher

[30] Such a situation arises when a firm is wholly owned by a single shareholder and that shareholder is invested exclusively in that firm.

(lower) weighting among all shareholders of a firm. Therefore, $shareholder\ preference_{st}$ reflects the aggregated environmental or social preference of all corporate owners.

5.2.3 Firm value

To evaluate a firm's value, I use Tobin's Q, which is defined as the ratio between a firm's market value and the replacement costs of assets. For this purpose, I obtain the required accounting data from Datastream and Worldscope and follow Chung and Pruitt (1994) to calculate an approximation of Tobin's Q, defined as:

$$Tobin's\ q_{st} = \frac{market\ value_{st} + preferred\ stock\ value_{st} + debt_{st}}{total\ assets_{st}} \quad (5)$$

where $market\ value_{st}$ is the product of a firm's share price and the number of common shares outstanding, $preferred\ stock\ value_{st}$ represents the liquidating value of outstanding preferred stocks, $debt_{st}$ is the value of the firm's short-term liabilities net of its short-term assets, plus the book value of the firm's long-term debt, and $total\ assets_{st}$ denotes the book value of total assets.

In reduced terms, Tobin's Q represents the relationship between the market value, i.e. the price at which shareholders are willing to pay for the firm, and the firm's substantial value. Accordingly, a Tobin's Q unequal to one can be explained by current shareholders' expectations regarding the future development of the firm or "values" that do not appear materially in the books. An improvement in CSR performance could, therefore, be reflected simultaneously, e.g., as a current expense in the book values (denominator) and as a net present value (or shareholder appreciation) in the market value (numerator) - Tobin's Q is thus capable of representing the cost-benefit relation of a CSR activity from a shareholders' perspective.

5.2.4 Sample summary

Panel A of Table 1 contains descriptive statistics on the defined key variables and other firm characteristics. The sample consists of 6,845 firms (50,652 firm years), spread over 48 countries worldwide, and covering all economic sectors[31]. During the investigation period from 2012 to 2017, I observe an average E-score of 0.20 and an average S-score of 0.42, respectively, with a perfect score of 1.

With an average ownership coverage[32] of 68.42%, I am able to represent the majority of firms' shareholders. An average firm is faced with shareholders whose environmental (social) preference has a mean of 0.21 (0.38).

It is noticeable that the average E- and S-score is unequal to the corresponding average shareholder preference. The reasons for this can be traced back to the adjustment carried out in Equation (3) on the one hand and to the incomplete coverage with owner information on the other. With a median of 1.06, Tobin's Q reveals a roughly balanced relationship between a firm's market value and replacement costs, on average I observe a Q of 1.49.

[Insert Table 1 here.]

I report the averages of firms' environmental and social performance and the corresponding preferences of their shareholders by country in Panel B of Table 1. Noteworthy is the strong environmental and social performance of firms based in Finland (rank 1 in each case), with their shareholders having the highest E-preference and one of the highest S-preferences. In contrast, firms based in Bahrain have the weakest environmental and social performance and at the same time face shareholders who reveal a low preference for these criteria.

[31] As definied by Refinitiv's Thomson Reuters Business Classification (TRBC).
[32] Defined as the aggregated number of shares per firm held by all investors in the sample divided by the number of common shares outstanding.

About one-third of the sample is represented by firms based in the USA. Thereby, US firms show below-average E- and S-scores, but at the same time a considerably above-average shareholder E- and S-preference.

5.3 Empirical Results

In this section, I examine the main hypothesis, which is that shareholders' E-/S-preferences, as proxied by a firm's investors' share-weighted portfolio E-/S-scores, enhance the impact of CSR on the value of firms. As I have reasoned before, socially responsible investors appreciate the CSR activities of firms and, in parallel, compete for sustainable investment opportunities. This investor behavior may be reflected in a CSR premium.

5.3.1 The CSR premium

Since I am interested in the effect of CSR efforts on firm value and especially in the potentially differing influence on firm value depending on the CSR preference of the firm's shareholders, I group the observed firm-years in subsamples. Hereby, I sort firms by their CSR performance (E- or S-score) and classify them as firms with a high or low CSR performance depending on whether they are above or below the corresponding median. In parallel, I split the sample of firms according to the CSR preferences of their shareholders in firms with high or low shareholder CSR preferences also using the median as a threshold.

[Insert Table 2 here.]

Based on these classifications, four subgroups result, whose mean Qs are shown in Panel A (E-score) and B (S-score) of Table 2. The first column of Panel A reveals that firms with a low E-score and a low shareholder E-preference are valued with a mean Q of 1.75, which corresponds to 118% of the group-independent mean Q (1.49). Compared to the Q of the subset of firms

with a high E-score but still a low shareholder E-preference of 1.36 (91%), this suggests that high environmental performance is associated with 0.39 (26 pp) lower firm value for firms with low shareholder E-preferences.

The second column discloses a similar but not identical pattern for firms with a high shareholder E-preference. Again, a high E-score is associated with a lower Q, but the loss in firm value of 0.28 (19 pp) is substantially lower than for firms with a low shareholder E-preference. In this univariate analysis, the mitigating effect due to the E-preference of shareholders, referred to as E-premium, can be quantified at 0.11 (0.39 - 0.28) or 7 pp.

Considering the same analysis concerning social performance in Panel B of Table 2, a generally lower Tobin's Q is revealed for firms with a high S-score compared to low S-score firms. However, a dampening effect (S-premium) of 0.06 (4 pp) in value-reduction for firms with a high shareholder S-preference is also apparent here.

5.3.2 Shareholder preferences and value of CSR activities

To further examine the moderating effect of shareholder preferences on the CSR-value relation, I estimate panel regressions with Tobin's Q as a function of CSR and an interaction term between the firm's CSR measure and the corresponding shareholder preference for environmental or social performance ($shareholder\ preference_{st}$):

$$Tobin's\ Q_{st} = \alpha + \beta_1 CSR_{st} + \beta_2 shareholder\ preference_{st} + \beta_3 (CSR_{st}\ x\ shareholder\ preference_{st}) + \eta' controls_{st} + \lambda + \tau + \varepsilon_{st} \quad (6)$$

Following prior investigations, the model specifications for estimating Tobin's Q include firm size, leverage, capital expenditures, and profitability as control variables ($controls_{st}$). I measure firm size as the natural logarithm of the book value of assets. According to Durnev and Kim (2005), larger firms are more visible to the public and therefore tend to be under greater

scrutiny. Consequently, larger firms may undertake more CSR efforts to promote positive public perception. I control for a firm's leverage, as the ratio of total liabilities to assets, to take into account the potentially improved monitoring of management by creditors and the resulting reduction in agency costs (see, e.g. Harvey et al., 2004). Further, I follow Lins (2003) and control for investment opportunities by including the ratio of capital expenditures to assets. To measure profitability, I divide a firm's net income prior to financing costs by its total assets (ROA).

I apply two measures of CSR: the environmental score, which includes three Refinitiv categories (emission reduction, product innovation, and resource reduction), and the social score, which includes four Refinitiv categories (workforce, human rights, community, and product responsibility). For each measure of CSR, I conduct five model specifications that vary in the consideration of controls as well as firm (λ) and time fixed effects (τ). The use of firm fixed effects to control for time-invariant and unobserved firm-level characteristics is a more conservative specification than controlling for time-invariant industry or regional effects. I thereby follow the argumentation of Servaes and Tamayo (2013), who assume that the omission of firm fixed effects is a major reason for the contradictory results of previous studies regarding the influence of CSR on firm value. All regression models are performed using ordinary least squares (OLS) and standard errors (ε_{st}) are adjusted for heteroscedasticity (White, 1980).

[Insert Table 3 here.]

The results regarding the environmental category are reported in Panel A of Table 3. Except for model (5), it is striking that the firm's environmental efforts per se have a negative (models (1) and (2)) or statistically insignificant impact (models (3) and (4)) on value. On the other hand, the coefficient of interest regarding the interaction between a firm's environmental efforts and the corresponding preference of its shareholders reveals a positive and, at the 1% level,

significant influence on Tobin's Q in all specifications. Accordingly, firms benefit from a stronger environmental performance when they are owned by shareholders who share this preference - and thereby value these efforts.

A similar picture emerges when considering the second CSR category, the firm's social performance, in Panel B of Table 3. Again, all specifications show that greater social efforts by firms are associated with lower firm value. So here, too, it can be concluded that a firm's social efforts only add value if they are appreciated by their owners.

The effect of shareholder preferences on the relationship between CSR and firm value is also economically significant. For example, based on model (5) in Panel A of Table 3, for firms with a shareholder environmental preference of zero, an increase in the environmental score by one standard deviation (0.131) results in an increase in Tobin's Q of 0.035. For firms with an average shareholder environmental preference of 0.215, the same increase in environmental score results in an increase in firm value of 0.059. In relation to the average Tobin's Q, this corresponds to a premium of 4.0%.

This economic impact becomes even more apparent when considering the social score based on model (5) in Panel B of Table 3. While firms with an increase in the social score by a standard deviation of 0.129 and zero corresponding shareholder preference suffer a reduction in firm value of 0.022, firms with an average shareholder social preference of 0.375 experience an increase in value of 0.052 or 3.5% in relation to the average Tobin's Q.

[Insert Figure 1 here.]

Based on the linear predictions of model specification (5), I depict the interactions graphically. Figure 1 reveals that firms with high shareholder E-preference benefit considerably more from an improvement in environmental performance than firms with low shareholder E-preference.

[Insert Figure 2 here.]

Analogously, Figure 2 shows the interaction regarding a firm's social performance. Here, the moderating effect of shareholder preferences becomes even more apparent: While firms with low social performance and a correspondingly low shareholder preference reveal a higher estimated Tobin's Q compared to firms with a high shareholder preference, this relation reverses with increasing social performance.

5.4 Robustness Analysis

In this section, I report the results of several additional tests that were conducted to assess whether my results are robust.

5.4.1 Firm value alternatives

In the main analysis, I used Tobin's Q following the Chung and Pruitt (1994) approximation as a measure of firm value. Since Perfect and Wiles (1994) have shown that estimation results are sensitive to the definition of firm value, I verify the robustness of my estimates to different measures of value and construct three alternatives: (1) a simple market to book ratio, (2) the annual stock return, and (3) an industry-adjusted Q - to also address concerns about potential industry effects.

[Insert Table 4 here.]

Table 4, Panel A, presents the results of the regressions with each firm value alternative as a function of E-score and the interaction term between E-score and shareholder E-preference. The coefficients of the interaction term remain positive for all specifications, significant at the 1% level. Also, the overall effect, i.e. the sum of the coefficients for E-score, shareholder E-

preference, and their interaction, remains positive concerning all alternative firm values. Accordingly, my main findings are robust irrespective of the definition of firm value.

Panel B of Table 4 reaffirms the robustness against the definition of value also for the social category. Merely column (2) shows the interaction term's positive influence on the annual stock return with a slightly lower statistical significance, and a negative overall effect. It should be noted, however, that equity returns are less an alternative to than a driver of Q.

5.4.2 Ranked-based CSR measurement

As described in Section 5.2, I use peer-independent "raw" E- and S-scores as proxies for CSR performance and as the basis for the quantification of corresponding shareholder preferences. A potential objection could, therefore, be that the "true" CSR performance can only be evaluated in relation to benchmark firms, as done by Refinitiv. It could also be argued that if CSR criteria are relevant in portfolio decisions, investors do not calculate their own "raw" E- and S-scores, but rather rely on those already prepared by Refinitiv. Accordingly, their preferences would also be based on these rank-based scores.

[Insert Table 5 here.]

To counter this criticism, I review my findings using the ranked-based E- and S-scores provided by Refinitiv. Table 5 discloses the results of these tests, which from an econometric perspective indicate that the choice between rank-based and raw scores is irrelevant: For both the environmental and social categories, the coefficient of interaction between CSR measure and shareholder preference reveals a positive and significant impact on Tobin's Q. Similarly, the overall effect of a positive change in the respective CSR measure on firm value is positive.

5.4.3 Control variables

As already stated by Servaes and Tamayo (2013), the use of the book value of assets as a control variable for firm size may distort regression estimates, as the book value is also used in the calculation of the dependent variable, Tobin's Q. In order to verify the inferences based on my estimates, in a further test I choose the logarithm of sales instead of the logarithm of total assets as a proxy for firm size. The results of this test are reported in Panel A (E-score) and Panel B (S-score) of Table 6. As model (1) in each Panel shows, my findings are not affected.

[Insert Table 6 here.]

Lastly, in the final set of robustness checks, I vary the controls for time-invariant effects and substitute the originally used firms fixed effects by country and industry (6-digit TRBC) fixed effects. Table 6, models (2) to (4), report the results of these tests. The impact of the CSR-shareholder preference interaction on value remains positive and significant for both, the environmental (Panel A) and social (Panel B) dimension.

5.5 Conclusion

Bearing in mind that ultimately the shareholders, through the purchase or sale of shares, are the decisive authority in setting the price or firm value, it is obvious that they also have an influence on the value assessment of a firm’s engagement in CSR. To the best of my knowledge, this article presents the first empirical evidence of this implication. Thereby, I reveal that CSR activities enhance firm value for firms that are confronted with CSR-affine shareholders. In particular, I find that by improving their environmental performance, firms can increase their value by 4.0% in relation to the average Tobin's Q, given a corresponding preference of their

shareholders. Similarly, I find that an improvement in social performance with a corresponding preference of shareholders is associated with a 3.5% higher firm value.

My results on the value-enhancing effect of CSR actions in consideration of a corresponding shareholder demand are consistent with the theoretical work of Mackey et al. (2007), in which CSR is seen as a "product" that firms offer to investors who are willing to pay for it. Furthermore, my findings coincide with related approaches that empirically investigate the influence of shareholders on the value of corporate sustainability activities (e.g., Buchanan et al., 2018, Cao et al., 2019).

This article does not clarify whether the shareholder's appreciation of CSR activities is based on their expectation of maximizing prospective profits following the "doing well, by doing good" hypothesis (see, Bãnabou and Tirole, 2010) or whether corporate responsibility in itself represents a value for shareholder (Hart and Zingales, 2017, among others).

Nevertheless, my results have important implications for corporate management. The decision as to whether the firm is to make CSR efforts or not should be made in the light of firm-specific shareholder preferences, provided that the objective of maximizing shareholder value is thereby pursued. On the other hand, this shareholder primacy also implies a social responsibility of investors, whose corresponding efforts should also be made visible through their actual investment behavior to support corporate management's decision making

My work suggests several fields for further research. The significance of shareholder preferences for the value of corporate actions may not be limited to CSR policy, but probably plays an important role in many areas of corporate decision making (e.g., about corporate governance). In analogy to the suggestion by Benz et al. (2020), I think that in the context of empirical verification of the effects of corporate decisions on firm value, the consideration of

quantifiable owner or shareholder preferences is a decisive influencing factor. This investigation could serve as the first inspiration.

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Figures and Tables

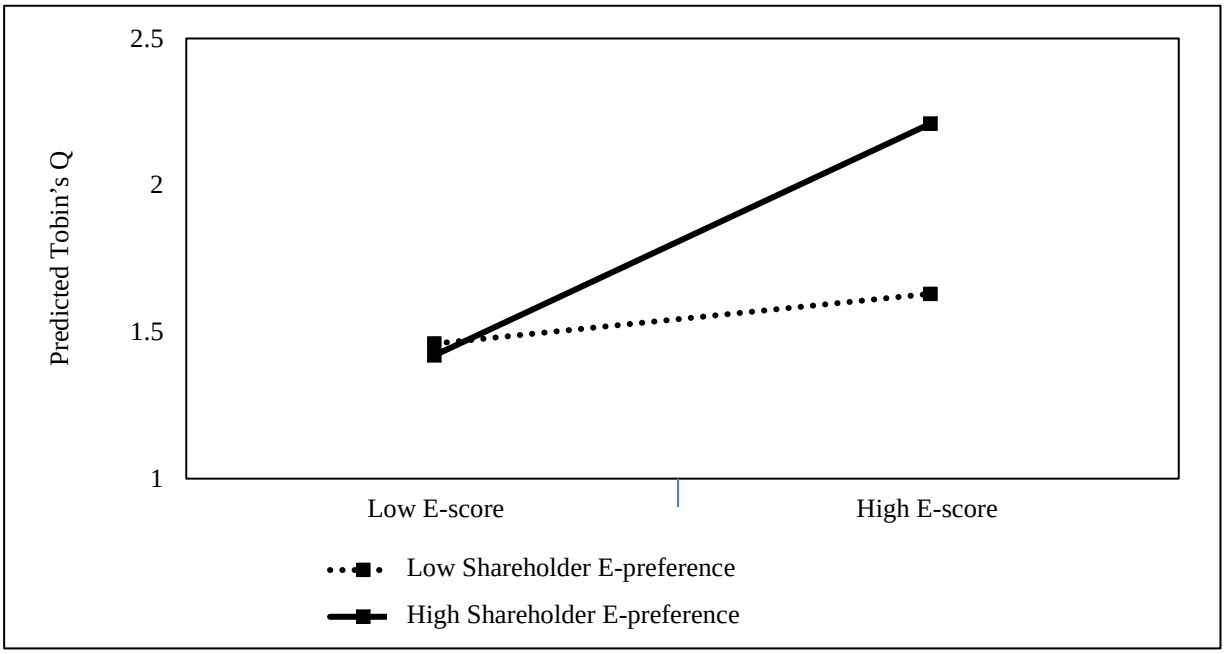

Figure 1: Interaction between E-score and Shareholder E-preference

The diagram shows the prediction of Tobin's Q (y-axis) as a function of corporate environmental performance (x-axis) according to Equation (6) / model (5). Low E-score corresponds to the minimum E-score of 0.03, High E-score to the maximum of 0.65, Low Shareholder E-preference is the minimum Shareholder E-preference of 0.00 and High Shareholder E-preference is the maximum of 0.53 (see Table 1).

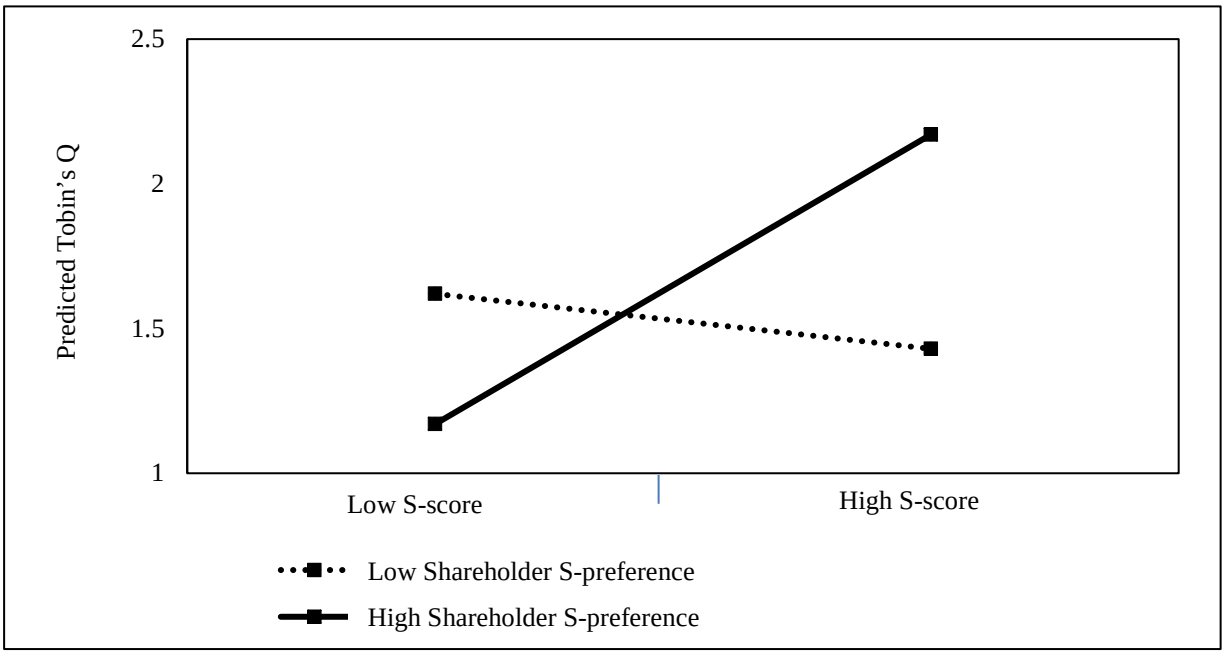

Figure 2: Interaction between S-score and Shareholder S-preference

The diagram shows the prediction of Tobin's Q (y-axis) as a function of corporate social performance (x-axis) according to Equation (6) / model (5). Low S-score corresponds to the minimum S-score of 0.13, High S-score to the maximum of 0.81, Low Shareholder S-preference is the minimum Shareholder S-preference of 0.00 and High Shareholder S-preference is the maximum of 0.73 (see Table 1).

Table 1: Summary Statistics

Panel A of this table shows summary statistics for firm characteristics relating to 6,845 distinct firms in the observation period between 2002 and 2017. Tobin's Q, total assets, capital expenditures, and return on assets are winsorized at the 1% level. Panel B shows the means of Tobin's Q, E-score, S-score as well as shareholder E- and S-preferences by country.

Panel A: Summary statistics

Variable	N	Mean	Median	Standard deviation	Min	Max
Tobin's Q	50,652	1.49	1.06	1.50	0.09	13.85
E-score	50,652	0.20	0.16	0.13	0.03	0.65
S-score	50,652	0.42	0.40	0.13	0.13	0.81
Shareholder E-preference	50,652	0.21	0.24	0.09	0.00	0.53
Shareholder S-preference	50,652	0.38	0.42	0.14	0.00	0.73
Total assets ($ millions)	50,447	36,000	5,126	161,000	42	3,780,000
Leverage	49,485	1.15	0.59	1.84	0.00	12.09
Capital expenditures	45,041	0.17	0.05	0.44	0.00	3.98
Return on assets	49,988	0.05	0.05	0.11	-0.88	0.35

Table 1 continued:

Panel B: Means by country

Country	N	Tobin's Q	E-score	Shareholder E-preference	S-score	Shareholder S-preference
Argentina	32	2.01	0.14	0.11	0.32	0.22
Australia	3,149	1.79	0.16	0.16	0.39	0.31
Austria	233	0.91	0.22	0.15	0.42	0.27
Bahrain	14	0.75	0.07	0.05	0.24	0.19
Belgium	395	1.09	0.21	0.17	0.42	0.30
Brazil	725	1.44	0.24	0.19	0.51	0.34
Canada	3,112	1.34	0.17	0.23	0.39	0.41
Chile	216	1.14	0.20	0.13	0.43	0.22
China	956	1.21	0.16	0.11	0.36	0.23
Czech Republic	42	0.97	0.21	0.14	0.46	0.28
Denmark	352	2.27	0.23	0.20	0.44	0.35
Egypt	88	0.70	0.11	0.11	0.36	0.24
Finland	373	1.29	0.31	0.27	0.47	0.43
France	1,352	1.10	0.31	0.22	0.52	0.36
Germany	1,170	1.17	0.28	0.21	0.50	0.35
Greece	289	0.96	0.19	0.16	0.41	0.31
Hong Kong	1,626	1.42	0.16	0.11	0.39	0.21
Hungary	37	0.72	0.31	0.20	0.58	0.34
India	722	2.40	0.25	0.21	0.47	0.35
Indonesia	260	2.49	0.21	0.11	0.47	0.25
Ireland	175	1.29	0.19	0.21	0.40	0.37
Israel	133	1.23	0.18	0.11	0.43	0.21
Italy	697	0.87	0.24	0.21	0.48	0.36
Japan	5,346	1.08	0.27	0.26	0.39	0.39
Kuwait	46	0.81	0.12	0.17	0.34	0.28
Malaysia	393	1.71	0.19	0.18	0.46	0.37
Mexico	292	1.65	0.21	0.16	0.44	0.29
Morocco	29	1.22	0.12	0.05	0.47	0.13
Netherlands	426	1.11	0.27	0.24	0.50	0.41
New Zealand	264	1.73	0.16	0.15	0.36	0.30
Norway	316	1.16	0.22	0.22	0.45	0.38
Oman	35	0.56	0.10	0.08	0.36	0.21
Pakistan	5	0.68	0.11	0.05	0.33	0.08
Philippines	175	1.23	0.19	0.14	0.44	0.27
Portugal	153	0.98	0.26	0.18	0.50	0.32
Qatar	66	1.05	0.08	0.16	0.31	0.36
Russian Federation	324	1.08	0.21	0.11	0.44	0.19
Singapore	601	1.18	0.16	0.16	0.39	0.35
South Africa	906	1.42	0.22	0.20	0.53	0.40
South Korea	923	1.14	0.27	0.23	0.47	0.36
Spain	645	1.28	0.28	0.18	0.54	0.33
Sweden	744	1.44	0.26	0.25	0.45	0.42
Switzerland	844	1.74	0.23	0.21	0.44	0.35
Taiwan	1,085	1.22	0.23	0.17	0.40	0.30
Thailand	188	1.70	0.22	0.15	0.47	0.27
Turkey	227	1.12	0.24	0.12	0.41	0.20
United Kingdom	4,367	1.51	0.22	0.24	0.46	0.43
United States	16,104	1.75	0.17	0.24	0.38	0.43

Table 2: Comparison of Qs by CSR level: high versus low shareholder CSR preferences

This table shows the average Tobin's Q for each of four firm-year subgroups classified by CSR performance and the shareholder CSR preferences with the respective median as a threshold. Panel A shows these sorts for the environmental category and Panel B for the social category. Significance levels for differences in means are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

Panel A: E-score

	Shareholder E-preference			
	(1)	(2)	(3)	(4) = (2) – (1)
E-score	Low	High	All	High-Low
Low	1.75	1.54	1.68	-0.21***
	(118%)	(104%)	(113%)	(-14pp)
High	1.36	1.26	1.30	-0.10***
	(91%)	(84%)	(87%)	(-10pp)
All	1.61	1.37	1.49	-0.33***
	(108%)	(92%)	(100%)	(-33pp)
High-Low	-0.39***	-0.28***	-0.38***	**0.11**
	(-26pp)	(-19pp)	**(**-26pp)	**(7pp)**

Panel B: S-score

	Shareholder S-preference			
	(1)	(2)	(3)	(4) = (2) – (1)
S-score	Low	High	All	High-Low
Low	1.70	1.41	1.63	-0.29***
	(114%)	(95%)	(109%)	(-19pp)
High	1.53	1.30	1.34	-0.23***
	(103%)	(87%)	(90%)	(-15pp)
All	1.59	1.38	1.49	-0.21***
	(107%)	(93%)	(100%)	(-14pp)
High-Low	0.17***	0.11***	0.29***	**0.06**
	(-11pp)	(-7pp)	(-19pp)	**(4pp)**

Table 3: Panel Regression of Firm Value as a Function of CSR Involvement, and the Interaction of CSR and Shareholders' Preferences

This table shows regression estimates for Tobin's Q as a function of CSR and an interaction term between the firm's CSR measure and the corresponding shareholder preference for environmental performance in Panel A or social performance in Panel B. In each Panel, model (1) includes neither controls nor fixed effects, model (2) includes controls, as described in the text, but no fixed effects, models (3) to (4) include both, controls and combinations of firm and/or time fixed effects. Robust standard errors are reported in brackets. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

Panel A: E-score

Dependent: Tobin's Q	(1)	(2)	(3)	(4)	(5)
E-score	-2.280***	-0.400**	-0.182	-0.145	0.266*
	(0.188)	(0.160)	(0.129)	(0.163)	(0.150)
Shareholder E-preference	-1.593***	-0.906***	-1.016***	-0.576***	-0.137
	(0.184)	(0.162)	(0.156)	(0.169)	(0.189)
E-score # Shareholder E-preference	2.667***	2.134***	2.574***	1.649***	1.887***
	(0.677)	(0.587)	(0.439)	(0.596)	(0.452)
Firm Size		-0.371***	-0.551***	-0.374***	-0.603***
		(0.008)	(0.025)	(0.008)	(0.026)
Leverage		-0.007*	0.011***	-0.007*	0.015***
		(0.004)	(0.004)	(0.004)	(0.004)
Capital Expenditures		0.020	0.141***	0.035	0.151***
		(0.026)	(0.032)	(0.026)	(0.032)
Return on Assets		3.969***	2.503***	4.008***	2.381***
		(0.195)	(0.121)	(0.196)	(0.122)
Constant	2.283***	7.223***	9.979***	7.163***	10.516***
	(0.045)	(0.127)	(0.380)	(0.127)	(0.393)
Firm Fixed Effects	no	no	yes	no	yes
Year Fixed Effects	no	no	no	yes	yes
Observations	43,665	43,665	42,965	43,665	42,965
Adjusted R-squared	0.032	0.204	0.756	0.216	0.768

Table 3 continued:

Panel B: S-score

Dependent: Tobin‘s Q	(1)	(2)	(3)	(4)	(5)
S-score	-1.666***	-0.544***	-0.736***	-0.216	-0.285
	(0.198)	(0.169)	(0.155)	(0.172)	(0.177)
Shareholder S-preference	-1.421***	-1.152***	-1.314***	-0.957***	-0.921***
	(0.213)	(0.190)	(0.190)	(0.192)	(0.199)
S-score # Shareholder S-preference	1.791***	2.236***	2.760***	1.963***	2.398***
	(0.456)	(0.404)	(0.378)	(0.407)	(0.381)
Firm Size		-0.380***	-0.562***	-0.383***	-0.600***
		(0.007)	(0.025)	(0.007)	(0.026)
Leverage		-0.005	0.011***	-0.006	0.015***
		(0.004)	(0.004)	(0.004)	(0.004)
Capital Expenditures		0.025	0.140***	0.040	0.150***
		(0.026)	(0.032)	(0.026)	(0.032)
Return on Assets		3.953***	2.495***	3.962***	2.369***
		(0.194)	(0.121)	(0.196)	(0.122)
Constant	2.529***	7.495***	10.375***	7.373***	10.682***
	(0.089)	(0.145)	(0.382)	(0.145)	(0.405)
Firm Fixed Effects	no	no	yes	no	yes
Year Fixed Effects	no	no	no	yes	yes
Observations	43,665	43,665	42,965	43,665	42,965
Adjusted R-squared	0.015	0.204	0.757	0.217	0.768

Table 4: Alternative measures for firm value

This table shows regression estimates for various firm value definitions as a function of CSR and an interaction term between the firm's CSR measure and the corresponding shareholder preference for environmental performance in Panel A or social performance in Panel B. Robust standard errors are reported in brackets. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

Panel A: E-score

	(1)	(2)	(3)
	Market to Book Ratio	Stock Return	Industry-adjusted Q
E-score	0.494	-0.249***	0.051
	(0.412)	(0.079)	(0.160)
Shareholder E-preference	-0.090	-0.315***	-0.489**
	(0.486)	(0.086)	(0.204)
E-score # Shareholder E-preference	4.549***	0.626***	2.539***
	(1.280)	(0.239)	(0.486)
Controls	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
Year Fixed Effects	yes	yes	yes
Observations	42,405	42,795	42,965
Adjusted R-squared	0.702	0.289	0.400

Panel B: S-score

	(1)	(2)	(3)
	Market to Book Ratio	Stock Return	Industry-adjusted Q
S-score	-0.927**	-0.313***	0.054
	(0.457)	(0.084)	(0.177)
Shareholder S-preference	-1.763***	-0.280***	-0.457**
	(0.480)	(0.083)	(0.186)
S-score # Shareholder S-preference	5.215***	0.349**	1.103***
	(0.945)	(0.166)	(0.355)
Controls	yes	yes	yes
Firm Fixed Effects	yes	yes	yes
Year Fixed Effects	yes	yes	yes
Observations	42,405	42,795	42,965
Adjusted R-squared	0.702	0.289	0.399

Table 5: Rank-based CSR scores

This table shows regression estimates for Tobin's Q as a function of CSR and an interaction term between the firm's ranked-based CSR measure, as provided by Refinitiv, and the corresponding shareholder preference for environmental performance in model (1) or social performance in model (2). Robust standard errors are reported in brackets. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

	(1)	(2)
Dependent: Tobin's Q	Refinitiv E-Score	Refinitiv S-Score
Score	-0.272***	-0.338***
	(0.059)	(0.067)
Shareholder Preference	-0.279***	-0.397***
	(0.080)	(0.086)
Score # Shareholder Preference	0.621***	0.830***
	(0.101)	(0.113)
Controls	yes	yes
Firm Fixed Effects	yes	yes
Year Fixed Effects	yes	yes
Observations	42,726	42,726
Adjusted R-squared	0.767	0.767

Table 6: Robustness to Controls and Fixed Effects

This table shows regression estimates for Tobin's Q as a function of CSR and an interaction term between the firm's CSR measure and the corresponding shareholder preference for environmental performance in Panel A or social performance in Panel B. In each Panel, Model (1) includes log. sales to control for firm size, model (2) includes controls, as described in the text as well as country and year fixed effects, model (3) includes controls as well as industry and year fixed effects, model (4) includes controls as well as country, industry and year fixed effects. Robust standard errors are reported in brackets. Significance levels are denoted by asterisk (*** p<0.01, ** p<0.05, * p<0.1).

Panel A: E-score

Dependent: Tobin's Q	(1)	(2)	(3)	(4)
E-score	-0.337**	-0.014	0.398**	0.824***
	(0.152)	(0.159)	(0.157)	(0.157)
Shareholder E-preference	-0.943***	-1.556***	-0.845***	-1.216***
	(0.202)	(0.176)	(0.162)	(0.170)
E-score # Shareholder E-preference	3.817***	3.605***	1.376**	2.394***
	(0.477)	(0.582)	(0.559)	(0.551)
Firm Size (Log. Sales)	-0.246***			
	(0.021)			
Firm Size (Log. Total Assets)		-0.425***	-0.326***	-0.383***
		(0.008)	(0.008)	(0.009)
Leverage	0.012***	-0.013***	0.014***	0.007**
	(0.004)	(0.004)	(0.004)	(0.004)
Capital Expenditures	0.018	0.070***	0.195***	0.191***
	(0.033)	(0.026)	(0.028)	(0.028)
Return on Assets	2.522***	3.936***	4.402***	4.254***
	(0.129)	(0.192)	(0.191)	(0.189)
Constant	6.840***	8.040***	6.313***	7.138***
	(0.463)	(0.131)	(0.129)	(0.137)
Firm Fixed Effects	yes	no	no	no
Country Fixed Effects	no	yes	no	yes
Industry Fixed Effects	no	no	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Observations	42,965	43,665	43,665	43,665
Adjusted R-squared	0.753	0.265	0.324	0.354

Table 6 continued:

Panel B: S-score

Dependent: Tobin‘s Q	(1)	(2)	(3)	(4)
S-score	-0.812***	-0.212	-0.203	-0.173
	(0.188)	(0.170)	(0.160)	(0.161)
Shareholder S-preference	-1.503***	-2.130***	-0.987***	-1.693***
	(0.215)	(0.195)	(0.185)	(0.190)
S-score # Shareholder S-preference	3.274***	3.717***	1.684***	2.833***
	(0.406)	(0.400)	(0.385)	(0.385)
Firm Size (Log. Sales)	-0.245***			
	(0.021)			
Firm Size (Log. Total Assets)		-0.437***	-0.315***	-0.359***
		(0.008)	(0.007)	(0.008)
Leverage	0.011***	-0.012***	0.013***	0.006
	(0.004)	(0.004)	(0.004)	(0.004)
Capital Expenditures	0.017	0.079***	0.193***	0.187***
	(0.033)	(0.026)	(0.028)	(0.028)
Return on Assets	2.509***	3.863***	4.371***	4.209***
	(0.129)	(0.191)	(0.192)	(0.190)
Constant	7.105***	8.361***	6.307***	7.068***
	(0.472)	(0.148)	(0.144)	(0.150)
Firm Fixed Effects	yes	no	no	no
Country Fixed Effects	no	yes	no	yes
Industry Fixed Effects	no	no	yes	yes
Year Fixed Effects	yes	yes	yes	yes
Observations	42,965	43,665	43,665	43,665
Adjusted R-squared	0.753	0.270	0.323	0.352

6 Conclusion

Utilizing the financial system to support a sustainable transformation of the economy - as envisaged in the Paris Agreement and, in a broader context, in the United Nations' SDG initiative - harbors several debatable issues that are addressed in this dissertation. Specifically, the included articles deal with related implications for the key actors in the equity market, i.e. investors (or intermediaries), shareholders as well as stock corporations. Furthermore, this dissertation provides insights on whether responsible investing provokes a corresponding reaction by investee firms and thus serves the superordinate goal of sustainable prosperity.

The Paris Agreement's announced transition process from a carbon-based to a more climate-friendly economy (UNFCCC, 2015) not only poses uncertainties for carbon-intensive business models but also for their investors. In this context, the first article, with its analysis differentiated by investor type, contributes to the identification of the most important carbon risk-takers a well as their potential for successful engagements on corporate emission policies. The results show that especially governments occupy a prominent position from both perspectives. Besides shareholder engagement, the second article introduces portfolio decarbonization as an alternative (or as a supplement) to manage carbon risk exposure. In this respect, the findings indicate that institutional investors exhibit herding behavior, which is primarily led by investment advisors and hedge funds.

Alongside the establishment of responsible investment practice, its influence on corporations is crucial to a successful transformation of the economy. In this regard, the third article of this dissertation undercovers that corporations whose owners show certain characteristics of sustainable investing significantly improve their own sustainability efforts. Finally, the fourth article shows that corporate sustainability efforts have a positive impact on firm value if shareholders pose a corresponding preference.

The results of this dissertation are highly relevant to various market participants, policy-makers, and regulators. First, policy-makers and regulators, respectively, can use these insights in the context of implementing the Paris climate targets in national legislation. However, given their high carbon risk exposure, governments themselves would be one of the most affected actors of such regulations, which could tempt them to delay or avoid implementing these targets. Nevertheless, the results also indicate that certain types of investors could act as role models in dealing with carbon risk. Targeted individual regulation of these investors might lead to desirable imitation effects in terms of decarbonization.

Second, the results of this thesis are also relevant to corporate management. Given the increasing demand for responsible investment opportunities, improving corporate social responsibility can be considered as a value-enhancing strategy. Accordingly, CSR is not exclusively dependent on a philanthropic management but can be embedded into shareholder value-based decision-making.

Since the results of this thesis indicate that corporations are responding to the sustainability preferences of corporate owners, this also implies a certain responsibility for shareholders. Accordingly, this dissertation ultimately also addresses (potential) shareholders in order to sensitize them to their securitized participation rights and the associated responsibility.

The methodology introduced in the third article for quantifying ownership characteristics addresses several points of criticism of previous approaches. Simultaneously, it offers a new category of firm-level variables, opening a multitude of possibilities for further research. The analysis contained in the fourth article builds on this methodology and shows the relevance of these variables in empirical research. Thereby, the methodology is not only applicable with regard to sustainability aspects but can be used generally for all measurable firm variables. For example, future research may address the influence of certain ownership characteristics, such

as a preference for lavish dividends, on a firm's future dividend policy. Another interesting area of research could be to identify specific ownership preferences that have explanatory power for a corporation's financial performance. Finally, already existing research findings concerning the influence of owners on their firms can be verified or refuted by using this novel approach.

Concerning the empirical investigations contained in this dissertation, great attention is paid to comprehensive data samples from reliable data sources. Nevertheless, some limitations must be mentioned here. This refers in particular to the availability and reliability of data on corporate sustainability, such as ESG scores and carbon emissions. Since the disclosure of non-financial sustainability data is generally voluntary, only a fraction of the corporations listed on stock exchanges worldwide can be assessed in terms of their CSR and thus be used for corresponding empirical investigations. Furthermore, the lack of uniform and mandatory disclosure entails the risk of selection bias within the samples. In this context, an optimistic reference can be made to the European Green Deal already mentioned to introduce this dissertation, which also stipulates a mandatory and standardized disclosure of corporate sustainability data (European Commission, 2020b).

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