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Ownership Dynamics and ESG Performance: The Role of Shareholder Concentration and Insider Participation

Evidence from Europe

Jialin Ni

Clarissa Tuutti

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Aalto-yliopisto
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Aalto University

Authors Jialin Ni, Clarissa Tuutti

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Abstract

The integration of Environmental, Social and Governance (ESG) factors into corporate decisions has significantly increased due to evolving investor sentiment and stringent regulation, yet firms still retain discretion in their level of ESG commitments. In this study, we investigate the relationship between ownership structure and ESG performance using OLS fixed effect regressions on a European dataset of 8,439 firm-year observations from 2002 to 2022.

Overall, we find that ownership concentration is negatively associated with ESG performance, especially when insiders possess significant blockholdings. Conversely, institutional ownership shows no significant relationship with ESG performance. A potential explanation for the result is that insiders, who typically hold less diversified investments, resist ESG improvements due to the trade-off between corporate spending on ESG and financial gains, whilst institutional owners may be more open to prioritize ESG, motivated by regulation. Our analysis also reveals non-linear relationships: while insider ownership is generally associated with lower ESG performance, the relationship improves at high levels of insider ownership. In contrast, institutional ownership is positively related to ESG scores at low to moderate levels but less so at higher levels.

Further, we find that the relationship between ownership and ESG varies by ESG aspect and time period. The negative association of insiders seems to weaken when ESG measures align with financial goals: for example, the level of ESG controversies remains the same regardless of whether insider ownership is high or low. Additionally, over time, the association between insider ownership and ESG scores has become less negative, while institutional investors have shown a positive association in recent years.

Our findings suggest that ownership structures and ESG practices are influenced by complex, idiosyncratic factors, highlighting the importance of considering both ownership concentration and identity in understanding ESG dynamics. This research provides valuable insights for investors, policymakers, and corporate managers in navigating ESG investments and performance.

Keywords ESG; CSR; Ownership; Insider; Institutional; Agency Theory; Ownership Concentration; Incentives.

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Aalto University

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Tiivistelmä

ESG-tekijöiden (*Environment, Social and Governance;* Ympäristö, Sosiaalinen vastuu ja Hyvä hallintotapa) integrointi yritystoimintaan on lisääntynyt merkittävästi muuttuvien sijoittajapreferenssien ja tiukemman regulaation vuoksi, mutta yrityksillä on edelleen paljon vapautta valita, miten ESG tekijöitä sisällytetään päätöksentekoon. Tässä opinnäytetyössä tutkimme yrityksen omistusrakenteen ja yrityksen ESG-performanssin välistä suhdetta analysoimalla 8 439:n yritys-vuosi havainnon otosta Eurooppalaisista yrityksistä vuosina 2002-2022.

Havaitsemme, että keskittynyt omistus korreloi negatiivisesti yrityksen ESG arvosanojen kanssa. Tämä negatiivinen suhde selittyy erityisesti sisäpiirin omistusosuuksilla, kun taas instituutio-omistuksella ei ole merkittävää yhteyttä yrityksen ESG:n tasoon. Yksi mahdollinen selitys havainnolle on, että vähemmän diversifioidut sisäpiiriomistajat saattavat todennäköisemmin vastustaa sijoituksia ESG:hen, jos ne kilpailevat taloudellisten voittojen kanssa, kun taas instituutionaaliset sijoittajat saattavat olla avoimempia ESG:lle tiukemman regulaation motivoimana. Analyysimme paljastaa myös epälineaarisia suhteita: sisäpiiriomistus näyttää yleisesti liittyvän alhaisempiin ESG-arvosanoihin, mutta hyvin korkealla sisäpiiriomistuksen tasolla ESG performanssi vuorostaan paranee. Vaikka matalan tai keskitason instituutio-omistus korreloi positiivisesti ESG:n kanssa, hyvin korkea institutionaalinen omistus on taasen yhteydessä matalampiin ESG-arvosanoihin.

Lisäksi havaitsemme, että omistajuuden ja ESG:n välinen suhde vaihtelee eri ESG:n dimensioiden välillä ja on muuttunut ajan myötä. Sisäpiiriomistuksen negatiivinen assosiaatio ESG:hen on heikompi, kun ESG-aktiviteetit ovat linjassa taloudellisten tavoitteiden kanssa: esimerkiksi ESG-skandaalien määrä on samalla tasolla riippumatta siitä, onko yrityksen sisäpiiriomistus korkealla tasolla vai ei. Ajan mittaan sisäpiiriomistuksen ja ESG:n välinen suhde on myös muuttunut vähemmän negatiivisesti, kun taas institutionaalinen omistus on korreloinut positiivisesti ESG:n kanssa viime vuosina.

Tuloksemme viittaavat siihen, että omistusrakenteisiin ja yritysten ESG-käytäntöihin vaikuttavat monimutkaiset tekijät, korostaen sekä omistuksen keskittymisen että omistajien identiteetin huomioimisen tärkeyttä ESG-kontekstissa. Tutkimuksemme tarjoaa arvokkaita näkemyksiä sijoittajille, poliittisille päättäjille ja yritysjohtajille ESG-sijoitusten ja ESG-aktiviteettien ohjaamiseen.

Avainsanat ESG; Yritysvastuu; Omistajuus; Sisäpiiriomistus; Institutionaalinen omistus; Agenttiteoria.

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1 Introduction

The proportion of firms having to factor ESG (Environmental, Social, and Governance performance) and sustainability in corporate decisions, such as financing, investments, and operations, has vastly risen during recent years driven by changing investor sentiment and stringent regulation. The EU Non-Financial Reporting Directive (NFRD) has mandated large firms to disclose information and key performance indicators related to environmental and social matters, such as emissions, human rights, anti-corruption and bribery since it was established in 2014 (European Commission, 2014) and the Corporate Sustainability Reporting Directive (CSRD) coming into force in 2024 will soon extend the reporting requirement to cover a broader set of large companies along with listed SMEs (European Commission, 2024). As a result, more and more companies are under higher scrutiny over the social responsibility of their operations, creating the incentive to prioritize sustainability more than previously.

Despite this growing emphasis on social responsibility, companies still have a significant amount of discretion when deciding on the level of ESG pursued, as regulation usually only sets a minimal baseline. Determining the optimal level of ESG commitment for a firm is challenging, given that there is no universally applicable standard that suits all companies. The vague nature of ESG contrasts with firm value, where a higher value is always better. In some cases, pursuing ESG may be complementary to financial performance: for example, ESG can lead to higher organizational commitment boosting employee productivity (Brammer et al., 2007) and reduce firm costs through resource efficiency (Koller et al., 2019). However, many ESG efforts require significant resources while their financial benefits may be more unclear, resulting in a trade-off between ESG and firm value. This complexity in the nature of ESG efforts increases the importance of firm level factors and, in particular, the role played by company ownership structure, as owners play a major role in shaping company strategy through activism, voting in annual general meetings, and decisions in officer elections.

The way company owners influence firm ESG commitment is determined in particular by the concentration of ownership in a firm as well as owner identity. While concentrated ownership gives large blockholders more influence, agency theory proposes that as an investors' ownership share in a company increases, they may resist ESG investments more if the financial returns are unclear, due to bearing a larger part of the costs of ESG pursuits, while the benefits accrue to all shareholders (Barnea & Rubin, 2010; Jensen and Meckling, 1976). Similarly, there are also large differences between different types of shareholders. Insiders—such as executive and family owners—may feel the negative impacts of ESG initiatives more acutely, if these initiatives compromise financial performance, due to less diversified portfolios (Abeysekera and Fernando, 2020; Rees & Rodionova, 2015). In contrast, institutional investors may be more directly motivated to invest sustainably by regulation such as the Markets in Financial Instruments Directive II (MiFID II) or the Principles for Responsible Investment (PRI), and

may use ESG as a way to manage risks, since this may provide reputational insurance against negative future events (Fu et al., 2019) and lower cash flow risk (Nguyen et al. 2020). These aspects are especially important to institutions, who act as monitoring stakeholders (Brickley et al., 1988; Fama, 1980; Pound, 1988; Pound, 1992; Turban and Greening, 1997). Additionally, investment managers making investment decisions on behalf of clients can introduce unique agency issues not faced by insiders (Bebchuk et al., 2017), possibly contributing to over or underweighting of ESG factors relative to what the ultimate investors might prefer.

Further, preferences of owners, regardless of whether they contribute to financial performance, can play a part in a company's commitment to ESG. Many surveys report a preference by investors for ESG, even if it comes at a cost: 66% of institutional investors agree that companies should make expenditures to address ESG issues relevant to their business even if it reduces short-term profitability (PwC, 2023) and two out of three participants in a pension plan supported more engagement with companies on selected Sustainable Development Goals, even if it reduces investment returns (Bauer et al., 2021). The results imply that over half of both institutional investors and individuals alike prefer to prioritize ESG even if it comes at the expense of financial returns, although in practice, actions may vary from the preferences stated in surveys. In summary, the potential relationship between ownership and ESG performance is likely to be complex due to multiple opposing forces such as agency theory, owner identity, external pressures, and personal preferences. While certain groups, such as insiders, large stakeholders, or institutional investors may have rational reasons for acting in certain ways, there can always be external factors, such as preferences, affecting in-group variation.

Partly due to these multiple interacting forces, findings on the association between ownership and ESG have been diverging. There are some indications of significant blockholdings being negatively associated with ESG performance (Dam & Scholtens, 2012; Ducassy & Montandrau, 2015). In terms of insider ownership, previous literature has often found a negative association (Abeysekera & Fernando, 2020; Barnea & Rubin, 2010; Hettler et al., 2021; Rees & Rodionova, 2015), but also positive links have been found when looking at specific dimensions of ESG such as employee, diversity and environmental aspects (Berrone et al., 2010; Block & Wagner, 2012). For institutional ownership, previous literature has often suggested a positive relationship, particularly for long-term institutional investors (Chen et al., 2020; Dyck et al., 2019; Gloßner, 2019; Kim et al., 2019), but also negative links have been found for example for institutional blockholdings (Borghesi et al., 2014; Cheng et al., 2022; Gloßner, 2019). Lastly, nonlinear relationships between ESG performance and insider and institutional investors have also been found (Jiraporn & Chintrakarn, 2013, Oh et al., 2015).

With our research, we aim to reconcile these diverging findings of literature. We evaluate a sample consisting of 8 439 firm-year observations in the UK, Germany, France, Italy, Spain, and the Netherlands from the years 2002-2022. Our

analysis explores owner identity (insider and institutional owners), ownership concentration, and their relationship to various ESG dimensions. Extending beyond previous literature, which predominantly focuses on one of either owner type or owner concentration, we document that both total ownership concentration and owner identity of largest blockholders matter with relation to ESG performance. Ownership concentration on average is negatively related with ESG performance, consistent with previous literature hypothesizing that large owners resist ESG improvements due to bearing a larger proportion of costs (Barnea & Rubin, 2010; Jensen and Meckling, 1976). However, if insiders are the ones with significant blockholdings, the negative impact on ESG performance becomes even more pronounced. Our findings align with prior studies on trade-off theory, which suggest that insiders, due to their limited diversification in investments, perceive greater financial risks from ESG initiatives compared to non-insiders, and therefore are more likely to resist ESG efforts (Abeysekera and Fernando, 2020; Rees & Rodionova, 2015). In contrast, although previous literature (i.e. Chen et al., 2020; Dyck et al., 2019; Gloßner, 2019) often reports a positive relationship between institutional owners and ESG, our findings indicate no association when insider ownership is controlled for. This observation may explain why previous research on the relationship between institutional ownership and ESG has produced mixed results, as outcomes can vary depending on how researchers categorize owners and which comparison groups they use.

Although the existence of insider owners at high concentrations is strongly negatively associated with ESG performance, we also find some indications that the trade-off dynamic might be weaker when an ESG measure is more aligned with financial goals. For instance, the Social pillar of the ESG score shows a less negative association with insider concentration compared to the Environmental and Governance pillars. Simultaneously, aspects such as employee satisfaction within the Social pillar may often be more closely tied to financial performance improvements (Brammer et al., 2007). One possible explanation may be that due to increased financial alignment, insiders might prioritize initiatives within the Social pillar, as these are more directly connected to their own financial interests. Furthermore, the occurrence of ESG controversies is not linked to insider ownership. Instead, fewer ESG controversies are associated with the presence of large blockholders. A plausible explanation for these findings could be that all owners strive to minimize these events irrespective of their identities, recognizing their detrimental impact on all stakeholders. Taken together, the observed relationships between the Social pillar, ESG controversies, and insiders may suggest that insiders avoid ESG practices when they are personally detrimental, but are more willing to engage in them when there is a financial benefit. Additionally, it seems that owner identity is more relevant to positive ESG performance, which often involves a wider range of beneficial outcomes. Conversely, ownership concentration might be more critical in negative ESG scenarios or ESG controversies, as these issues negatively impact all stakeholders, especially those with larger investments.

Moreover, we find a non-linear relationship between ESG scores and different types of ownership, specifically insider and institutional ownership, at varying levels of concentration. Insider ownership shows a convex relationship with ESG: initially, ESG scores decrease as insider ownership increases, but this trend is mitigated at higher levels of ownership, where scores begin to improve, consistent with Oh et al. (2015). This may be due to agency costs decreasing as insiders increasingly hold a controlling stake (Gugler et al., 2006; Jensen and Meckling, 1976), thereby becoming more motivated to enhance ESG. Conversely, institutional ownership demonstrates a concave relationship with ESG: scores rise with an increase in ownership at low levels, yet start to decline at higher levels, consistent with Oh et al. (2015). Institutional investors may promote ESG for risk mitigation benefits (Fu et al., 2019; Nguyen et al. 2020) but their support may wane at very high ownership levels due to the rising costs of further investments in ESG. The findings further underscore that the identity of the largest blockholders is important for understanding ESG performance, as insider and institutional investors are associated with significantly different ESG outcomes even at different concentrations. Moreover, it may be that a non-linear relationship better describes the link between ESG performance and ownership types. While no linear association was found for institutional owners, a non-linear association was observed.

In our additional analyses, we investigate year subsamples and further account for two factors that may contribute to our results exhibiting negative associations between insiders and ESG: the availability of financial resources and management incentives. We find that the relation between owner identity and ESG scores has changed in recent years: insiders have become less negatively associated with ESG scores over time while institutional investors are positively associated with ESG in the most recent subsample. We find that the level of financial resources available in a firm do not explain the negative correlation observed between insider ownership and ESG performance: companies with high insider ownership have lower ESG performance even in cases where financial resources are high. Similarly, we find no evidence that the observed negative relationship between insider ownership and ESG performance is exacerbated or mitigated in companies with ESG performance targets, more long-term performance targets, higher total executive compensation, or CEO compensation that is linked to the total shareholder return. Our findings reveal idiosyncrasies, possibly implying varying preferences of controlling insiders regarding the optimal level of ESG. Alternatively, these variations could be influenced by exogenous factors not accounted for in our models.

We contribute to previous literature in several ways. First, our analysis offers a more comprehensive view of how ownership concentration, owner identity and ESG performance are linked. Unlike previous studies on the topic, which mainly focus on institutional ownership, we also consider insider ownership and ownership concentration in a holistic manner. This relatively unexplored area adds nuance to the previous findings on the link between ownership structure and

environmental, social, and governance performance. Secondly, our research enhances existing studies by using more recent data and expanding the analysis to multiple European markets. These markets are distinct from the U.S. markets that most existing literature focuses on, primarily due to differences in ownership concentration, with Continental Europe having on average higher ownership concentration levels (La Porta et al., 1998), and a more pronounced emphasis on ESG, driven by European Union legislation (European Commission, 2014; European Commission, 2024). Lastly, we add to the literature by examining ESG controversies in addition to ESG performance scores, providing a more complete picture of the relationship between ownership and ESG. To our knowledge, we are the first to find that the identity of the largest blockholders is less crucial in ESG controversies or negative ESG outcomes, where the concentration of ownership alone is significant. However, we propose owner identity becomes more relevant in ESG Performance, where there is a broader range of acceptable options for companies that are not value destroying

Our study has several limitations that should be acknowledged. The quality of ESG data is a concern, as it may not fully reflect the true commitments of firms, and different data sources can produce varying outcomes (Kotsantonis and Serafeim, 2019). To address this, we conducted robustness checks using data from both Refinitiv and MSCI. Additionally, our analysis explores insider and institutional investors at a general level. A more detailed examination of owner identity, such as differentiating between family shareholders and short- and long-term institutional investors, could provide further insights. Furthermore, the use of OLS/fixed effects regression models introduces certain limitations, as the strength of our instruments impacts result interpretation. Although our robustness checks mitigate some of these issues, they do not fully resolve them. Moreover, our analysis is based on ownership figures from Refinitiv and limited to the ownership of the five largest shareholders, which may not always provide the entire picture of company ownership. Finally, we cannot establish causal relationships between ownership and ESG performance, and there may be endogeneity issues, such as institutional investors potentially favoring firms with high ESG performance.

The rest of our research is structured as follows. Section 2 examines the theoretical background and previous literature on the topic. In Section 3, we describe the data and methods used in the paper. Section 4 shows our main analysis on ESG performance and ownership. Section 5 incorporates additional analysis with lenses on variation over time, ESG incentives, compensation, and financial resource availability. In Section 6 we perform robustness checks to examine the robustness of our main findings. Lastly, we conclude in Section 7.

2 Theoretical background

Owners hold an important role in shaping a firm's ESG strategy. However, there are many factors influencing owner attitudes toward ESG, contributing to the complexity of the topic. Firstly, the business and financial implications associated with ESG activities play a key role in relation to owner motivations. Additionally, both the concentration of ownership within a firm and the identity of owners influence agency costs and company decision-making, with important implications for company ESG performance. Lastly, the motivations driving the actions of insider and institutional investors are distinct, resulting in different approaches to ESG for these two major shareholder groups. This section will explore the aforementioned elements, along with the theories and previous literature that underpin them.

2.1 ESG/CSR as a part of company performance

In addition to the vast literature examining companies' financial performance, a large body of research concerned with companies' environmental, social and governance (ESG) and corporate social responsibility (CSR) actions has emerged. In literature, the term ESG is often used to refer to the way in which companies integrate environmental, social and governance into their operations while CSR is generally used to refer to the social responsibility or "corporate citizenship" of companies (Gillan et al., 2021). In our thesis, we will use the terms interchangeably. ESG and CSR are both umbrella terms capturing a broad range of activities from emissions reduction initiatives and sustainable product design to fair labor practices and ethical corporate governance. To understand the relationship between ESG and company ownership, it is therefore important to first understand the underlying dynamics of company ESG performance.

A key factor shaping owner motivations toward ESG are the business and financial consequences associated with ESG activities. No consensus regarding the role of ESG/CSR as part of company performance exists, however a number of theoretical frameworks have been explored. One view suggests that companies face a trade-off when choosing between investments in CSR and investments in financial performance and as a result, companies that invest more in CSR do less well in economic terms (McGuire et al., 1988). In the context of ESG investments that are detrimental to financial performance, shareholder theory indicates that companies should refrain from investing in such activities since they are value-destroying. In contrast to this traditional shareholder view, stakeholder theory suggests that companies not only need to meet the demands of shareholders but also need to appeal to other stakeholders such as employees, customers, and suppliers (Cornell & Shapiro, 1987). Under this view, CSR is undertaken because it benefits other company stakeholders, increasing their willingness to support the company's operation, which ultimately creates value for shareholders as well (Cornell & Shapiro, 1987; Jian & Lee, 2014). In practice, improving ESG

performance can be costly while the financial benefits may be limited: as an extreme example, a company giving charitable donations without advertising their efforts to customers is incurring a direct financial cost with no clear corresponding benefit. On the other hand, previous research has found many benefits to better ESG such as lower production costs due to less wasted materials (Calabrese et al., 2016), better attraction of talented employees (Greening & Turban, 2000) and lower capital constraints (Cheng et al., 2014), which would encourage owners to pursue ESG.

Previous literature has also established that company social responsibility is a multidimensional concept, indicating that owner attitudes toward ESG may differ between the dimensions of ESG. Certain dimensions of CSR relate to benefits that fall outside the firm (e.g. emissions reduction) while other aspects may also benefit the company itself (e.g. product development and employee training) (Rees & Rodionova, 2013). Consequently, different forms of ESG can have differing implications for firm financial performance: for example, responsible actions in employee, customer and supplier dimensions have been found to be complementary to financial performance while responsibility towards the environment, customers and suppliers is more likely to involve a trade-off with financial performance (Cavaco & Crifo, 2014). As a result, the conclusions drawn on the relationship between ownership and company social responsibility may differ significantly based on the measure of ESG. Additionally, many studies make a distinction between CSR strengths and CSR concerns or controversies. Strengths include more proactive and future-oriented socially responsible activities, while CSR concerns includes current deficiencies (Hettler et al., 2021). The two represent a different view of ESG/CSR with distinct implications for company performance, influencing owner attitudes in the process.

2.2 Shareholder concentration and ESG performance

Generally, concentrated ownership grants blockholders significant influence upon a company, giving rise to principal-agent conflicts and conflicts between majority and minority shareholders (Ginglinger & Lher, 2006). Through increased availability of resources and autonomy to pursue self-interests, which rise with control and decrease with external monitoring, owners can significantly influence CSR (Baron & Harjoto, 2011). While concentrated control gives blockholders more freedom to act upon their CSR preferences, blockholders also bear the costs of overinvesting in CSR as their holdings increase. As a result, a portion of literature suggest that concentrated control is related to negative ESG performance because of creating a “free-rider” issue.

Barnea and Rubin (2010) describe the agency conflict arising between majority and minority shareholders related to CSR: when large shareholders and managers face minimal costs, they may encourage firms to over-invest in CSR to enhance their reputation. However, if they own a substantial stake in the company, they are less inclined to pursue this as it could negatively impact their investment

value. Empirically, Dam and Scholtens (2012) analyze CSR policies of 700 European multinational firms, and discover a negative correlation between the proportion of shares held by the largest blockholder and CSR policies and performance, across four ownership concentration metrics. Ducassy and Montandrau (2015) also find a negative relationship between concentrated control and CSR in their empirical analysis of French companies. Both empirical studies support the idea that despite the potential benefits of CSR for all stakeholders, the efforts of large shareholders to improve CSR are not directly rewarded. This lack of direct incentives may deter these shareholders from implementing changes that would benefit "free-riders" as well.

Meanwhile, moderate ownership dispersion can alleviate agency issues stemming from large shareholders' reluctance to overinvest in ESG. Ducassy and Montandrau (2015) find that dispersed ownership produces the greatest social performance. In literature regarding firm value and ownership, moderate levels of ownership dispersion have been associated with optimal firm performance, as they provide a balance between entrepreneurial initiative and effective monitoring (Schulze et al., 2002). However, if taken too far, excessive dispersion in company ownership can lead to additional agency problems and suboptimal outcomes due to weakened monitoring mechanisms and reduced alignment of interests between shareholders and management (Schulze et al., 2002).

On the other hand, to reduce harm and address asymmetric information, owners may be motivated to enhance ESG performance, particularly in the Social pillar. A company's prioritization of enhancing social welfare and tackling critical social issues can serve to benefit a diverse set of stakeholders and reduce conflicts (Freeman, 2010). Additionally, the adoption of CSR initiatives has the potential to alleviate conflicts of interest between managers and other stakeholders, thereby contributing to an increase in firm value (Jo & Harjoto, 2012). For instance, acts of philanthropy like charitable donations can foster a positive perception of the donating company among stakeholders, effectively nurturing stakeholder relationships (Brammer & Millington, 2005). Literature suggests that improvement benefiting stakeholders, like employees or society at large, can simultaneously increase firm value and ESG performance by resolving conflicts among interested parties. This challenges the idea that all ESG efforts are detrimental to large shareholders.

The following sections will delve into the conceptual framework that drive different owner types, such as insiders, including family and management, as well as institutional investors, to favour particular levels of ESG commitment. While owners may not always exhibit rational behavior, understanding the theoretical basis for how different investor types are incentivized to act provides a framework for analyzing the relationship between owner identity and ESG performance.

2.3 Insider investors and agency theory

The separation of ownership and control serves as the cornerstone for predicting the behaviours of insider-controlled companies. While shareholders traditionally prioritize firm value maximization, management oversee the day-to-day operations. However, if the management lack a direct stake in the company, they may not share the same level of concern for its long-term success, thus giving rise to various types of agency conflicts.

Concentrated ownership at the hands of insiders can lead to entrenchment and heightened maximization of private benefits for the controlling shareholder. Insiders may use company assets to further their own interests when shareholders are too scattered to intervene against non-value maximizing behaviour, as first theorized by Berle and Means (1968). Such non-value-maximizing behaviour might result in actions like empire-building and neglecting the welfare of employees. Providing empirical support for the entrenchment theory, Morck et al. (1988) discover a decreased business performance for companies with substantial management holdings as well as a negative effect of founding families on the success of older organizations. Shleifer and Vishny (1989) argue that managers are inclined to lessen the likelihood of being replaced by making manager-specific expenditures that increase the cost of replacing them for shareholders and give them greater influence over business strategy.

Nonetheless, it is suggested that management entrenchment only increases until a particular turning point. Jensen and Meckling (1976) argue that when insider ownership rises, agency costs decrease because managers bear a greater share of the cost burden and should, therefore, engage increasingly in value-maximizing activities. Insiders start acting in the best interests of the company rather than their own, as the interests of shareholders and insiders eventually align.

In summary, the separation of ownership and control gives rise to two theories explaining insider behaviour: 1) The entrenchment theory, which proposes that as insider shareholding rises, the chance of replacement through a proxy war or takeover decreases, which allows insiders greater autonomy to seek personal gain and 2) the convergence-of-interest hypothesis, which states that as insider ownership increases and their wealth is more significantly tied to the value of company shares owned, their interests start to align with the overall benefit of the company. (Gugler et al., 2006).

2.4 Insider ownership and ESG performance

Literature on insider shareholding and ESG performance has been somewhat mixed, but often a negative association between the two has been reported. A large proportion of literature focuses on family firms: Rees and Rodionova (2015) find that both closely held equity and family ownership are negatively associated with ESG performance in their study across 46 countries. However, when Governance factors are controlled for, the association with closely held equity disappears, while the negative relationship with family ownership remains. Likewise, Abeysekera and Fernando (2020) find that U.S family firms undertake lower levels of environmentally responsible investments when there is no financial benefit to shareholders. Investigating insider ownership in general and providing further support for the managerial entrenchment theory, Hettler et al. (2021) find a negative association between excess insider control (voting control over cash flow rights) and overall CSR performance from a sample of U.S. dual class firms. The negative effect is primarily driven by community- and employee -related dimensions and mitigated in firms with high financial resource availability. Lastly, Barnea and Rubin (2010) find that insider ownership is negatively related to a firm's social rating investigating a sample of 3000 U.S. Corporations.

Previous literature has suggested that family equity owners may oppose ESG initiatives, perceiving them as value-destructive, due to a lack of diversification among controlling families (Rees and Rodionova, 2015; Abeysekera and Fernando, 2020). This idea is further supported by Schulze et al. (2002): outside owners are more likely to prefer growth-oriented risk taking, as they benefit solely from the appreciation of shareholder value and are indifferent to the risk level, which they can reduce by holding a diversified portfolio. In contrast, insiders are mostly invested in few companies, and therefore define the value of decisions in terms of utility, where the risk undertaken matches their preferences for certain outcomes. When applying the framework to ESG, insiders may be more aware of the risks associated with pursuing ESG, which could result in a negative bias towards it.

On the other hand, positive links between insider shareholding and ESG performance have also been suggested in previous literature. Berrone et al. (2010) find that family-controlled U.S. firms have better environmental performance than nonfamily firms and the positive effect persists independent from whether the CEO is a family member or serves also as chairman of the board. Additionally, Block and Wagner (2012) find that family ownership in large US family firms is positively associated with diversity-, employee-, environment- and product- related dimensions of CSR and negatively associated with the community-dimension utilizing Bayesian regressions. The conclusion on whether there is a positive or negative relationship might therefore vary depending on how the elements making up the total ESG score are broken down, how long the period taken into consideration is, and how much emphasis is placed on major firms.

Because of the conflicting evidence and various forces driving insider motivations, a portion of literature has also explored a U-shaped association with ESG performance. Investigating a sample of U.S. Fortune 1000 companies, Oh et al. (2015) report that CSR decreases with insider ownership up to a point after which the relationship between the two is positive. Agency conflicts are a likely contributing factor to the nonlinear effect: while a negative ESG score reduces reputation and damages a company's ability to raise capital (Wong & Zhang, 2022), excessive emphasis on ESG may lead to conflict between institutional investors and other shareholders as it distracts from firm value maximization (Gloßner, 2019). This may lead to a mechanism, where insiders resist excess improvement in ESG when their ownership exceeds a certain threshold, therefore lowering overall ESG performance. At the highest levels on insider concentration, where both agency conflicts and managerial entrenchment are reduced, and insider interests are aligned with general firm interests, the importance of ESG could rise through maximization of firm value. CSR has been shown to maximize shareholder value through lowering cash flow risk (Nguyen et al. 2020), and when high insider concentration incentivizes to employ better risk management in pursuit of higher value, an increase in ESG may be a positive side effect.

Adopting a slightly different lense compared to the literature on overall ESG scores, studies looking at ESG controversies have often found either better performance or no difference between performance compared to non-insider owned firms. Block and Wagner (2014) find that founder and family ownership are associated with fewer CSR concerns, arguing that families and founders care more about the reputation of the company as they are likely more associated with it than other owners. In contrast, Hettler et al. (2021) find no association between excess insider ownership and CSR concerns despite observing a negative significant relationship with CSR strengths. The interpretation offered is that although insiders may not go "above and beyond" for CSR strengths to save costs, they may keep a minimum standard for acceptable behaviour as concerns are tied to reduced output and performance.

2.5 Monitoring role of institutional investors

Insider personal gain maximization is mitigated by external forces through monitoring. Fama (1980) suggests that even when managers own a small stake, market forces discipline insiders to act in the interest of the firm. Shleifer and Vishny (1986) argue that large blockholders monitor the management and facilitate third-party takeovers by splitting the large gains on their own shares with their bidder to replace the incumbent underperforming management. Stakeholders with significant interests in the firm will hold internal management to a constant threat of replacement and therefore reduce agency conflicts by disincentivizing actions that maximize insider gains.

Typically, institutional shareholders in particular gain from limiting managerial control. According to Pound (1988), institutional investors typically retain

sizable, illiquid positions, which are difficult to adjust without influencing price. As a result, institutional investors are likely to lead management to take into account long-term interests (Pound, 1992) and to care also about the non-financial performance of the company (Turban and Greening, 1997). Brickley et al. (1988) finds that on average, institutional investors are more likely to vote and involve themselves in firm decisions due to high equity stake. The larger the stake held by institutional investors, the more likely they are to employ strict monitoring, guidance and leadership to push management to the direction of their preferred behaviour.

2.6 Institutional ownership and ESG performance

Similar to insider investors, findings on the relationship between institutional ownership and ESG performance have been somewhat mixed. Many articles have reported a positive relationship between the two: Dyck et al. (2019) find that institutional ownership is positively associated with environmental and social performance in a sample covering 41 countries and Chen et al. (2020) note that company ESG performance improves after an exogenous increase in institutional ownership in their investigation of U.S. Russell Index small cap firms. Some authors also observe a negative relationship between the two: Borghesi et al. (2014) identify that companies with higher institutional ownership are less likely to invest in ESG while Cheng et al. (2022) find that common institutional ownership – ownership by institutional blockholders that simultaneously hold at least two firms in the same industry – is negatively associated with ESG performance.

In particular, literature has found evidence that the presence of institutional investors with a longer-term investment horizon improves ESG performance. Johnson and Greening (1999) argue that mutual funds have no direct correlation to social performance since they are more likely to act as traders looking for short-term profits, while pension fund equity has a positive correlation with ESG since they are more concerned with long-term performance, which may be impacted by social responsibility. It has also been argued that long horizon institutional investors may seek to improve a company's ESG because it provides investors and investment managers as their agents' reputational insurance against negative future events (Fu et al., 2019). Similarly, the monitoring role of long-horizon institutional holders may also allow them to choose the amount of ESG that maximizes shareholder value through lowering cash flow risk (Nguyen et al. 2020).

In addition to investment horizon, the size of the ownership stake and investment style of the investor have also been found to matter. Kim et al. (2019) find that active long-term institutional investors increase company CSR while passive long-term institutions have no significant effect. Similarly, Gloßner (2019) argues that long-term institutional investors encourage CSR by providing managers a relief from short-term pressures, however the positive effect is mitigated by long-term blockholders who ensure through monitoring that CSR is not pursued blindly but according to shareholder interests. The author finds that long-term

institutional blockholder ownership is associated with lower CSR scores but also fewer CSR concerns, indicating that long-term blockholders want to improve company social responsibility through fewer controversies but not through improved CSR strengths.

Research has also found asymmetry in institutional investor preferences depending on whether the focus is on ESG risks or strengths. Nofsinger et al. (2019) find that institutional investors are indifferent to positive environmental and social performance but underweight companies with negative indicators in these dimensions. Additionally, Fernando et al. (2017) find that institutional investors are less likely to invest in companies with high environmental risk exposure but also companies with particularly high greenness scores, indicating that decreasing risk exposure creates value for shareholders but pursuing high greenness does not.

In the context of institutional investors, a large proportion of literature has also studied ESG as a determinant of institutional investor allocations as opposed to institutional investors driving higher or lower ESG performance. Lopez de Silanes et al. (2022) find that institutional investors allocations are strongly driven by the ESG characteristics of portfolio companies, however when it comes to larger ownership stakes, ESG plays a smaller role. Further, the authors report that the preference of institutional investors is stronger for ESG disclosure rather than actual ESG performance quality and that governance factors are more important than environmental and social factors.

Lastly, regulatory aspects are likely to contribute to institutional investor attitudes toward ESG. With the new MiFID II regulation, institutions offering investment advisory services are now explicitly required to estimate the suitability of investments against the sustainability preferences of clients, motivating institutional investment managers to analyse sustainability aspects of investments more carefully (European Securities and Markets Authority, 2024). Similarly, industry networks such as the UN PRI with over 3800 signatories globally may encourage institutional investors to integrate ESG issues into investment processes. For example, principle two dictates that signatories will be active owners and incorporate ESG into ownership policies and practices (UN PRI, 2024), formalizing the role of institutional investors in the ESG context.

2.7 Research questions and hypotheses development

In this section, we formally introduce our research questions and hypotheses. With our research questions detailed below, we aim to reconcile diverging results in the literature. Additionally, research linking ownership and ESG performance often faces limitations that we aim to address. These limitations include a focus on large firms (i.e. Cheng et al., 2022; Oh et al., 2015), reliance on outdated data from before 2013 (i.e. Abeysekera and Fernando, 2020; Borghesi et al., 2014), and a concentration on U.S. markets (i.e. Abeysekera and Fernando, 2020; Barnea and Rubin, 2010; Berrone et al., 2010 ; Block and Wagner, 2012; Borghesi et

al., 2014; Cheng et al., 2022; Oh et al., 2015). Studies focusing on the U.S. frequently use ESG data from the Kinder, Lydenberg, Domini Research & Analytics (KLD) ratings database. This database has been criticized for its CSR strengths not accurately predicting pollution levels or compliance violations, and for high correlation between CSR concerns and strengths (Chatterji et al., 2009). Moreover, research centered on Europe or the global context tends to evaluate only one owner identity—either insider or institutional—often without considering the influence of the other (e.g., Dyck et al., 2019; Rees and Rodionova, 2015) or focuses on ESG policies rather than performance (Dam and Scholtens, 2012). Our comprehensive European study adds further evidence, covering multiple countries and including time series data from 2020 onward, thereby addressing the research gap our study aims to fill.

Firstly, we are interested in answering the following question: Is ownership concentration associated with higher or lower ESG performance? Motivated by controlling shareholders increasingly bearing the cost of overinvestment in ESG along with previous findings of a negative association, we form the following hypothesis:

H1: Ownership concentration is negatively associated with ESG performance.

After forming an overall view of the relation between ownership concentration and ESG performance, we next separate between insiders and institutional owners due to the differences between the two shareholder groups. We are interested in the following research questions: What is the relationship between insider ownership and ESG performance? What is the relationship between institutional ownership and ESG performance? Motivated by theory and previous findings we form the following hypotheses:

H2: Insider ownership is negatively associated with ESG performance.

H3: Institutional ownership is positively associated with ESG performance.

The competing underlying mechanisms of manager entrenchment, incentive alignment and monitoring imply that the ownership-ESG relation may contain both negative and positive dynamics. To capture these effects, we adopt a nonlinear approach. Several articles have reported a non-linear relationship between insider ownership and company performance measures such as Tobin's Q (Cui & Mak, 2002; McConnell & Servaes, 1990; Morck et al., 1988) and similar approaches have previously been adopted in CSR research as well (Oh et al., 2015; Jiraporn & Chintrakarn, 2013). Our hypotheses for insider and institutional ownership follow Oh et al. (2015). For insider ownership, the relationship is hypothesized to be convex (U-shaped): ESG performance decreases with ownership at low levels of insider ownership and increases at high levels of insider ownership. For institutional ownership, the relationship between ownership and ESG

performance is hypothesized to be concave (inverted U-shaped): ESG performance increases with ownership at low levels but at a decreasing rate as the level of ownership increases. We arrive at the following hypotheses:

H4: There is a convex relationship between insider ownership and ESG performance.

H5: There is a concave relationship between institutional ownership and ESG performance.

Lastly, ESG controversies are negative ESG information around a firm, such as environmental or human rights scandals (Cai et al., 2012). In contrast to traditional ESG and its pillar scores, controversies have more direct negative effects on firm value and increase firm risk (Aouadi and Marsat, 2018) and therefore have tangible implications to all owners and their wealth. In other words, avoiding controversies should be the basic effort that any reasonable firm undertakes towards ESG, an action that may be less influenced by preferences compared to a firm optimizing their overall ESG score. Empirical findings on ownership and ESG/CSR concerns are much more limited compared to the literature covering overall ESG/CSR scores, and evidence has been somewhat mixed. Furthermore, it is likely that published papers are likely to only report statistically significant findings, while findings of no association are not as likely to be published. Taken together, the notion that all shareholders should be equally inclined to discourage controversy along with limited prior literature, we form the following hypothesis:

H6: There is no association between ownership and ESG controversies.

3 Data and methods

3.1 Sample

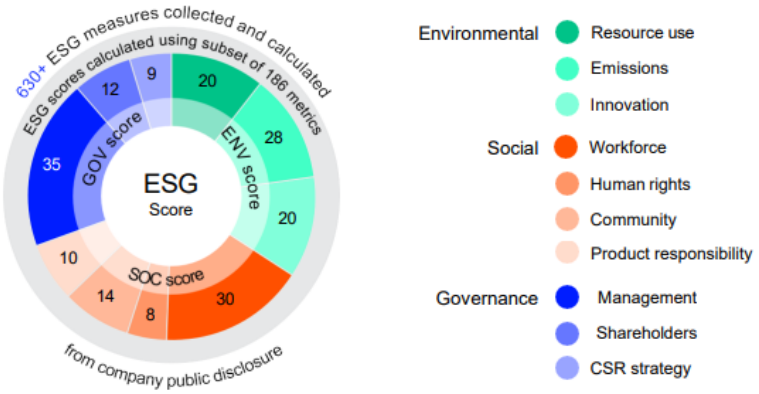
Our sample consists of public companies that are headquartered in six large European countries: the UK, Germany, France, Italy, Spain or the Netherlands. Following prior research (e.g. Hettler et al., 2021), we exclude companies operating in the financial sector from the sample. We collect data for years 2002-2022. After inclusion of all variables, the sample consists of 8 439 firm-year observations. The maximum number of firms in a year is 1 025 in 2021.

Our main data source for company information, control variables, ownership data and ESG scores is Refinitiv. In addition to Refinitiv, we also use S&P Capital IQ and Orbis for ownership data.

3.2 ESG data

To examine the relationship between ESG performance and company ownership characteristics we use the Refinitiv total ESG (ESG), Environment pillar (E), Social pillar (S), Governance pillar (G) and ESG Controversy (ESGC) scores. Refinitiv scores are widely used in ESG literature, such as Dorfleitner et al. (2020) and Demers et al. (2021). The scores are based on verifiable reported data in the public domain, such as annual reports, stock exchange filings, and CSR reports, and the scores are updated on a continuous basis. Based on the collected data, key measures are calculated and grouped into 10 categories that form the three pillar scores and the final ESG scores, as seen in Figure 1. (LSEG, 2023).

Figure 1. Summary of Refinitiv ESG Score Structure



3.3 Ownership data

Because we are interested in company owners that have significant influence in the company, we gather data for the five largest shareholders. Significant influence is often proxied by a voting power of at least 20% and looking at the top 5 ensures that no shareholder above that threshold is left out. The ownership share of the five largest shareholders has also been used in previous literature (e.g. Demsetz & Villalonga, 2001).

As a default, we use the percentage of shares held field in Refinitiv for investor ownership shares and the investor type and subtype fields for categorizing shareholders (see Table 1). For firms with only one listed share, we assume that voting rights equate to cash flow rights.

To supplement Refinitiv data, we use S&P Capital IQ to identify a list of companies that have more than one share class (multiple class or dual-class shares). After requiring that other data is available for the entity, this yields a list of 44 companies. We extract the voting rights figures for these companies manually. This is because Refinitiv figures may not give an accurate description of company ownership, especially if the company has additional stocks with voting power, which are not publicly listed. We source the largest shareholders and % of voting power from company annual reports, corporate governance reports and other company sources.

In our approach, we also take pyramid structures into account. We use Orbis to identify ultimate owners in all circumstances when shareholders registered in Refinitiv are of investor type “Strategic entities” and subtype “Corporation” or “Holding company”. This is due to the possibility of situations where a holding company or corporation appears to control the first level of ownership, but a family or individual investor eventually gains all of the voting rights. In circumstances when Orbis detects an ultimate controlling shareholder of type “One or more named individuals”, we categorize the shareholder as an insider investor. The initial first-stage ownership classification is still in place if Orbis is unable to identify the final control owners.

For the investor types under investigation, we create two main subcategories: institutional and insider investors. We categorize the Refinitiv investor type “Investment Managers” as institutional and investor subtypes “Individual Investor” and “Other insider investor” as insiders. As a result, the insider category includes individual investors or investor groups such as founders, family shareholders or company management. We define the following continuous ownership variables: Top5 (sum of ownership shares of the top five largest shareholders), Insider (sum of the ownership shares of insider shareholders within the top 5 shareholders) and Institutional (sum of the ownership shares of institutional shareholders within the top 5 shareholders).

Table 1. Distribution of the top 5 shareholder observations by Refinitiv category

Investor Type	Investor Subtype	N
Investment Managers	Hedge Fund	639
	Endowment Fund	19
	Foundation	4
	Investment Advisor	14 990
	Investment Advisor/ Hedge Fund	14 967
	Insurance Company	120
	Private Equity	359
	Venture Capital	163
	Bank and Trust	630
	Pension Fund	1 245
	Sovereign Wealth Fund	2 173
Strategic Entities	Corporation	3 265
	Government Agency	798
	Holding Company	5
	Other Insider Investor	1 390
	Individual Investor	5 108
Brokerage Firms	Research Firms	135
Funds	Hedge Fund Portfolio	1

3.4 Control variables

Our main control variables follow Hettler et al. (2021) and are informed by previous literature suggesting a correlation between ESG and company ownership (e.g. Cruz et al., 2014; Dyer & Whetten, 2006; Fombrun & Shanley, 1990; Hasan & Habib, 2017; Rindova et al., 2006; Seaborn et al., 2020).

Our baseline control variables include the following: financial performance (ROA) measured by the net income before extraordinary assets divided by average annual total assets; slack resources (Slack) measured by the difference between current assets and current liabilities scaled by total assets; Company size measured by the natural logarithm of total assets; Company age, calculated as the year of observation less the year the organization was founded; Leverage, calculated by total debt divided by total assets; Tobin's Q, which measures business growth opportunities by dividing the market value of equity plus total debt by total assets; and the stability of a firm's operating environment (Volatility), measured by the standard deviation of stock returns over the past 12 months. For the year the organization was founded, we use either the Refinitiv Organization Founded Year or the year from Refinitiv First Trade Date -field, depending on which one is earlier.

Table 2. Definitions of the main variables

Variable	Definition
ESG	Refinitiv ESG score (higher score indicates better performance)
E	Refinitiv Environment score (higher score indicates better performance)
S	Refinitiv Social score (higher score indicates better performance)
G	Refinitiv Governance score (higher score indicates better performance)
ESGC	Refinitiv ESG Controversies score (higher score indicates fewer controversies)
ROA	Net income before extraordinary assets / average total assets
Slack	(Current Assets – Current Liabilities) / Total Assets
Company size	LN(Total Assets)
Company age	Observation Year – Organization Founded Year
Leverage	Total Debt / Total Assets
Tobin's Q	(Market Cap + Total Debt) / Total Assets
Volatility	12-month standard deviation of monthly stock returns
Top5	Ownership share of the 5 largest shareholders
Insider	Ownership share of the 5 largest shareholders that are insiders
Institutional	Ownership share of the 5 largest shareholders that are institutions

The mean, minimum, 25th percentile, median, 75th percentile, maximum and the standard deviation of the main variables are presented in Table 3. All continuous control variables are winsorized at the first and ninety-ninth percentile. Amongst the sample, the ESG score has a median value of 54.67 and a standard deviation of 20.40. The median E and G scores are lower than the combined ESG score, while S is higher. Concentrated ownership is relatively prevalent within the sample, as the median top 5 ownership is 41% and Top 1 ownership is 16%. Additionally, institutional ownership seems to be common, as the median top 5 institutional holding is 21%, while on the other hand, median insider ownership is 0%, indicating a lower prevalence of insider shareholdings. Furthermore, the sample firms demonstrate solid profitability, with a median ROA of 4.19%, maintain a moderate debt-to-total assets ratio, with a median leverage of 25%, are of considerable size, with a median natural log of total assets at 21.78 and are relatively mature, with a median age of 24 years.

Table 4 shows the distribution of observations by year and by industry. The most recent years, 2020–2022, account for a large part of the observations, as the number of firms in 2022 is almost ten times higher than in 2002. The industries of observations are more equally spread, with the greatest observations in sectors such as Industrial Goods, and Industrial and Commercial Services.

Table 5 shows the correlation matrix of the main variables. Consistent with our hypothesis and the principal-agent theory, top 5 shareholding and insider shareholding is negatively correlated with the combined ESG score and individual pillar scores. In contrast to our expectations, however, institutional shareholding is negatively correlated with ESG, E, and S. Lastly, all individual pillar scores are positively and strongly correlated with the combined ESG score.

Table 3. Sample summary statistics

Control variables ROA, Slack, Company size, Company age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile.

Statistic	N	Mean	Min	Pctl(25)	Median	Pctl(75)	Max	St. Dev.
ESG	8,439	53.50	0.63	38.78	54.67	69.57	95.77	20.40
E	8,439	50.33	0.00	29.67	51.73	72.77	99.06	26.76
S	8,439	56.51	0.26	38.53	58.07	76.21	98.47	23.53
G	8,439	51.67	0.32	33.97	52.63	69.73	99.33	22.54
ESGC	8,439	89.98	0.58	100.00	100.00	100.00	100.00	23.67
ROA	8,439	4.34	-4.85	1.39	4.19	7.54	13.22	4.96
Slack	8,439	-0.09	-0.37	-0.19	-0.08	0.01	0.21	0.15
Company size	8,439	21.82	18.12	20.56	21.78	23.03	25.44	1.77
Company age	8,439	28.49	0.00	14.00	24.00	42.00	59.58	18.50
Leverage	8,439	0.26	0.00	0.14	0.25	0.37	0.59	0.16
Tobin's Q	8,439	1.29	0.02	0.70	1.06	1.92	2.45	0.73
Volatility	8,439	8.54	0.53	5.70	7.75	10.99	14.98	3.58
Top5	8,439	0.45	0.00	0.29	0.41	0.61	1.00	0.21
Institutional	8,439	0.22	0.00	0.10	0.21	0.31	0.98	0.15
Insider	8,439	0.14	0.00	0.00	0.00	0.23	1.00	0.23

Table 4. Number of observations

Panel A: By year

Year	N
2002	42
2003	43
2004	97
2005	192
2006	15
2007	166
2008	199
2009	281
2010	331
2011	351
2012	361
2013	349
2014	367
2015	406
2016	409
2017	462
2018	653
2019	744
2020	977
2021	1025
2022	969

Panel B: By industry

Industry	N
Academic and Educational Services	4
Applied Resources	88
Automobiles and Auto Parts	259
Chemicals	310
Consumer Goods Conglomerates	46
Cyclical Consumer Products	510
Cyclical Consumer Services	681
Energy - Fossil Fuels	390
Financial Technology (Fintech) and Infrastructure	32
Food and Beverages	377
Food and Drug Retailing	136
Healthcare Services and Equipment	254
Industrial and Commercial Services	896
Industrial Goods	838
Mineral Resources	354
Personal and Household Products and Services	107
Pharmaceuticals and Medical Research	322
Real Estate	601
Renewable Energy	58
Retailers	390
Software and IT Services	522
Technology Equipment	280
Telecommunications Services	212
Transportation	342
Uranium	11
Utilities	419

Table 5. Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 ESG	1														
2 E	0.86	1													
3 S	0.9	0.73	1												
4 G	0.7	0.41	0.45	1											
5 ESGC	-0.32	-0.28	-0.28	-0.23	1										
6 ROA	0	-0.01	0	0.02	0.05	1									
7 Slack	0.2	0.2	0.17	0.13	-0.15	-0.19	1								
8 Company size	0.66	0.64	0.6	0.39	-0.42	-0.05	0.32	1							
9 Company age	0.19	0.22	0.17	0.1	-0.09	0.06	-0.02	0.18	1						
10 Leverage	0.16	0.16	0.16	0.07	-0.02	-0.25	0.4	0.21	-0.08	1					
11 Tobin's Q	-0.11	-0.15	-0.08	-0.05	0.13	0.39	-0.18	-0.22	-0.07	-0.08	1				
12 Volatility	-0.19	-0.19	-0.18	-0.09	0.05	-0.33	-0.12	-0.3	-0.14	0.01	-0.11	1			
13 Top5	-0.16	-0.09	-0.08	-0.26	0.14	-0.04	-0.09	-0.15	-0.09	-0.04	-0.05	0.12	1		
14 Institutional	-0.06	-0.09	-0.1	0.06	0.06	-0.03	0	-0.18	0.01	0.01	0.02	0.06	-0.05	1	
15 Insider	-0.13	-0.07	-0.05	-0.23	0.07	0.04	-0.11	-0.07	-0.03	-0.05	0.01	0.07	0.59	-0.44	1

3.5 Methods

In Section 4.1 we commence our research by examining the variations in average ESG, E, S, G and ESG Controversy score between ownership quartiles. In the following sections we use fixed effects regression models to investigate the cross-sectional relationship between ESG and different forms of ownership. We include year, country and industry fixed effects in our models and use robust standard errors clustered at firm level. Control variables ROA, Slack, Company size, Company age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile.

For our baseline analysis, we define the following regression models with control variables following Hettler et al., 2021; Cruz et al., 2014; Seaborn et al., 2020:

$$X_{i,t} = \beta_1 Y_{i,t} + \beta_2 ROA_{i,t} + \beta_3 Slack_{i,t} + \beta_4 Company\ size_{i,t} + \beta_5 Company\ age_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Tobin's\ Q_{i,t} + \beta_8 Volatility_{i,t} + Industry\ FE + Year\ FE + Country\ FE \quad (1)$$

where X is equal to ESG score, Environment score, Social score, Governance score or ESG Controversies score and Y is equal to Top5, Insider or Institutional.

$$X_{i,t} = \beta_1 Insider_{i,t} + \beta_2 Institutional_{i,t} + \beta_3 ROA_{i,t} + \beta_4 Slack_{i,t} + \beta_5 Company\ size_{i,t} + \beta_6 Company\ age_{i,t} + \beta_7 Leverage_{i,t} + \beta_8 Tobin's\ Q_{i,t} + \beta_9 Volatility_{i,t} + Industry\ FE + Year\ FE + Country\ FE \quad (2)$$

where X is equal to ESG score, Environment score, Social score, Governance score or ESG Controversies score.

Motivated by prior research (Oh et al., 2015; Jiraporn & Chintrakarn, 2013), we also use the quadratic term of ownership variables to account for possible non-linear relationships between ownership and ESG. Nonlinear models may help reconcile divergent findings in the literature and better capture complex relationships between variables. Also, nonlinear and piecewise linear methods have been used by several articles examining managerial ownership and company performance measures such as Tobin's Q (Cui & Mak, 2002; McConnell & Servaes, 1990; Morck et al., 1988). The regression model is defined as the following (Oh et al., 2015):

$$X_{i,t} = \beta_1 Insider_{i,t} + \beta_2 Insider_{i,t}^2 + \beta_3 Institutional_{i,t} + \beta_4 Institutional_{i,t}^2 + \beta_5 ROA_{i,t} + \beta_6 Slack_{i,t} + \beta_7 Company\ size_{i,t} + \beta_8 Company\ age_{i,t} + \beta_9 Leverage_{i,t} + \beta_{10} Tobin's\ Q_{i,t} + \beta_{11} Volatility_{i,t} + Industry\ FE + Year\ FE + Country\ FE \quad (3)$$

where X is equal to ESG score, Environment score, Social score or Governance score.

4 Main Results

4.1 Mean ESG and pillar scores by ownership subsample

Table 6 shows the distribution of ESG, ESG controversy and pillar scores for the full sample and ownership subsamples. Higher ownership concentration as well as insider ownership are associated with lower ESG scores: companies with top 5 ownership of over 50% have on average 3.7 units lower ESG scores, 2.4 units lower Environment scores, 1.7 units lower Social scores and 7.6 units lower Governance scores (statistically significant at the 1% level). Similarly, companies with insider ownership of over 20% experience the same trend. Interestingly, the negative association is largest for average Governance score in both cases.

On the other hand, institutional ownership is associated with higher Governance scores. Moreover, firms characterized by high institutional ownership exhibit smaller negative differences to sample mean in ESG, Environment, and Social scores relative to firms with high ownership concentration and insider ownership (although scores still decline as institutional ownership increases). Companies with institutional ownership of over 20% have average Governance scores 2.1 units higher than the full sample (statistically significant at the 1% level). Companies with top 5 institutional ownership over 20% have on average 1.6 units lower Environment scores and 1.9 units lower Social scores (statistically significant at the 1% level). The findings suggest an indication of a link between ownership types and ESG scores: concentrated and insider ownership are related to lower scores, particularly in governance, whereas institutional ownership is associated with less negative outcomes. However, it's crucial to note that the t-tests do not adjust for firm-specific characteristics, and therefore results may not depict the complete picture.

Despite the negative relation to overall ESG scores, ownership concentration is associated with fewer ESG related controversies. ESG controversy scores are on average 8.1 units higher for companies with top 5 ownership of over 50%. Decomposing ownership into insider and institutional shareholdings provides similar results: both types of ownership are on average associated with higher ESG controversy scores, although the effect is smaller than for the subsample of top 5 over 50%. The results are in line with large owners primarily pursuing ESG through lowering controversy as opposed to pursuing exceptionally high ESG performance. Additionally, the contrasting results for overall ESG scores and ESG controversy scores highlights the multidimensional nature of ESG as a concept.

Table 6. ESG and pillar scores by ownership subsample

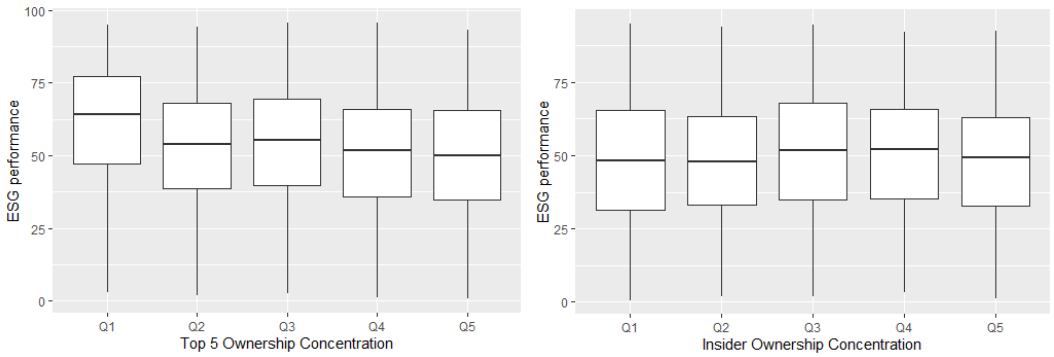
The table shows the mean of ESG score (ESG), Environment score (E), Social score (S), Governance score (G) and ESG Controversy score (ESGC) for the full sample and ownership subsamples. For ownership subsamples, shown are also the difference in means relative to the full sample and t-statistics from a Welch two sample t-test. A higher ESG, E, S or G score indicates better ESG performance, and a higher ESGC score indicates fewer controversies. We form three subsamples: 1) companies where the ownership share of the five largest shareholders is over 50%; 2) companies where the ownership share of the five largest shareholders that are insiders is over 20%; 3) companies where the ownership share of the five largest shareholders that are institutional investors is over 20%. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively

Full sample		Top5 > 0.5				Insider > 0.2				Institutional > 0.2			
N	8439	N	3119			N	2258			N	4344		
	Mean		Mean	Mean diff.	t-stat		Mean	Mean diff.	t-stat		Mean	Mean diff.	t-stat
ESG	53.5	ESG	49.9	-3.6	-8.6***	ESG	49.8	-3.7	-7.6***	ESG	52.8	-0.7	-1.9*
E	50.3	E	47.9	-2.4	-4.3***	E	48.0	-2.4	-3.7***	E	48.7	-1.6	-3.4***
S	56.5	S	54.9	-1.6	-3.3***	S	54.8	-1.7	-3.0***	S	54.6	-1.9	-4.5***
G	51.7	G	44.2	-7.5	-16.3***	G	44.1	-7.6	-14.7***	G	53.8	2.1	5.1***
ESGC	90.0	ESGC	93.5	3.5	8.1***	ESGC	92.3	2.3	4.5***	ESGC	91.3	1.3	3.2***

To examine the possibility that higher levels of ownership could lead to higher variation in ESG scores, we compare the dispersion of ESG scores between different concentrations of ownership. Figure 2 shows the 25th and 75th percentiles of ESG scores for four quartiles sorted by top 5 ownership and insider ownership, where Q1 represents the lowest ownership concentration and Q5 the highest. Overall, the height of the box plots suggests that the range of 25th-75th percentiles of ESG scores for groups divided by ownership is similar. There is therefore no supporting evidence for higher ownership concentrations leading to higher dispersions in ESG score.

Figure 2. Distribution of ESG scores by ownership concentration quartile

The figure illustrates the distribution of ESG performance scores across the top 5 and Insider concentration levels. Each box plot represents the interquartile range of its respective ownership quartile, spanning from the 25th percentile to the 75th percentile, with the median denoted by the thick horizontal line within the box. Additionally, the vertical lines extending from the boxes indicate the ranges of the sample groups.



4.2 Baseline regressions of ESG scores

Table 7 shows regressions of ESG, Environment (E), Social (S) and Governance (G) scores on ownership variables. Looking at models 1, 5, 9 and 13, we observe that higher ownership concentration is associated with lower ESG performance, consistent with H1. The coefficients on Top5 are -9.9 for ESG (statistically significant at the 1% level), -5.3 for E (statistically significant at the 5% level), -4.8 for S (statistically significant at the 5% level) and -20.7 for G (statistically significant at the 1% level). All else equal, an increase of 20 percentage points (approximately a one standard deviation increase) in the ownership share of the five largest shareholders is associated with 2.0 units lower overall ESG scores, an effect equivalent to around 10% of the sample standard deviation of ESG. The findings are in line with Dam and Scholtens (2012) who report a negative relationship between ownership concentration and CSR for European multinational firms and Ducassy and Montandrau (2015) who report a negative relation between the ownership share of the largest blockholder and CSR in a sample of French companies.

The remaining models in Table 7 show regressions with the ownership share of insider and institutional shareholders. Consistent with H2, insider ownership is associated with lower ESG scores: all coefficients on Insider are negative and statistically significant at the 1% level. All else equal, an increase of 20 percentage points (approximately a one standard deviation increase) in the ownership share of insiders is associated with 2.1 units lower overall ESG scores, an effect equivalent to around 10% of the sample standard deviation of ESG. Coefficients on Institutional are positive and significant in regressions 3, 11 and 15 of ESG, Social and Governance score and weakly statistically significant in regression 7 of Environment score, consistent with H3. However, when insider ownership is controlled for, institutional ownership is not associated with ESG scores, inconsistent with H3. This finding may explain why previous research has found mixed evidence regarding the relationship between institutional ownership and ESG, as the results may change depending on how researchers segment owners and which owners are used as a comparison group. Our results are in line with Barnea and Rubin (2010) who find a negative association between social ratings and insider ownership but no association with institutional ownership, and Rees and Rodionova (2013), who find that undiversified blockholders are associated with lower ESG performance, while diversified shareholders such as investment institutions have little or no impact on ESG. In contrast to Ducassy and Montandrau (2015) who find that owner identity does not matter, we find that both owner identity and ownership concentration matter for ESG performance, as the coefficients on Top5 and Insider are both statistically significant if included in the same model.

Table 7. Regressions of ESG scores on ownership variables

The table shows fixed effects regressions of ESG Score, Environment Score, Social Score and Governance Score on ownership and control variables. A higher ESG, E, S, or G score indicates better performance. Top5 is equal to the total ownership fraction of the five largest shareholders, Insider is equal to the ownership of insiders within the top 5 shareholders and Institutional is equal to the ownership of institutions within the top 5 shareholders. T-statistics based on robust standard errors clustered by firm are shown in parentheses. Year, country, and industry fixed effects are included in the models. Control variables ROA, Slack, Company size, Company age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Expected	ESG score				Environment score				Social score				Governance score			
	sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Top5	-	-9.93***				-5.30**				-4.80**				-20.67***			
		(-5.43)				(-2.26)				(-2.25)				(-8.29)			
Insider	-		-11.25***		-10.37***		-8.08***		-8.12***		-7.10***		-8.12***		-19.14***		-17.96***
			(-6.87)		(-5.85)		(-3.57)		(-3.31)		(-3.72)		(-3.31)		(-8.96)		(-7.71)
Institutional	+			9.78***	3.24			5.01*	-0.11			8.38***	-0.11			15.64***	4.30
				(4.20)	(1.31)			(1.69)	(-0.04)			(3.08)	(-0.04)			(4.68)	(1.23)
ROA	+/-	0.17***	0.20***	0.19***	0.20***	0.17**	0.19**	0.18**	0.19**	0.17**	0.19**	0.18**	0.19**	0.15*	0.19**	0.17**	0.19**
		(2.81)	(3.27)	(3.04)	(3.31)	(1.97)	(2.19)	(2.06)	(2.19)	(2.24)	(2.46)	(2.40)	(2.19)	(1.82)	(2.37)	(2.07)	(2.42)
Slack	+/-	0.22	-0.15	0.45	-0.05	3.09	2.81	3.20	2.81	-2.76	-3.00	-2.57	2.81	1.05	0.41	1.42	0.55
		(0.08)	(-0.06)	(0.16)	(-0.02)	(0.80)	(0.74)	(0.84)	(0.74)	(-0.80)	(-0.87)	(-0.74)	(0.74)	(0.29)	(0.11)	(0.39)	(0.15)
Company size	+	8.46***	8.56***	8.75***	8.60***	10.08***	10.11***	10.23***	10.11***	8.81***	8.84***	8.98***	10.11***	6.18***	6.43***	6.75***	6.48***
		(33.05)	(34.82)	(35.28)	(34.60)	(31.14)	(32.36)	(32.88)	(32.11)	(29.59)	(30.66)	(31.49)	(32.11)	(18.26)	(19.10)	(19.46)	(19.11)
Company age	+	0.08***	0.08***	0.09***	0.09***	0.11***	0.11***	0.11***	0.11***	0.09***	0.09***	0.10***	0.11***	0.03	0.04	0.04	0.04
		(3.59)	(3.83)	(3.81)	(3.85)	(3.38)	(3.46)	(3.45)	(3.46)	(3.60)	(3.70)	(3.74)	(3.46)	(0.92)	(1.25)	(1.25)	(1.26)
Leverage	+/-	3.50	3.72	3.48	3.56	2.62	2.67	2.62	2.68	6.68**	6.74**	6.46**	2.68	-0.44	0.16	-0.19	-0.06
		(1.37)	(1.47)	(1.35)	(1.40)	(0.74)	(0.76)	(0.74)	(0.76)	(2.12)	(2.14)	(2.04)	(0.76)	(-0.14)	(0.05)	(-0.06)	(-0.02)
Tobin's Q	+/-	1.02	1.11*	1.14*	1.13*	0.72	0.77	0.79	0.77	1.96***	2.01***	2.04***	0.77	0.51	0.68	0.73	0.71
		(1.64)	(1.82)	(1.83)	(1.85)	(0.88)	(0.95)	(0.96)	(0.95)	(2.68)	(2.76)	(2.79)	(0.95)	(0.66)	(0.90)	(0.93)	(0.94)
Volatility	+/-	-0.02	-0.03	-0.06	-0.03	-0.11	-0.11	-0.13	-0.11	-0.19*	-0.19*	-0.21*	-0.11	0.18	0.16	0.11	0.15
		(-0.23)	(-0.29)	(-0.62)	(-0.33)	(-0.90)	(-0.89)	(-1.04)	(-0.89)	(-1.77)	(-1.77)	(-1.95)	(-0.89)	(1.59)	(1.41)	(0.96)	(1.37)
Year fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439
Adjusted R^2		0.54	0.55	0.54	0.55	0.52	0.52	0.52	0.52	0.49	0.49	0.49	0.52	0.26	0.26	0.24	0.26

Next, we examine the relation between ESG controversy scores and ownership. As stated in Hypothesis 6, we would expect there to be no significant relation of ownership to ESG controversy score, as it is in the best interest of everyone to minimize controversies due to all stakeholders experiencing the more direct negative impact of controversies to firm performance.

In Table 8, we regress ESG controversy scores on Top5, insider, and institutional ownership. Contradicting our expectation, we observe a positive significant relationship between overall ownership concentration, as measured by Top5, and the ESG controversy score, indicating fewer controversies. An increase in Top5 of 20 percentage points (approximately one standard deviation) is associated with 1.5 units higher ESG controversy scores, an effect equivalent to around 6% of the sample standard deviation. One interpretation of the results may be that larger owners have more incentive to monitor the company and make sure controversies are avoided, as they have more wealth at stake to lose to controversies, or that controversies can directly impact their personal reputation negatively. However, when decomposing ownership to insider and institutional ownership, no association between ownership and ESG controversies are observed. This suggests that neither insider nor institutional ownership significantly relates to the occurrence of controversies, supporting our hypothesis that the identity of the owners should not matter for matters that benefit all stakeholders.

Table 8. Regressions of ESG controversy scores

The table shows fixed effects regressions of ESG controversy score on ownership and control variables. A higher score indicates better performance (fewer ESG related controversies). The controversy score is 100 when no have occurred during the year, and less than 100 otherwise depending on the magnitude of the controversy. Top5 is equal to the ownership share of the five largest shareholders, Insider is equal to the ownership of insiders within the top 5 shareholders and Institutional is equal to the ownership of institutions within the top 5 shareholders. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Control variables ROA, Slack, Company Size, Company Age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile

	Expected sign	ESG controversy score (1)	(2)	(3)	(4)
Top5	+/-	7.26***			
		(3.27)			
Insider	+/-		1.77		2.40
			(1.00)		(1.24)
Institutional	+/-			0.78	2.29
				(0.34)	(0.91)
ROA	+/-	0.03	0.03	0.03	0.03
		(0.49)	(0.44)	(0.51)	(0.47)
Slack	+/-	-4.22	-4.17	-4.21	-4.09
		(-1.54)	(-1.51)	(-1.53)	(-1.48)
Company size	+/-	-6.22***	-6.36***	-6.37***	-6.33***
		(-15.50)	(-15.61)	(-15.79)	(-15.71)
Company age	+/-	-0.02	-0.02	-0.02	-0.02
		(-0.79)	(-0.92)	(-0.91)	(-0.90)
Leverage	+/-	10.85***	10.48***	10.38***	10.37***
		(3.89)	(3.76)	(3.75)	(3.75)
Tobin's Q	+/-	1.53**	1.49**	1.50**	1.50**
		(2.48)	(2.39)	(2.40)	(2.41)
Volatility	+/-	-0.33***	-0.32***	-0.31***	-0.32***
		(-3.13)	(-2.93)	(-2.90)	(-2.96)
Year fixed effects		Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes
Observations		8,439	8,439	8,439	8,439
Adjusted R^2		0.24	0.24	0.24	0.24

4.3 Nonlinear regressions of ESG scores

Our results in the previous section raise questions on whether the observed negative association of insider owners and mixed evidence regarding institutional investors respectively remain consistent across varying levels of ownership concentration, or if the relationships differ depending on the degree of ownership.

Table 9 shows regression models including top 5 insider and institutional ownership and their squared terms. Results imply that dispersed and highly concentrated insider ownership are, in general, associated with better performance in total ESG and Social, as the linear and squared term are both statistically significant in Models 1 and 3. This is consistent with H4, which predicts a U-shaped relationship between insider ownership and ESG. In contrast, the Environmental

and Governance pillar do not show the same pattern for insider ownership, as only the linear term is statistically significant. For institutional ownership, moderately dispersed ownership is associated with higher total ESG, Social and Governance performance, as the squared term is significantly negative (with the linear term also being significant). The findings are consistent with H5, which predicts an inverted U-shaped relationship between institutional ownership and ESG. No non-linear or linear association is found for Environment score, as both coefficients are insignificant, inconsistent with H5. It is worth noting, that the adjusted R-squared of the models do not increase significantly relative to the models with only linear terms (regressions 4, 8, 12 and 16 in Table 7), indicating that the nonlinear model does not significantly increase the explanatory power of the model.

Further analysis of the negative relationship between insider ownership and ESG performance reveals that this association is particularly strong in the Environment and Governance pillars. Figure 3 illustrates this by displaying plots of the predicted ESG, Environment, Social, and Governance scores across different levels of insider ownership, based on the models presented in Table 9. Environmental performance shows a downward sloping trend with a slight uplift only at very high levels of insider ownership (Insider > 60%), and similarly, Governance performance appears to decrease linearly with insider ownership. In contrast, social performance exhibits the clearest U-shaped relationship: at low to moderate levels of insider ownership, Social scores decrease, but at high levels, scores increase with insider ownership. Taken together, insider ownership is linked to lower Environmental and Governance performance; however, Social performance is higher in companies where insiders are in control and lower in firms where insiders are large but non-controlling shareholders. The results are partially in line with Oh et al. (2015), who find that CSR strengths scores decrease with insider ownership up to a point after which they increase with insider ownership. In contrast to Oh et al. (2015) however, we find a more muted positive effect from the squared term, indicating that ESG scores decrease at a decreasing rate with insider ownership, but scores are still lower than average even in firms with very high levels of insider ownership.

Similarly, Figure 4 presents an additional breakdown of the individual dimensions, showing the expected values of ESG, Environment, Social, and Governance scores for different levels of institutional ownership, as predicted by the models in Table 9. In general, combined ESG scores exhibit an inverted U-shaped relationship: ESG scores increase at low levels of institutional ownership and decrease at high levels. The effect seems to be driven most by the Governance along with the Social dimensions, due to their clear concave shapes. Meanwhile, Environment scores are not associated with the level of institutional ownership, as demonstrated by a flat line. Although the signs of the linear and squared term for ESG scores are in line with Oh et al. (2015), our interpretation differs: the authors find that CSR strengths scores increase at a decreasing rate with institutional ownership, however we observe only a slightly positive association at low levels

of institutional ownership and a negative association at high levels. The finding is in line with previous research indicating a negative relationship between high institutional blockholding and ESG scores (Gloßner, 2019).

Table 9. Regressions of ESG scores with squared terms of ownership variables

The table shows fixed effects regressions of ESG score (ESG), Environment score (E), Social score (S) and Governance score (G) on ownership variables. A higher ESG score indicates better performance. Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Expected sign	ESG score (1)	Environment score (2)	Social score (3)	Governance score (4)
Insider	-	-18.57***	-17.16***	-16.86***	-18.19***
		(-3.76)	(-2.62)	(-2.87)	(-2.85)
Insider^2	+	14.60**	14.08	18.54**	4.63
		(2.00)	(1.55)	(2.16)	(0.50)
Institutional	+	20.36***	0.43	17.62**	43.40***
		(3.22)	(0.05)	(2.52)	(4.89)
Institutional^2	-	-28.12***	-1.47	-21.51**	-62.98***
		(-2.94)	(-0.13)	(-1.97)	(-5.09)
Controls		Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes
Observations		8,439	8,439	8,439	8,439
Adjusted R^2		0.55	0.52	0.50	0.27

Figure 3. Predicted values of ESG, E, S and G by insider ownership

The figure illustrates the predicted values ESG score (ESG), Environment score (E), Social score (S) and Governance score (G) from Table 9 plotted against insider ownership within the five largest shareholders. Other variables are kept at their mean or mode level. Confidence intervals for a confidence level of 0.95 are included and the distribution of the original data is displayed along the axes.

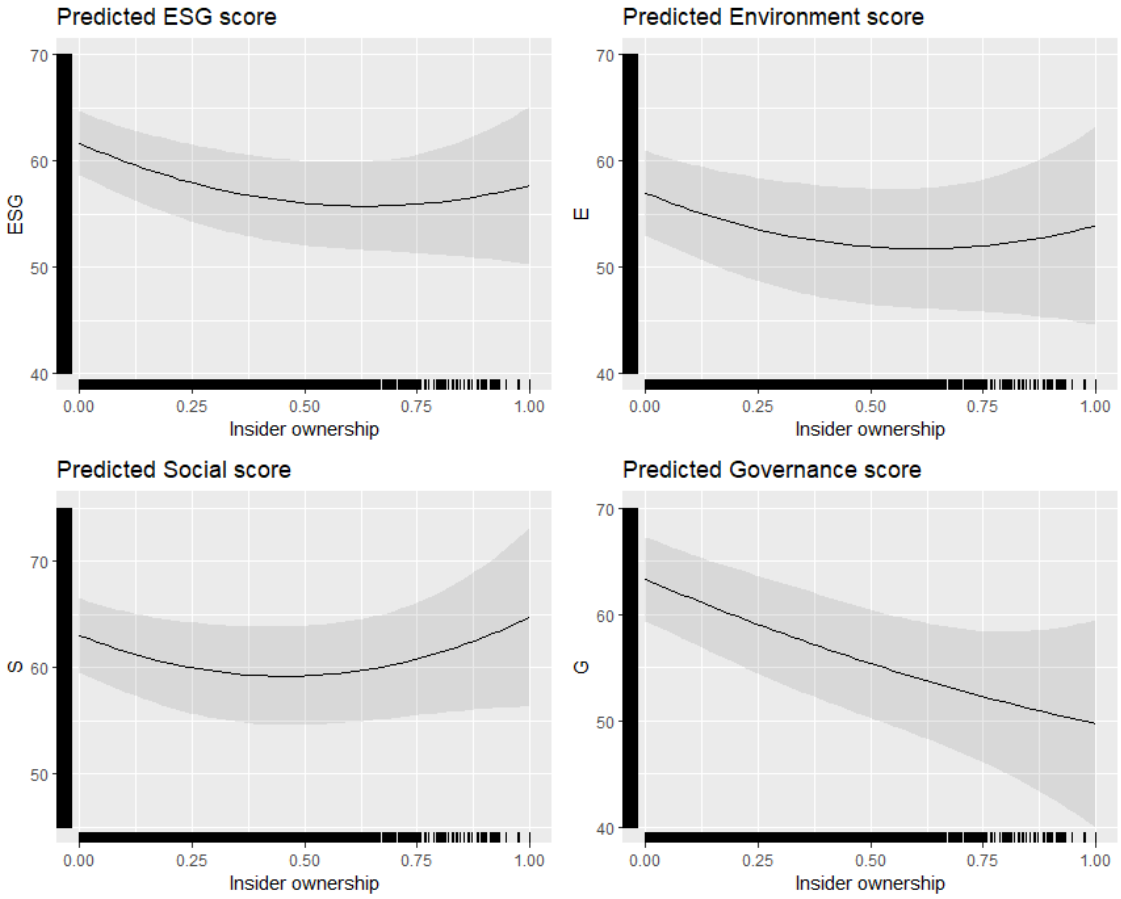
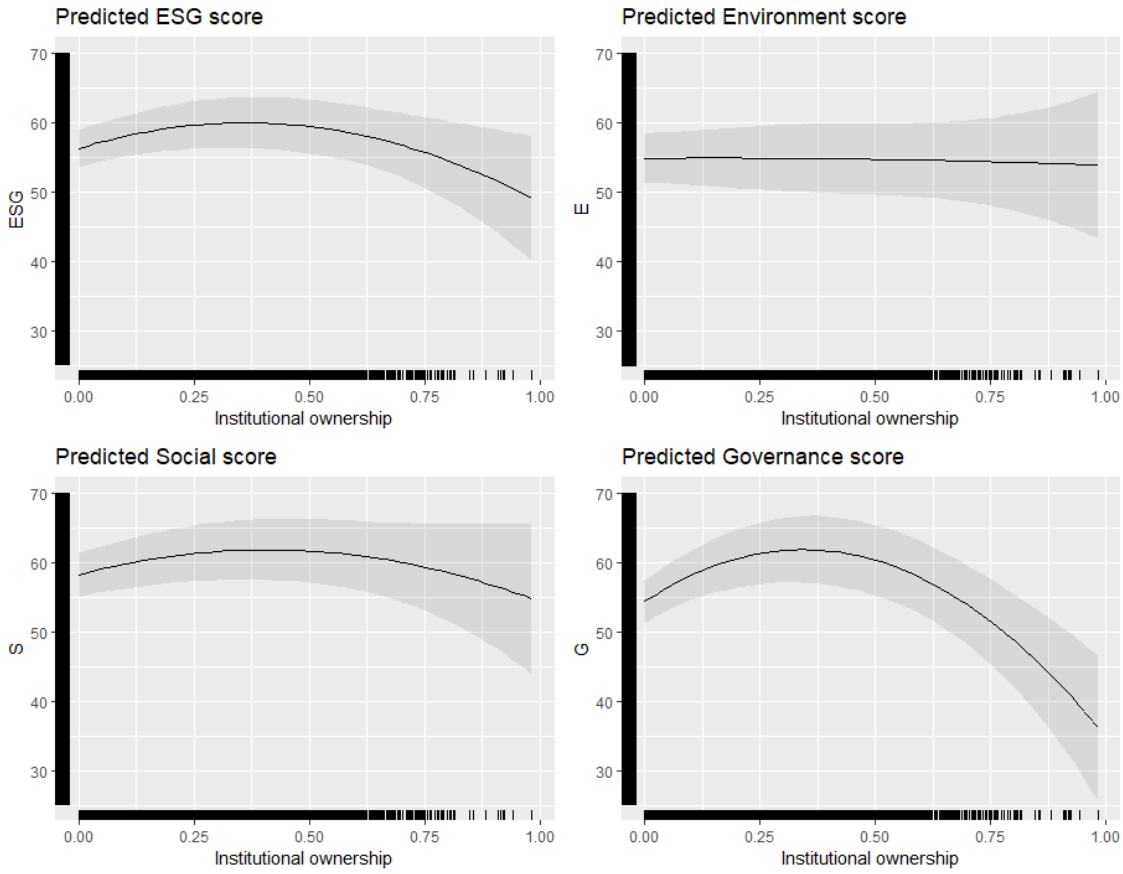


Figure 4. Predicted values of ESG, E, S and G by institutional ownership

The figure illustrates the predicted values ESG score (ESG), Environment score (E), Social score (S) and Governance score (G) from Table 9 plotted against institutional ownership within the five largest shareholders. Other variables are kept at their mean or mode level. Confidence intervals for a confidence level of 0.95 are included and the distribution of the original data is displayed along the axes.



4.4 Discussion and summary of main findings

In this section, we summarize our main findings. Table 10 provides a summary of our main results and hypotheses for overall ESG and ESG controversy scores.

Our linear analyses suggest that owner identity and ownership concentration may both be important factors within ESG performance, possibly due to ESG commitments bearing asymmetric effects for different stakeholders—for example when additional ESG investments conflict with owner wealth and owners are undiversified. We find a significant negative association between ownership concentration and ESG scores as well as insider ownership and ESG scores, consistent with H1 and H2. The negative relationship between large blockholders and insiders with ESG align with theories proposed in previous literature: large blockholders disproportionately bear the costs of excessive ESG investments, and insiders prioritize financial returns due to their lack of diversification, possibly resulting in resisting ESG investments. Further, we find that the negative association between ownership concentration and ESG are mainly driven by insider investors. This result provides stronger evidence for the entrenchment effect of insiders and H2. In contrast, we find no association between institutional ownership and ESG scores when controlling for insider ownership, a result inconsistent with H3. All-in-all, the results from the linear analysis give support for existence of distinct goals, motivations, and preferences of shareholder types in relation to ESG, consistent with agency theory.

Motivated by diverging findings in previous literature, we additionally explore the role of nonlinear links in the ownership-ESG context. Specifically, we examine how the connection to ESG might shift depending on whether insider and institutional investors have lower or higher stakes in a company. Our analysis reveals non-linear relationships for both insider and institutional investors. In line with H4, we find a convex relationship between insider ownership and ESG: ESG scores decrease with insider ownership at a decreasing rate, with a positive relationship at high levels of insider ownership. Consistent with H5, we find a concave relationship between institutional ownership and ESG: ESG scores increase with institutional ownership at low levels but decrease at high levels of institutional ownership. While insiders may decrease ESG due to bearing more of the costs, when holding a controlling stake, they might be more inclined to pursue ESG because their reputation and wealth is increasingly aligned with the company (Gugler et al., 2006; Jensen and Meckling, 1976), creating a positive offsetting force at high levels of insider control. On the other hand, institutional investors may generally encourage companies to pursue ESG at higher rates than insiders due to regulatory pressure or for risk mitigation benefits (Fu et al., 2019; Nguyen et al. 2020) but at sufficiently high levels of control, they may resist overinvestment in ESG due to the costs associated with it.

Additionally, our analysis suggests that the relationship between ownership characteristics and ESG is different for ESG controversies – a measure with a more direct link to financial performance. While both owner identity and

ownership concentration matter for ESG performance, when looking at ESG controversies, owner identity appears irrelevant. This may be due to ESG controversies being universally undesirable, making insiders and institutional owners equally motivated to prevent them. However, concentrated ownership shows a positive significant correlation with fewer controversies, likely because both financial and reputational repercussions of controversies weigh heavily on major owners, suggesting that concentrated owners may engage in more effective monitoring.

Lastly, the relationship between ownership and ESG differs by the dimension of ESG. We find a negative relationship between insider ownership and environmental performance while social performance has a U-shaped relationship. The finding may be explained by differing implications for the firm depending on which dimension of ESG is considered. For example, environmental aspects, such as emissions reduction, may be more likely to benefit society as a whole and offer fewer direct benefits for the company, while social responsibility includes aspects such as employee relations and product responsibility that may be more in line with company performance (Rees and Rodionova, 2013). Under this view, insiders may be more willing to invest in certain types of ESG while resisting other types.

The effects we find for ownership characteristics on ESG performance neither very large nor meaningless: a one standard deviation increase in ownership concentration/insider ownership is associated with a decrease in ESG equivalent to 10% of the sample standard deviation and an increase in ESG controversy scores equivalent to 6% of the sample standard deviation. The explanatory power of our baseline regressions of ESG scores (models 1-4 in Table 7) as well as Environment and Social pillar scores is relatively high, with adjusted R-squared of over 0.5. This indicates that our model is able to explain a large proportion of the variation in ESG performance. However, explanatory power is much lower for models of ESG controversy scores (Table 8) and Governance scores (models 13-16 in Table 7), with adjusted R-squared of around 0.25, indicating that factors outside our models may be at play. Relative to models with only control variables, adding ownership variables increases adjusted R-squared by around 0.01-0.02 units, indicating that while ownership characteristics have a statistically significant relation to the level of ESG, they explain a relatively low proportion of the variation. Adding squared terms of insider and institutional ownership does not change the adjusted R-squared of the models, indicating that a nonlinear model may describe the relationship between ownership and ESG better than the linear model but not significantly so.

Table 10. Summary of main regression results

The table summarizes our main analysis results. Hypotheses are defined as the following: H1: Ownership concentration is negatively associated with ESG performance.; H2: Insider ownership is negatively associated with ESG performance.; H3: Institutional ownership is positively associated with ESG performance.; H4: There is a convex (U-shaped) relationship between insider ownership and ESG performance.; H5: There is a concave (inverted U-shaped) relationship between institutional ownership and ESG performance.; H6: There is no association between ownership and ESG controversies.

Dependent variable: ESG score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	-	-	H1	Yes
Insider	-	-	H2	Yes
Institutional	+	0	H3	No
Insider / Insider^2	- / +	- / +	H4	Yes
Institutional / Institutional^2	+ / -	+ / -	H5	Yes
Dependent variable: ESG controversy score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	0	+	H6	No
Insider	0	0	H6	Yes
Institutional	0	0	H6	Yes

5 Additional analyses

Given our baseline analysis, which establishes an association between ownership concentration, owner type, and ESG performance, we are motivated to further analyze the possible mechanisms underlying this relation. Firstly, due to changes in regulation during the last 10 years (NFRD, CSRD, MiFID II), we want to see whether the relationship between ownership characteristics and ESG scores has changed over time. To provide additional evidence regarding the relation between insider ownership and ESG, we also explore the moderating roles of financial resource availability and executive incentives, as both the level of financial resources available in a company for ESG pursuits and the incentive systems in place for key management may interact with the way owners shape ESG.

5.1 Regressions of year subsamples

To evaluate changes in the relationship between ownership characteristics and ESG over time, we split our sample into four subsamples based on the year of observation. The first subsample contains observations with the year of observation below or equal to the first quartile value of the Year-variable, the second contains observations above the first quartile and below or equal to the second quartile and so on. The analysis is repeated for subsamples using regression models 1 and 2 defined in Section 3. Results for the regressions of ESG, Environment and Social score for the year subsamples are shown in Table 11. It is important to note that although the sample is divided into quartiles, the last two quartiles (2019-2020 and 2021-2022) cover only two years each, yet they contain as many observations as the earlier quartiles (2002-2013 and 2014-2018). Therefore, while these groupings are not perfectly comparable as the first two samples contain more time series evidence and the two latter more cross sectional evidence, they still illustrate the evolving trend over time.

The relationship between concentrated ownership and ESG scores appears to have become more negative over time, demonstrated by more negative regression coefficients on top 5 in later subsamples. On the other hand, the relationship between insider ownership and ESG has become less negative over time, with the latest subsample showing no association between insider ownership and Environment scores and only weak evidence for a negative association with Social scores. Similarly, the relationship between institutional ownership and ESG scores appears to have changed over time: while institutional ownership is not associated with ESG scores in the first two subsamples, we observe a positive relationship between the two in the latest subsample. One possible reason for the less negative relationship between insider owners and ESG performance or positive significant relationship between institutional owners and ESG performance in recent years, particularly 2021-2022, could be the growing significance of ESG legislation. This is especially relevant for institutional investors, who are increasingly evaluated based on the corporate social responsibility of their portfolios.

Insiders might also be cautious about excessively downgrading ESG due to potential reputational consequences. However, firms with large owners still show poorer ESG performance compared to others when comparing the latest sample to the earliest, possibly suggesting that fundamental agency issues continue to persist throughout time periods. Overall, the analysis provides evidence for the changing nature of the interaction between firms' ownership structure and ESG performance.

Table 11. Regressions by year subsample

The table shows fixed effects regressions of ESG score (ESG), Environment score (E) and Social score (S) by year subsample. Subsamples are formed based on the quartiles of the Year-variable. A higher ESG score indicates better performance. Top5 is equal to the ownership fraction of the five largest shareholders, Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

		Dependent variable: ESG score							
	Expected sign	2002-2013		2014-2018		2019-2020		2021-2022	
Top5	-	-7.59**		-10.96***		-10.70***		-11.96***	
		(-2.43)		(-4.04)		(-4.78)		(-5.41)	
Insider	-		-13.91***		-14.24***		-9.27***		-7.24***
			(-3.71)		(-5.23)		(-4.65)		(-3.67)
Institutional	+		-3.20		2.02		6.37*		6.53**
			(-0.76)		(0.48)		(1.93)		(2.27)
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		2,427	2,427	2,297	2,297	1,721	1,721	1,994	1,994
Adjusted R^2		0.53	0.53	0.49	0.51	0.59	0.60	0.58	0.58

		Dependent variable: Environment score							
	Expected sign	2002-2013		2014-2018		2019-2020		2021-2022	
Top5	-	-3.94		-5.14		-5.96**		-6.58**	
		(-1.01)		(-1.38)		(-2.05)		(-2.47)	
Insider	-		-13.19***		-12.34***		-6.84***		-3.11
			(-2.78)		(-3.09)		(-2.59)		(-1.29)
Institutional	+		-4.94		-0.88		0.85		3.70
			(-0.93)		(-0.17)		(0.20)		(1.04)
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		2,427	2,427	2,297	2,297	1,721	1,721	1,994	1,994
Adjusted R^2		0.53	0.54	0.49	0.50	0.56	0.56	0.55	0.54

		Dependent variable: Social score							
	Expected sign	2002-2013		2014-2018		2019-2020		2021-2022	
Top5	-	-4.06		-5.65*		-4.60*		-7.15***	
		(-1.07)		(-1.75)		(-1.81)		(-2.91)	
Insider	-		-10.88**		-9.96***		-2.82		-4.17*
			(-2.50)		(-3.03)		(-1.20)		(-1.80)
Institutional	+		-3.74		3.04		11.74***		7.37**
			(-0.71)		(0.63)		(3.16)		(2.24)
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations		2,427	2,427	2,297	2,297	1,721	1,721	1,994	1,994
Adjusted R^2		0.46	0.46	0.44	0.45	0.55	0.56	0.56	0.57

5.2 The moderating role of financial resources

Next, we investigate the role of financial resource availability following Hettler et al. (2021). The authors find that the negative association between excess insider ownership and CSR is neutralized at high levels of financial resources, indicating that when financial resources are low, companies with higher excess insider control decrease CSR more than companies with lower excess insider control. We construct three additional variables following Hettler et al. (2021): CashQ4, OCFQ4 and FCFQ4. CashQ4 is equal to one if the cash and cash equivalents divided by total assets is in the top quartile of observations, OCFQ4 is equal to one if the operating cash flow divided by total assets (OCF) is in the top quartile of observations and FCFQ4 is equal to one if the free cash flow (FCF, proxied by OCF less capex) divided by total assets is in the top quartile of observations. The data is sourced from LSEG. We define the following regression model

$$\begin{aligned} ESG_{i,t} = {} & \beta_1 Insider_{i,t} + \beta_2 Institutional_{i,t} + \beta_3 Y_{i,t} + \beta_4 Y_{i,t} \cdot Insider_{i,t} \\ & + \beta_5 ROA_{i,t} + \beta_6 Company\ size_{i,t} + \beta_7 Company\ age_{i,t} \\ & + \beta_8 Leverage_{i,t} + \beta_9 Tobin's\ Q_{i,t} + \beta_{10} Volatility_{i,t} \\ & + Industry\ FE + Year\ FE + Country\ FE \end{aligned} \quad (4)$$

where Y is equal to CashQ4, OCFQ4 and FCFQ4.

The results are reported in Table 12. We find evidence of a positive relationship between ESG performance and high financial resource availability as measured by CashQ4 and OCFQ4. However, in contrast to Hettler et al. (2021), we find no evidence of financial resources acting as a moderator in the negative relationship between insider ownership and ESG scores. This indicates that ESG performance is lower for companies with high insider ownership even if the company has a high level of financial resources available, and that insiders do not appear to decrease ESG activities due to a lack of financial resources. The divergence from Hettler et al. (2021) may stem from their focus on excess insider control and emphasis on insiders in dual-class firms, where the entrenchment effect may be further amplified by greater voting rights attached to insider shares. Alternatively, their study drawing on U.S. data may experience varied dynamics between owner identity and ESG performance compared to the regions in our dataset which are influenced by EU ESG legislation.

Table 12. Moderating role of financial resource availability

The table shows fixed effects regressions of ESG, Environment (E) and Social (S) score on ownership variables and indicator variables for high financial resource availability. A higher ESG, E or S score indicates better performance. Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. CashQ4, OCFQ4 and FCFQ4 are indicator variables equal to one if the observation is in the top quartile of cash and cash equivalents scaled by total assets, operating cash flow scaled by total assets or free cash flow scaled by total assets, respectively. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	ESG score		
	(1)	(2)	(3)
Insider	-10.59***	-10.31***	-10.46***
	(-5.46)	(-5.22)	(-5.43)
Institutional	3.06	3.50	3.34
	(1.22)	(1.40)	(1.35)
CashQ4	1.99**		
	(1.96)		
OCFQ4		1.98**	
		(2.57)	
FCFQ4			0.49
			(0.65)
Insider:CashQ4	1.35		
	(0.43)		
Insider:OCFQ4		-0.30	
		(-0.12)	
Insider:FCFQ4			0.48
			(0.20)
Controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	8,408	8,425	8,422
Adjusted R^2	0.55	0.55	0.55

5.3 The moderating role of executive incentives

In addition to shareholder dynamics, company management has a significant amount of influence in shaping a company's ESG strategy, motivating us to study the interactions between company owners and executive incentives. It has been theorized that outside monitoring can mitigate agency issues, resulting in reduced entrenchment and personal gain extraction by insiders (Berle and Means, 1968). Additionally, incentives can be utilized to align stakeholder interests, thereby enhancing corporate governance (Cohen et al., 2023). Following this, we aim to understand how ESG-based management incentives, the use of long-term performance targets and differing financial incentives influence the relationship between ownership and ESG. Specifically, we aim to understand whether differences in executive incentives contribute to or mitigate the negative relationship between ESG and insider ownership.

ESG-based compensation in corporate structures can promote the internalization of corporate social responsibility dimensions that can traditionally be neglected because of the external costs associated with them (Cohen et al., 2023). ESG pay has also been linked to motivating managers towards long-term orientation (Flammer et al., 2019; Qin & Yang 2022), increasing a firm's social and environmental initiatives and reducing emissions (Flammer et al., 2019), decreasing earnings manipulation (Khenissi et al., 2022), and increasing ESG performance (Cohen et al., 2023). In the context of insider control, these types of incentives could be more effective, because they add an extra layer of procedure and structure to the operation of managers, which could reduce entrenchment, decrease the role of informal decisions or better align actions with company strategy. On the other hand, it has been suggested that ESG compensation may also be a way for firms to mask excess executive pay, as it is not directly performance-related (Gosling & O'Connor, 2021; Keddie & Magnan, 2023). ESG incentives could therefore also be used by insiders as a way to increase private benefits, making incentives less effective in promoting ESG in companies with high insider control.

In turn, financial incentives, especially short-term ones, may be a competing priority for executives. Homroy et al. (2023) finds that the likelihood of meeting ESG targets for CEOs is negatively correlated with meeting financial goals. The existence of managerial financial incentives has been found to have a negative association with a firm's ESG performance, indicating that when managers are strongly motivated to maximize firm value, they pay less attention to ESG (Jang et al., 2022). In contrast, long-term incentives, such as higher share of equity-based compensation, as opposed to cash-based, has been found to be positively associated with ESG, with results being more pronounced for firms with higher levels of insider ownership (Karim et al., 2018), possibly suggesting that long-term compensation may be more beneficial to ESG outcomes than short-term compensation. The way ownership characteristics interact with ESG performance may therefore be impacted by the financial incentives that management has.

To test whether and to what extent executive incentives impact the relationship between ownership characteristics and ESG, we define four variables based on Refinitiv LSEG data: ESG Incentives (indicator variable equal to one if the company has an extra-financial compensation policy), Long-Term Incentives (indicator variable equal to one if management compensation is linked to objectives which are at least two years forward looking), Senior Executive Compensation (indicator variable equal to one if the observation is in the top quartile of senior executives compensation scaled by revenue in thousand), and CEO Compensation linked to TSR (an indicator variable equal to one if the CEO's compensation is linked to the total shareholder return). We define the following regression model:

$$ESG_{i,t} = \beta_1 Insider_{i,t} + \beta_2 Institutional_{i,t} + \beta_3 Y_{i,t} + \beta_4 Y_{i,t} \cdot Insider_{i,t} + \beta_5 ROA_{i,t} + \beta_6 Slack_{i,t} + \beta_7 Company\ size_{i,t} + \beta_8 Company\ age_{i,t} + \beta_9 Leverage_{i,t} + \beta_{10} Tobin's\ Q_{i,t} + \beta_{11} Volatility_{i,t} + Industry\ FE + Year\ FE + Country\ FE \quad (5)$$

where Y is equal to ESG Incentives, Long-Term Incentives, Total Senior Executive Compensation or CEO compensation linked to TSR.

The results are shown in Table 13. In line with earlier results, all regression coefficients on insider ownership are negative and statistically significant, indicating that differences in executive incentives do not explain away the negative relation. We find that the use of ESG incentives in executive compensation as well as CEO pay linked to the total shareholder return are associated with higher ESG performance, all else equal. We find a weakly statistically significant negative relation between executive compensation and ESG scores but no association between long-term incentives and ESG scores, although the latter result may be explained by a low number of observations of companies using long-term incentives. We find no moderating effects between insider ownership and incentive variables, indicating that ownership structure has a similar effect on ESG performance irrespective of executive incentives: the presence of ESG incentives or long-term incentives, the level of executive compensation or linking CEO pay to a long-term measure like total shareholder return neither mitigate or exacerbate the negative association between concentrated/insider ownership and ESG.

The results could be explained by the adoption or quality of ESG incentives being correlated with owner concentration and identity. Specifically, companies with concentrated and insider ownership seem to be generally less likely to implement high-quality ESG incentives, as shown in Appendix 7. On the other hand, institutional ownership is significantly positively associated with both the presence and quality of ESG incentives, possibly due to the increased monitoring pressure they place on boards (Fama, 1980; Shleifer & Vishny, 1986). Owners may therefore influence what types of incentive systems are established in the first place, which may explain why the analysis does not yield meaningful results.

Table 13. Insider ownership and moderating effects of ESG and financial incentives

The table shows fixed effects regressions of ESG score on ESG incentive, executive compensation and owner-ship variables. Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. ESG Incentives is an indicator variable equal to one if the company has an extra-financial compensation policy, Long-Term Incentives is an indicator variable equal to one if management compensation is linked to objectives which are at least two years forward looking, Senior Executive Compensation is an indicator variable equal to one if the observation is in the top quartile of senior executives compensation scaled by revenue in thousand, and CEO Compensation linked to TSR is an indicator variable equal to one if the CEO's compensation is linked to the total shareholder return. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	ESG score			
	(1)	(2)	(3)	(4)
Insider	-9.27***	-10.60***	-11.09***	-8.55***
	(-4.30)	(-5.94)	(-5.53)	(-3.74)
Institutional	2.59	3.24	2.44	2.31
	(1.06)	(1.31)	(0.97)	(0.96)
ESG Incentives	7.70***			
	(9.60)			
Long-Term Incentives		-1.63		
		(-1.10)		
Senior Executive Compensation			-1.80*	
			(-1.96)	
CEO Compensation linked to TSR				7.71***
				(9.30)
Insider: ESG Incentives	1.34			
	(0.53)			
Insider: Long-Term Incentives		7.34		
		(1.00)		
Insider: Total Senior Executive Compensation			1.66	
			(0.57)	
Insider: CEO Compensation linked to TSR				-1.54
				(-0.59)
Controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	8,439	8,439	7,928	8,439
Adjusted R^2	0.58	0.55	0.55	0.57

6 Robustness checks

We perform several tests to check the robustness of our results. First, we recreate our main regressions using alternative ESG scores from MSCI as the dependent variable (see Appendix 1). Our takeaways from the main analysis are similar: there is a negative relationship between overall ownership concentration and ESG as well as insider ownership and ESG, meanwhile institutional ownership overall is not associated with the level of ESG. Looking at the ESG pillars separately, however, there is no relation between ownership concentration or insider ownership with social performance. Unlike our main analysis, we also find a positive relationship between institutional ownership and governance scores even after controlling for insider ownership. Lastly, the evidence for a nonlinear relationship between ownership and ESG is much weaker for insiders and virtually non-existent for institutional ownership. This could be driven by the smaller sample size of 4,598 firm-year observations, two times smaller than the original sample.

We also check for multicollinearity and heteroscedasticity in our models. To estimate the impact of multicollinearity between variables, we calculate the Variance inflation factors (VIF) for all explanatory variables (Table 14) used in models 1 (Top5) and 2 (Insider and institutional). Typically, a VIF of below 5 is interpreted as low correlation of a predictor with other predictor variables. In our models, the VIFs range between 1.2 and 1.8, indicating low multicollinearity. To test for heteroskedasticity in our models, we perform the Breusch-Pagan test, rejecting the null hypothesis of homoskedasticity. Accordingly, we use robust standard errors in all our regression models.

Additionally, we split our sample into subsamples by country to explore the possibility that results differ by region (see Appendix 2 and 3). Looking at the country subsample regressions, it can be seen that our results are mainly driven by the UK, which accounts for over 40% of the observations in the sample. Ownership concentration is negatively associated with ESG scores in the UK, Germany and France but not associated in Italy, Spain and the Netherlands. Similarly, a negative relation between insider ownership and ESG is observed in the UK, Germany, France and the Netherlands while in Spain and Italy, no association is observed. For the ESG sub-pillars, the negative relationship is most robust between insider ownership and governance, while a negative relationship with environment or social pillars is only observed in the UK and Netherlands and not the other sample countries. Similarly, evidence for a nonlinear association between ownership and ESG is only observed in the UK subsample, with other country subsamples showing coefficients which are mostly not statistically significant.

To explore robustness over time, we also split our sample into four subsamples by year (See Appendix 4 and 5). As covered in Section 5.1, the association between concentrated/insider ownership and ESG scores is negative in all time periods, however institutional ownership has a positive association with ESG scores in the later sample years 2019-2022. Additionally, evidence for a nonlinear association

is only present in the later sample years 2019-2022, possibly due to a larger number of cross-sectional observations compared to earlier sample years as opposed to time series evidence.

We also split our sample in two based on governance score motivated by Jian and Lee (2014) who find a negative association between CEO compensation and CSR that is more pronounced in better-governed firms. The results are shown in Appendix 6. The relationship between insider ownership and ESG scores is negative in both subsamples. In regressions of environment score, the coefficient on insider is negative and statistically significant in the low governance subsample but only weakly statistically significant in the high governance subsample. Coefficients on insider in regressions of social score are not statistically significant in the subsample regressions. Similar to our main analysis, coefficients on institutional ownership are not statistically significant.

Lastly, to give additional evidence considering potential endogeneity issues and reverse causality, we also perform regressions using first differences with lagged explanatory variables. The methodology follows Fahlenbrach and Stulz (2009), however we look at different variables and define large changes in ownership as changes over 5 percentage points. Table 15 shows regressions of changes in ESG performance on lagged changes in top 5, insider and institutional ownership and Table 16 shows regressions of changes in ESG scores on lagged increases and decreases of over 5 percentage points in top 5, insider and institutional ownership. The explanatory power of the models is relatively low, with adjusted R-squared measures of around 0.02, and relatively few of the model coefficients on ownership variables are statistically significant. We find no association between lagged changes in ownership variables and changes in overall ESG scores. Looking at regressions of pillar scores provides evidence partly in conflict with previous findings, with indications of a positive relationship between ownership concentration and social performance, a negative relation between ownership concentration and governance scores and a negative relationship between institutional ownership and governance scores. The mixed evidence provided by the analysis may in part be explained by nonlinear effects, which the model does not account for as the starting level of ownership is not included in the model, or differences between owners within the institutional or insider ownership categories. However, the limited and in part conflicting evidence provided by the analysis also highlights that endogeneity of ownership and reverse causality are likely to be contributing to our results, as is typical in the ownership-company performance context (see e.g. Demsetz & Villalonga, 2001).

To summarize, we find a negative relationship between concentrated ownership and ESG scores and insider ownership and ESG scores that is robust against an alternative ESG score data source, present in subsamples across time and observed in around half of the sample countries when looked at individually. Although we found no association between institutional ownership and ESG scores in our main analysis, when using MSCI ESG scores or looking at evidence from later sample years 2019-2022, a positive association is observed. Our evidence

for a nonlinear association between ownership and ESG scores is not robust against the use of MSCI ESG scores, possibly due to a lower sample size, and is driven mainly by observations in the UK and later sample years 2019-2022 containing more cross-sectional observations. Lastly, our analysis looking at first differences with lagged independent variables to give evidence that is less affected by reverse causality and endogeneity reveals no association between ownership variables and overall ESG scores, indicating that both factors are likely to influence our results.

Table 14. Variance inflation factors (VIF)

The table shows the variance inflation factors (VIF) for explanatory variables in models 1 and 2. The VIF is equal to $1 / (1 - R^2)$, where R^2 is equal to the R-squared from a regression model, where the variable in question is regressed against the other explanatory variables.

Variable	VIF	Variable	VIF
Insider	1.40	Top5	1.20
Institutional	1.46	ROA	1.49
ROA	1.49	Slack	1.68
Slack	1.69	Company size	1.77
Company size	1.76	Company age	1.27
Company age	1.27	Leverage	1.43
Leverage	1.43	Tobin's Q	1.53
Tobin's Q	1.53	Volatility	1.79
Volatility	1.79		

Table 15. Changes in ESG Scores and lagged changes in ownership variables

The table shows fixed effects regressions of the change in ESG score (ESG), Environment Score (E) and Social Score (S) (calculated as the score at time t less the score one year prior) on lagged changes in top 5, Insider and Institutional ownership and controls (t-1 to t-2). A higher ESG score indicates better performance. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. The models are adapted from Fahlenbrach and Stulz (2009).

	ΔESG			ΔE			ΔS			ΔG		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ΔTop5 (t-1)	-1.04			-1.91			2.76**			-6.37***		
	(-0.99)			(-1.36)			(2.11)			(-2.95)		
ΔInsider (t-1)		0.35			-0.71			1.59			-1.01	
		(0.37)			(-0.44)			(1.46)			(-0.48)	
ΔInstitutional (t-1)			0.38			2.40			2.68			-5.63**
			(0.28)			(1.31)			(1.62)			(-2.34)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687
Adjusted R^2	0.025	0.025	0.025	0.023	0.023	0.023	0.018	0.017	0.018	0.016	0.014	0.015

Table 16. Changes in ESG scores and changes of over 5% in ownership

The table shows fixed effects regressions of the change in ESG score (ESG), Environment Score (E) and Social Score (S) (calculated as the score at time t less the score one year prior) on lagged changes in controls and indicator variables Increase and Decrease, for changes of over 5% in top 5, Insider and Institutional ownership (t-2 to t-1). A higher ESG score indicates better performance. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. The models are adapted from Fahlenbrach and Stulz (2009).

	ΔESG			ΔE			ΔS			ΔG		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Increase Top5	0.08			-0.23			1.00***			-0.96*		
	(0.28)			(-0.65)			(2.73)			(-1.77)		
Decrease Top5	0.39			0.75**			-0.24			1.02*		
	(1.58)			(2.26)			(-0.81)			(1.94)		
Increase Insider		0.39			0.08			0.97*			-0.05	
		(0.92)			(0.14)			(1.76)			(-0.06)	
Decrease Insider		0.40			1.61***			0.02			0.04	
		(1.13)			(2.90)			(0.04)			(0.05)	
Increase Institutional			0.23			0.50			0.31			-0.34
			(0.83)			(1.38)			(0.85)			(-0.66)
Decrease Institutional			0.23			0.03			-0.34			1.28**
			(0.79)			(0.08)			(-1.00)			(2.14)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687	5,687
Adjusted R^2	0.025	0.025	0.025	0.024	0.024	0.023	0.019	0.017	0.017	0.016	0.014	0.015

7 Conclusion

We provide evidence for the association between ownership and ESG performance, accounting for various ownership types and different ESG dimensions, and explore the mechanism through which they are interlinked. Our main findings remain relatively robust across multiple dimensions, including the use of alternative data sources, variations in country-specific data, and different time frames. Overall, we find that ownership concentration and insider shareholdings are both negatively associated with firm ESG performance. At the highest level of insider holdings, the adverse relationship between insider ownership and ESG is partly mitigated compared to when concentration is moderate, potentially due to the increased alignment of incentives. Perhaps surprisingly, institutional ownership is not linearly associated with ESG performance in our full sample analyses. One possibility may be because the relationship is non-linear: performance is the highest at moderate concentrations, but the negative impacts observed at lowest and highest concentrations appear to offset each other. Alternatively, another explanation may lie in the method of measuring ESG performance, as our robustness test revealed a significant positive correlation with MSCI data. Moreover, neither the existence of ESG and financial incentives nor higher financial resource availability moderate the negative association of insider ownership. This pattern suggests that more fundamental factors, perhaps personal preferences may guide the decisions of insiders, or it may indicate the presence of other external factors that have not yet been identified.

Further, we find that the relationship between ownership and ESG can vary depending on the specific aspect of ESG and time period examined. We find some indication that the negative association related to insider investors may be weaker when an ESG measure is more aligned with financial goals. For example, we find that the Social pillar of the ESG score shows a less negative association with insider concentration compared to the Environmental and Governance pillars. Employee satisfaction and product development, which are encompassed within the Social pillar, are closely linked to enhancing financial performance (Brammer et al., 2007; Rees & Rodionova, 2013). As well, while owner identity and ownership concentration are both important for ESG performance, only ownership concentration appears to matter for the number of ESG-related controversies. Higher ownership concentration is associated with fewer controversies, possibly due to increased monitoring and reduced agency conflicts associated with large blockholders. However, there is no systematic variation based on owner identity, suggesting that all owners are equally motivated to avoid ESG controversies, as they are likely detrimental to all stakeholders. Finally, we also observe a change in trend in more recent sample years, with a less negative association between insider ownership and ESG scores compared to earlier periods and a positive association between institutional ownership and ESG, which was not observed when looking at the full sample.

Naturally, our paper is subject to a number of key limitations. Firstly, the quality of ESG data is a concern, as it may not be fully representative of the true commitments of the firm and different data sources may lead to varying outcomes (Kotsantonis and Serafeim, 2019). We mitigate this issue in our robustness check by sourcing data from two sources – Refinitiv and MSCI. Secondly, our analysis is limited to exploring insider and institutional investors at a general level, while a more detailed breakdown of owner identity, such as family investors or short- and long-term institutional investors, could provide further insights. Thirdly, issues related to OLS/fixed regression models apply, as the interpretation of our results lie in the strength of the instruments used. Fourthly, our analysis is based on ownership figures from Refinitiv and limited to the ownership of the five largest shareholders, which may not always provide the entire picture of company ownership. Lastly, it is important to note that within group variation is likely to be high in the ownership-ESG context, and regression analyses only reveal information about the average effect related to a characteristic. While many of our models are able to explain a relatively good proportion of variation in ESG performance with adjusted R-squared of around 0.55, some of our models have relatively low explanatory power, calling in to question whether other characteristics not included in our models play a larger role.

Crucially, we cannot make any causal inferences on the effect of ownership on ESG, as endogeneity issues and reverse causality are likely at least partially contributing to our results. We attempt to address these concerns by focusing on only the largest company owners who may actually have an impact for ESG performance as well as looking at regressions using first differences (changes in ownership) and lagged explanatory variables in our robustness checks. However, the analyses do not rule out endogeneity/reverse causality. ESG performance may influence a company's ownership structure and not the other way around for example when certain types of owners, such as institutional investors, prefer companies with high ESG performance. Endogeneity could also arise if low ESG performance decreases the likelihood of a company being acquired, making insiders more likely to stay on as majority owners for longer.

Our findings contribute to the literature on company ownership and ESG/CSR performance and hold relevance for practitioners and institutions, particularly in light of the European Union's recent initiatives to enhance corporate ESG practices and reduce greenwashing. Given that insider control and concentrated ownership may hinder the pursuit for optimal corporate responsibility and shareholder democracy, distinction in ownership structure could be factored in future regulatory and policy frameworks. Furthermore, addressing specific ways to mitigate agency problems associated with concentrated and insider shareholdings is crucial, as our analysis suggests that incentives do not moderate the negative relationship. Perhaps this may require more focused efforts on ownership-specific policies rather than relying on softer ESG incentives to solve the issue.

Looking ahead, future research could explore an expanded dataset that includes additional years. As our robustness check indicates, recent years show a

divergent trend from earlier periods, possibly due to the growing mandatory nature of ESG reporting. The enforcement of the EU Taxonomy and CSRD starting in January 2023 could alter the relationship between ownership and ESG, as all companies are mandated to report on ESG in a standardized way that helps increase comparability and reduce greenwashing (European Commission, 2024). Secondly, future research could benefit from examining more specific data, such as green revenue and green operational expenses, following the enforcement of the CSRD, as well as project-specific metrics. This approach could help isolate and provide insights into "hard" outcomes, clarifying the distinction between quantifiable ("hard") aspects and qualitative ("soft") aspects of current ESG performance. Thirdly, conducting country-specific studies could offer deeper insights into the factors influencing the ESG-ownership relationship, especially since our results in Europe are predominantly driven by data from the UK. Fourthly, Industry-specific studies could also be explored, as focusing on certain types of companies would allow the use of specific ESG metrics that are most relevant for the industry in question, possibly offering valuable insights. Lastly, the topics could be approached using different methodology such as firm fixed effects models or natural experiment, which could help address concerns of endogeneity.

Appendix

Appendix 1. Main regressions using MSCI ESG Scores

The table shows a summary of regression coefficients on ownership variables from models 1, 2 and 3 regressions using MSCI ESG industry-adjusted ESG, E, S, and G scores as the dependent variable. MSCI ESG scores range from 0-10, where a higher score signifies better performance. Control variables ROA, Slack, Company Size, Company Age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile. Year and country fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Model 1

	Expected	ESG			E			S			G		
	sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Top5	-	-1.06***			-0.99***			0.24			-1.15***		
		(-3.0)			(-3.8)			(0.8)			(-5.4)		
Insider	-		-1.42***			-0.95***			-0.24			-1.00***	
			(-4.6)			(-3.9)			(-0.9)			(-5.5)	
Institutional	+			1.29***			0.40			0.68*			1.31***
				(3.2)			(1.2)			(1.8)			(5.5)

Model 2

	Expected	ESG		E		S		G	
	sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Insider	-	-1.31***	-2.84***	-1.21***	-2.14**	-0.16	-1.03	-0.78***	-0.83
		(-3.8)	(-2.9)	(-3.5)	(-2.4)	(-0.6)	(-1.4)	(-3.4)	(-1.4)
Insider^2	+		2.06*		1.69		1.40		0.33
			(1.7)		(1.2)		(1.2)		(0.4)
Institutional	+	0.39	1.89*	-0.58	1.05	0.40	0.28	0.86***	3.08***
		(0.5)	(1.7)	(-1.3)	(0.87)	(1.0)	(0.3)	(2.9)	(3.7)
Institutional^2	-		-2.55		-2.76		0.16		-3.67***
			(-1.6)		(-1.6)		(0.1)		(-3.6)

Appendix 2. Linear regression coefficients and t-statistics from country subsamples

Year and industry fixed effects and controls are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

UK (N = 3698)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-13.28***		-11.84***		-10.29***		-17.38***	
	(-4.57)		(-3.19)		(-3.12)		(-4.67)	
Insider		-13.79***		-11.35***		-11.54***		-17.84***
		(-4.54)		(-2.74)		(-3.29)		(-4.62)
Institutional		5.12		7.61*		4.43		3.95
		(1.18)		(1.68)		(0.96)		(0.67)
Germany (N = 1557)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-9.18**		-4.43		-5.58		-19.64***	
	(-2.55)		(-0.95)		(-1.35)		(-3.91)	
Insider		-9.24***		-3.27		-4.89		-20.52***
		(-2.85)		(-0.72)		(-1.27)		(-4.84)
Institutional		0.45		-4.73		4.89		1.84
		(0.08)		(-0.58)		(0.81)		(0.3)
France (N = 1493)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-11.35***		0.83		-3.68		-29.07***	
	(-2.87)		(0.17)		(-0.76)		(-5.34)	
Insider		-6.43*		-3.5		0.03		-14.63***
		(-1.72)		(-0.76)		(0.01)		(-2.68)
Institutional		9.85*		6.21		10.81		9.45
		(1.74)		(0.82)		(1.58)		(1.15)
Italy (N = 591)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	0.86		9.78		6.94		-17.01*	
	(0.17)		(1.48)		(1.2)		(-1.96)	
Insider		-1.48		1.73		-2.1		-5.09
		(-0.3)		(0.24)		(-0.36)		(-0.69)
Institutional		7.97		5.88		11.08		13.46
		(1.01)		(0.49)		(1.15)		(1.22)
Spain (N = 575)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-3.01		1.48		-2.97		-10.34	
	(-0.46)		(0.23)		(-0.36)		(-1)	
Insider		-5.14		-4.4		-3.74		-12.7
		(-0.73)		(-0.48)		(-0.48)		(-1.23)
Institutional		-7.68		0.89		-2.47		-27.58**
		(-1.04)		(0.13)		(-0.26)		(-2.55)
Netherlands (N= 525)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-2.52		0.02		1.24		-9.55	
	(-0.44)		(0)		(0.21)		(-1.15)	
Insider		-19.71***		-31.71***		-12.84**		-18.62**
		(-4.29)		(-4.48)		(-2.52)		(-2.53)
Institutional		-9.57		-14.84		-0.7		-13.44
		(-1.15)		(-1.05)		(-0.08)		(-1.04)

Appendix 3. Nonlinear regression coefficients and t-statistics by country sample

Year and industry fixed effects and controls are included in the models, and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

		UK	Germany	France	Italy	Spain	Netherlands
	Expected sign	ESG	ESG	ESG	ESG	ESG	ESG
Insider	-	-34.58***	2.37	-7.9	14.6	1.34	-23.51
		(-4.18)	(0.25)	(-0.83)	(0.89)	(0.05)	(-1.34)
Insider^2	+	40.1***	-15.82	4.33	-24.49	-9.15	7.26
		(3.36)	(-1.23)	(0.3)	(-1.01)	(-0.27)	(0.25)
Institutional	+	32.77***	2.52	30.36**	-0.99	7.86	1.42
		(3.19)	(0.21)	(2.03)	(-0.04)	(0.5)	(0.09)
Institutional^2	-	-42.87***	-2.7	-34.37	17.7	-23.6	-23.01
		(-2.84)	(-0.16)	(-1.35)	(0.52)	(-0.91)	(-0.95)
Observations		3,698	1,557	1,493	591	575	525

Appendix 4. Linear regression coefficients and t-statistics by year

Year, industry and country fixed effects and controls are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Years 2002 – 2013 (N = 2376)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-7.59**		-3.94		-4.06		-15.84***	
	(-2.43)		(-1.01)		(-1.07)		(-3.77)	
Insider		-13.91***		-13.19***		-10.88**		-17.8***
		(-3.71)		(-2.78)		(-2.5)		(-3.73)
Institutional		-3.2		-4.94		-3.74		-2.53
		(-0.76)		(-0.93)		(-0.71)		(-0.46)
Years 2014 – 2018 (N = 2252)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-10.96***		-5.14		-5.65*		-23.98***	
	(-4.04)		(-1.38)		(-1.75)		(-6.46)	
Insider		-14.24***		-12.34***		-9.96***		-23***
		(-5.23)		(-3.09)		(-3.03)		(-6.79)
Institutional		2.02		-0.88		3.04		2.01
		(0.48)		(-0.17)		(0.63)		(0.33)
Years 2019 – 2020 (N = 1678)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-10.7***		-5.96**		-4.6*		-22.71***	
	(-4.78)		(-2.05)		(-1.81)		(-7.31)	
Insider		-9.27***		-6.84***		-2.82		-19.02***
		(-4.65)		(-2.59)		(-1.2)		(-7)
Institutional		6.37*		0.85		11.74***		5.79
		(1.93)		(0.2)		(3.16)		(1.26)
Years 2021 – 2022 (N = 1951)								
	ESG		E		S		G	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top5	-11.96***		-6.58**		-7.15***		-21.97***	
	(-5.41)		(-2.47)		(-2.91)		(-7)	
Insider		-7.24***		-3.11		-4.17*		-13.61***
		(-3.67)		(-1.29)		(-1.8)		(-4.73)
Institutional		6.53**		3.7		7.37**		10.54**
		(2.27)		(1.04)		(2.24)		(2.53)

Appendix 5. Nonlinear regression coefficients and t-statistics by year

Year, industry and country fixed effects and controls are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

		2002-2013	2014-2018	2019-2020	2021-2022
	Expected sign	ESG	ESG	ESG	ESG
Insider	-	-18.27*	-24.02***	-17.35***	-13.77**
		(-1.69)	(-3.11)	(-2.94)	(-2.5)
Insider^2	+	-2.76	14.45	30.3***	29.98***
		(-0.23)	(1.32)	(3.6)	(4.2)
Institutional	+	7.42	16.88	15.03*	12
		(0.4)	(1.42)	(1.8)	(1.49)
Institutional^2	-	-1.02	-21.01	-38.65***	-37.87***
		(-0.05)	(-1.15)	(-3.38)	(-3.87)
Observations		2,376	2,252	1,678	1,951

Appendix 6. Regressions of ESG scores by subsamples of above and below median governance

Year, industry and country fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	ESG		E		S	
	High G	Low G	High G	Low G	High G	Low G
Insider	-5.70***	-4.91***	-5.73*	-6.49**	-3.70	-3.10
	(-2.94)	(-2.69)	(-1.83)	(-2.26)	(-1.36)	(-1.32)
Institutional	-1.41	3.56	-1.94	-1.09	-0.07	5.98
	(-0.54)	(1.30)	(-0.44)	(-0.30)	(-0.02)	(1.55)
ROA	0.13*	0.18***	0.16	0.17	0.11	0.21**
	(1.95)	(2.71)	(1.36)	(1.62)	(1.22)	(2.15)
Slack	2.58	-2.19	6.54	-0.37	0.19	-5.39
	(0.89)	(-0.75)	(1.37)	(-0.08)	(0.04)	(-1.35)
Company size	6.33***	7.25***	9.00***	9.78***	7.43***	8.34***
	(23.61)	(24.61)	(21.86)	(22.39)	(20.41)	(20.90)
Company age	0.05**	0.11***	0.07*	0.15***	0.06*	0.14***
	(2.28)	(4.63)	(1.71)	(4.11)	(1.80)	(4.57)
Leverage	4.02	5.01*	5.42	1.53	5.00	8.26**
	(1.57)	(1.85)	(1.27)	(0.37)	(1.41)	(2.09)
Tobin's Q	0.69	0.97	0.45	0.67	1.54*	2.16**
	(1.13)	(1.50)	(0.48)	(0.68)	(1.84)	(2.47)
Volatility	-0.21**	0.09	-0.30*	0.02	-0.39***	-0.08
	(-2.14)	(0.94)	(-1.90)	(0.15)	(-2.89)	(-0.58)
Observations	4,220	4,219	4,220	4,219	4,220	4,219
Adjusted R^2	0.55	0.49	0.50	0.48	0.49	0.43

Appendix 7. ESG incentives and company ownership

The table shows fixed effects regressions of ESG incentive variables on ownership and control variables. ESG Incentives is an indicator variable equal to one if company senior executive's pay is linked to ESG targets and zero otherwise. CSR Incentives score is equal to the Refinitiv CSR compensation incentives score, where a higher score indicates better performance. Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. Control variables ROA, Slack, Company Size, Company Age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	ESG Incentives	CSR Incentives Score	ESG Incentives	CSR Incentives Score	ESG Incentives	CSR Incentives Score
	(1)	(2)	(3)	(4)	(5)	(6)
Top5	-0.18***	-12.35***				
	(-3.52)	(-3.99)				
Insider			-0.22***	-14.92***		
			(-5.22)	(-5.55)		
Institutional					0.21***	12.07***
					(3.44)	(3.25)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,439	8,439	8,439	8,439	8,439	8,439
Adjusted R^2	0.22	0.19	0.23	0.19	0.22	0.19

Appendix 8. Full summary of main regression results

The table summarizes our main analysis results. Hypotheses are defined as the following: H1: Ownership concentration is negatively associated with ESG performance.; H2: Insider ownership is negatively associated with ESG performance.; H3: Institutional ownership is positively associated with ESG performance.; H4: There is a convex (U-shaped) relationship between insider ownership and ESG performance.; H5: There is a concave (inverted U-shaped) relationship between institutional ownership and ESG performance.

Dependent variable: ESG score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	-	-	H1	Yes
Insider	-	-	H2	Yes
Institutional	+	0	H3	No
Insider / Insider^2	- / +	- / +	H4	Yes
Institutional / Institutional^2	+ / -	+ / -	H5	Yes
Dependent variable: Environment score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	-	-	H1	Yes
Insider	-	-	H2	Yes
Institutional	+	0	H3	No
Insider / Insider^2	- / +	- / 0	H4	No
Institutional / Institutional^2	+ / -	0 / 0	H5	No
Dependent variable: Social score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	-	-	H1	Yes
Insider	-	-	H2	Yes
Institutional	+	0	H3	No
Insider / Insider^2	- / +	- / +	H4	Yes
Institutional / Institutional^2	+ / -	+ / -	H5	Yes
Dependent variable: Governance score				
Independent Variable	Expected sign	Result	Hypothesis	Hypothesis accepted
Top5	-	-	H1	Yes
Insider	-	-	H2	Yes
Institutional	+	0	H3	No
Insider / Insider^2	- / +	- / 0	H4	No
Institutional / Institutional^2	+ / -	+ / -	H5	Yes

Appendix 9. Regressions of category scores

The table shows fixed effects regressions of the category scores that make up E, S and G. A higher score indicates better performance. Insider is equal to the ownership share of insiders within the top 5 and Institutional is equal to the ownership of institutions within the top 5 shareholders. Control variables ROA, Slack, Company Size, Company Age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Environment Score			Social Score				Governance Score		
	Emissions	Resource Use	Innovation	Community	Human Rights	Workforce	Product Responsibility	Management	Shareholders	CSR Strategy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Insider	-11.71***	-9.71***	-4.15	-7.40**	-7.22**	-5.96***	-1.58	-19.59***	-12.26***	-11.59***
	(-4.17)	(-3.35)	(-1.22)	(-2.44)	(-2.30)	(-2.68)	(-0.47)	(-6.46)	(-4.07)	(-3.73)
Institutional	-2.08	0.99	6.27	7.34*	2.40	4.95	-1.47	6.03	7.97*	-0.27
	(-0.56)	(0.26)	(1.41)	(1.75)	(0.53)	(1.62)	(-0.31)	(1.43)	(1.70)	(-0.07)
ROA	0.32***	0.30***	-0.11	0.10	0.24**	0.25***	0.24**	0.16	0.28**	0.33***
	(3.26)	(2.63)	(-1.00)	(0.94)	(2.13)	(2.87)	(2.04)	(1.60)	(2.52)	(3.22)
Slack	2.68	3.39	1.23	-14.03***	-1.39	0.12	-1.25	-1.19	6.69	3.84
	(0.56)	(0.67)	(0.25)	(-2.91)	(-0.23)	(0.03)	(-0.23)	(-0.27)	(1.31)	(0.86)
Company size	10.68***	10.98***	8.08***	10.31***	10.36***	7.49***	7.01***	6.46***	3.09***	10.43***
	(28.80)	(26.74)	(17.18)	(24.59)	(22.82)	(21.50)	(15.15)	(14.60)	(6.55)	(25.83)
Company age	0.11***	0.12***	0.09**	0.10**	0.10**	0.10***	0.07*	0.03	-0.07*	0.11***
	(3.02)	(2.91)	(1.97)	(2.56)	(2.35)	(3.76)	(1.65)	(0.67)	(-1.75)	(2.99)
Leverage	-3.57	3.19	-4.83	11.44**	3.20	-2.16	14.53***	-0.37	1.51	-2.94
	(-0.93)	(0.70)	(-1.10)	(2.48)	(0.63)	(-0.66)	(3.00)	(-0.09)	(0.34)	(-0.72)
Tobin's Q	0.90	0.89	-0.14	3.05***	2.46**	1.62**	1.69	1.51*	-1.09	0.23
	(0.97)	(0.91)	(-0.15)	(3.03)	(2.33)	(2.29)	(1.61)	(1.70)	(-1.16)	(0.23)
Volatility	-0.23	-0.39**	0.14	0.04	-0.27	-0.08	-0.61***	0.07	0.48***	0.01
	(-1.52)	(-2.48)	(0.81)	(0.29)	(-1.54)	(-0.69)	(-3.52)	(0.48)	(2.99)	(0.10)
N	8,104	7,607	7,569	8,134	7,575	8,137	7,645	8,161	7,697	8,151
Adj. R^2	0.44	0.43	0.35	0.34	0.40	0.37	0.33	0.18	0.07	0.41

Appendix 10. Regressions of ESG scores with ownership indicator variables

The table shows fixed effects regressions of ESG, E, S and G score on ownership indicator and control variables. A higher ESG score indicates better performance. Top5 is equal to the ownership share of the five largest shareholders, Insider is equal to the ownership of insiders within the top 5 shareholders and Institutional is equal to the ownership of institutions within the top 5 shareholders. Year, country, and industry fixed effects are included in the models and t-statistics are based on robust standard errors clustered by firm. *, **, and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively. Control variables ROA, Slack, Company Size, Company Age, Leverage, Tobin's Q and Volatility are winsorized at the 1st and 99th percentile

	ESG				E			S			G		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Top5 > 0.5		-4.40***			-2.47**			-2.08**			-8.95***		
		(-6.07)			(-2.51)			(-2.39)			(-9.12)		
Insider > 0.2			-4.75***			-3.01***			-3.00***			-8.30***	
			(-5.86)			(-2.67)			(-3.13)			(-7.65)	
Institutional > 0.2				3.81***			2.62***			2.89***			6.04***
				(5.69)			(2.90)			(3.63)			(6.33)
ROA	0.17***	0.17***	0.19***	0.19***	0.17**	0.18**	0.18**	0.17**	0.18**	0.18**	0.15*	0.17**	0.17**
	(2.79)	(2.85)	(3.13)	(3.07)	(1.98)	(2.11)	(2.09)	(2.25)	(2.40)	(2.40)	(1.88)	(2.20)	(2.11)
Slack	0.23	0.37	0.20	0.17	3.17	3.07	3.05	-2.69	-2.78	-2.81	1.36	1.01	0.97
	(0.08)	(0.13)	(0.07)	(0.06)	(0.83)	(0.80)	(0.80)	(-0.77)	(-0.81)	(-0.81)	(0.38)	(0.28)	(0.26)
Company size	8.67***	8.48***	8.58***	8.75***	10.08***	10.13***	10.24***	8.82***	8.86***	8.97***	6.23***	6.47***	6.74***
	(34.70)	(33.50)	(34.83)	(35.34)	(31.35)	(32.43)	(32.99)	(29.93)	(30.78)	(31.42)	(18.57)	(19.01)	(19.46)
Company age	0.08***	0.08***	0.09***	0.08***	0.11***	0.11***	0.11***	0.09***	0.10***	0.09***	0.03	0.04	0.04
	(3.74)	(3.57)	(3.86)	(3.75)	(3.37)	(3.47)	(3.43)	(3.58)	(3.73)	(3.68)	(0.89)	(1.30)	(1.17)
Leverage	4.07	3.75	3.90	3.28	2.74	2.81	2.38	6.81**	6.85**	6.36**	0.09	0.46	-0.50
	(1.57)	(1.47)	(1.53)	(1.28)	(0.77)	(0.80)	(0.67)	(2.15)	(2.17)	(2.01)	(0.03)	(0.14)	(-0.15)
Tobin's Q	1.08*	1.03*	1.12*	1.08*	0.72	0.78	0.76	1.96***	2.01***	1.99***	0.53	0.70	0.64
	(1.70)	(1.67)	(1.82)	(1.74)	(0.88)	(0.95)	(0.92)	(2.69)	(2.76)	(2.73)	(0.70)	(0.91)	(0.82)
Volatility	-0.05	-0.03	-0.02	-0.05	-0.12	-0.11	-0.13	-0.20*	-0.18*	-0.20*	0.15	0.17	0.12
	(-0.56)	(-0.38)	(-0.24)	(-0.54)	(-0.96)	(-0.88)	(-1.01)	(-1.84)	(-1.73)	(-1.90)	(1.35)	(1.48)	(1.07)
Observations	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439	8,439
Adjusted R^2	0.53	0.54	0.54	0.54	0.52	0.52	0.52	0.49	0.49	0.49	0.26	0.25	0.24

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