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Blockholding, ownership horizon, and firms' ESG performance

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ABSTRACT

This paper examines whether blockholders and their investment horizon influence firms' ESG performance in the Nordic countries. We use ownership data for the three largest owners of the publicly listed firms, and we find a positive, statistically significant association between the ownership of the top two blockholders and a firm's ESG scores. Closer analysis reveals that the impact is driven by long-term blockholders. The effect concentrates on the environmental and social pillars, rather than governance. Our study contributes to the literature by showing that long-term horizons of the largest blockholders, identified through observed holding periods, play a key role in shaping firms' ESG performance in the Nordic context. The results imply that boards, policymakers, and stewardship teams can leverage stable, long-horizon blockholders to advance environmental and social efforts, even when governance scores do not move in tandem.

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1. Introduction

Growing concerns about issues such as climate change and social imbalance have significantly raised public interest in sustainability and corporate social responsibility (CSR). Investors have intensified efforts to direct investments into firms that align their operations to meet sustainability goals (Krueger, Sautner, and Starks 2020). Today, businesses face stiffer demand from stakeholders (consumers, suppliers, employees, investors, and governments) to improve sustainability practices within and outside of the firm (Kolk and Van Tulder 2010). Thus, the need for business owners to steer firms in the direction of enhanced sustainability performance cannot be underestimated. The owners influence company policies through the board of directors, who appoint managers to implement policies that align with the firm's goals (Downs and Sommer 1999). Investors and especially large owners can significantly influence a firm's ESG performance (Dimson, Karakaş, and Li 2021).

The impact of different ownership types or structures on firm performance has been extensively studied in the literature over the years. For example, Brunzell, Liljeblom, and Vaihekoski (2015) classify owners into long-term and short-term to capture the horizon of owners and investigate the possibility of ownership myopia or short-termism in relation to firm financial performance. Anderson and Reeb (2003) investigate the relation between founding family ownership and firm performance using data on S&P 500 firms, while other studies have predominantly focussed on institutional ownership (e.g. Lin and Fu 2017). Overall, earlier studies examining ownership influence on firm performance focus on family ownership, public ownership, and particularly institutional ownership (e.g. Ioannou and Serafeim 2012). More recently, the influence of ownership on a firm's ESG performance has gained more attention. For example, Rees and Rodionova (2015) study the impact of equity holdings by families on the E, S, and G scores of firms using data from 46 countries over ten years. Wu et al. (2022) examine the moderating role of ownership structure on the relation between a firm's ESG performance and value. Lavin

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and Montecinos-Pearce (2021) examine the influence of board characteristics and ownership structure on ESG disclosure in emerging markets.

The results on ownership influence on the ESG performance of firms are mixed. On one hand, some studies (e.g.Rees and Rodionova 2015) found family ownership to be associated with reduced ESG performance, indicating that family owners are more keen on maximising financial wealth against investment in social good. On the other hand, Wu et al. (2022) shows contradictory evidence indicating that there is a positive relationship between ESG performance and firm value through the moderating role of institutional ownership, which can be explained by monitoring, agency theory, and wealth maximisation. This is in line with documented evidence that the management monitoring ability of blockholders ensures that their interests are satisfied (see, e.g.Burkart, Gromb, and Panunzi 1997; Shleifer and Vishny 1986). In addition, while prior research has advanced understanding of how *ex ante* perceived investment horizon for certain investor classes, a critical research gap remains regarding the influence of the *realised* investment horizon of major blockholders on firms' actual ESG performance. Much of the existing evidence–such as Eliwa and Elmaghrabi (2025), who examine institutional investors' horizons in relation to ESG decoupling, or Boubaker et al. (2017) and Gloßner (2019), who analyse institutional horizons and CSR performance–relies primarily on proxy-based measures like portfolio turnover or investor classification (institutional vs. non-institutional). These approaches capture expected or typological horizons rather than the observed duration of ownership and thus leave unresolved whether the true holding period of controlling shareholders, regardless of type, translates into measurable differences across the ESG pillars.

In this study, we investigate whether the ownership stake and investment horizon of major shareholders impact a firm's ESG performance. Following Brunzell, Liljeblom, and Vaihekoski (2015), we classify the owners of Nordic publicly listed companies into long-term and short-term ones, with the intention of using short-term ownership as a proxy for ownership myopia or short-termism. In this study, however, the classification is based on observed ownership terms: the number of years stock is held by the largest owners (blockholders). Focusing on blockholders aligns with the documented evidence (Barnea and Rubin 2010) that influential blockholders have the opportunity to monitor management and, as such, they are the group of shareholders with the greatest influence on the firm's ESG investments. The Nordic context offers an ideal setting to examine whether the true holding period of controlling shareholders affects ESG performance. Beyond its reputation for social trust, the region's institutional similarity, strong governance, and deep ESG integration reduce cross-country noise, allowing clearer identification of how sustained ownership commitment–rather than investor type or disclosure rhetoric–translates into realised ESG performance.

Our analysis is closely related to Eliwa and Elmaghrabi (2025), who examine ESG decoupling – discrepancy between firms' actual ESG performance and their reported ESG commitments – across countries and find that long-term institutional investors narrow the gap between disclosure and performance while short-term investors have no impact. Our study, however, differs in focus, sample, and measurement. We examine the determinants of realised ESG performance, i.e, how ownership horizons influence the extent to which firms achieve substantive improvements in their sustainability practices. This distinction from decoupling matters because long-term ownership affects the implementation quality and persistence of ESG initiatives through enhanced monitoring, resource commitment, and strategic continuity (Flammer and Bansal 2017). Hence, while complementing decoupling research, our study shifts the emphasis from the credibility of ESG claims to the capacity of owners to drive tangible sustainability performance. By integrating observed blockholder horizons, which reflect the actual commitment rather than turnover-based labels, within the relatively uniform Nordic institutional environment, we isolate the behavioural and governance mechanisms through which long-term ownership engagement translates into verifiable ESG improvements, extending ownership–ESG research beyond analyses of disclosure or commitment quality.

We find that larger blockholding significantly increases firms' ESG performance, especially when the top two largest owners are long-term investors. The baseline result is confirmed with the instrumental variable analysis, which addresses potential endogeneity. Overall, our findings support the established conclusion in Bénabou and Tirole (2010) that focussing on sustainability curbs short-termism and allows the company's management to take a long-term perspective and maximise inter-temporal profits.

This study contributes significantly to existing research on firm ownership and sustainability. First, we add knowledge on the relevance of large shareholding and shareholder engagement in firms' ESG performance and

sustainability, which are important to corporate growth, especially in the long-term (Aboud and Diab 2022). Second, this study examines the relationship between ownership horizons from a different perspective by identifying owners' horizons based on their observed holding periods. This approach is firmly rooted in agency and stewardship theories, which posit that sustained ownership enhances monitoring effectiveness and aligns managerial incentives with long-term stakeholder goals. Empirically, longer holding durations have been linked to lower managerial short-termism (Yin, Ward, and Tsolacos 2018), stronger governance and oversight (Crane, Michenaud, and Weston 2016), and increased investment in innovation and ESG-related activities (Flammer and Bansal 2017; Harford, Kecskés, and Mansi 2018). We differ from earlier studies (see, e.g.Dyck et al. 2019; Gloßner 2019; Wang et al. 2023) that infer investor horizons from trading behaviour or institutional type, which may mask substantial heterogeneity in time orientation and engagement intensity (Edmans 2014). By relying on observed holding durations, our study captures genuine investor commitment and offers a more accurate empirical basis for assessing how enduring ownership contributes to sustained ESG performance.

Finally, focussing on the Nordic countries to study sustainability can be motivated by several unique features. First, Nordic countries can be considered at the forefront of actions on sustainability due to their well-recognised, unique Nordic ESG model, which is closely connected with the social–democratic, institutional–cultural, and political–economic institutions of the countries (Gjølberg 2013; Strand, Freeman, and Hockerts 2015). Thus, our study tests an essential corporate actor's (i.e. owners) influence on firms' sustainability in a best-in-class setting since Nordic countries have better ESG standards and performance than other regions in the world, as Dimson, Karakaş, and Li (2021) show that shareholders' engagement is more successful when investors from countries with high social norms are involved. This adds to earlier studies on this topic that have focussed either on a large international sample of firms (e.g.Dyck et al. 2019) or single countries like China (e.g.Li, Wang, and Wu 2021).

The rest of the article is organised as follows. The literature review and hypothesis development are discussed in Section 2. Data and research design are discussed in Section 3. Section 4 presents the main empirical results, additional consideration, and robustness test. Section 5 concludes the paper and offers suggestions for further research.

2. Theoretical framework, literature review and hypothesis development

The influence of ownership on firm performance can be examined from different angles, one of which is the challenge of short-termism or managerial myopia stemming from the extreme urge of managers for short-term profit at the expense of the long-term value of the firm (Gloßner 2019). This study considers two fundamental issues in developing testable hypotheses. First, the effect of equity blockholding and the channels through which it influences a firm's ESG performance. Second, the short-term and long-term orientation of owners' effect on ESG performance is considered.

2.1. Equity blockholding and ESG performance

The agency theory posits that the objectives of owners and managers are not always aligned because of divergent incentives and time horizons (Shleifer and Vishny 1997). Managers may pursue short-term performance targets to enhance compensation or career prospects, which leads to underinvestment in long-term projects such as sustainability initiatives that require extended periods to generate returns (Brunzell, Liljeblom, and Vaihekoski 2015). This managerial myopia is further reinforced when shareholders themselves adopt short-term perspectives, creating a feedback loop of short-termism that discourages ESG investment, in line with evidence that transient institutional investors induce managers to cut long-horizon projects such as R&D (Bushee 1998). Agency problems can also arise in the opposite direction when managers overinvest in ESG projects for reputational or personal reasons. Barnea and Rubin (2010) show that managers may undertake socially responsible investments to build their professional standing even when the initiatives have negative net present value, shifting costs onto shareholders. This misalignment is particularly salient for large, financially oriented investors who bear most of the costs of such discretionary ESG expenditures (Cespa and Cestone 2007; Cox, Brammer, and Millington 2004). In response, institutional investors may exert short-term pressure on managers to prioritise

financial performance and limit ESG spending (Rees and Rodionova 2015), while effective monitoring structures can instead align managerial incentives with long-term objectives so that ESG activities contribute to firm value rather than managerial self-interest (Gillan and Starks 2003; Shleifer and Vishny 1986).

A growing literature shows that the form and intensity of shareholder engagement determine whether ownership concentration strengthens or weakens ESG performance. Using a large proprietary dataset on corporate social responsibility engagements, Dimson, Karakaş, and Li (2015) document that targeted activism is associated with subsequent improvements in ESG policies and positive abnormal returns, illustrating the value of informed, sustained voice. Survey evidence in McCahery, Sautner, and Starks (2016) indicates that institutional investors often prefer engagement over exit and that long-horizon investors intervene more intensively, suggesting that ownership structure interacts with investment horizon in shaping governance strategies. Incentive contracts that incorporate ESG metrics further support alignment between managers and long-term investors by linking compensation to sustainability targets (Bénabou and Tirole 2010; Flammer and Bansal 2017). Nonetheless, the influence of concentrated ownership is inherently uncertain, since concentrated control can also facilitate the extraction of private benefits and weaken protections for minority shareholders (Bozec and Bozec 2007; Morck, Shleifer, and Vishny 1988).

Recent studies on ownership structure and ESG engagement relationship have also reflected an unresolved conclusion. Doshi et al. (2024), for example, find that government ownership among Indian non-financial firms is positively associated with ESG disclosure scores, whereas private ownership shows no significant effect, which they interpret as evidence that public accountability encourages stronger ESG reporting. However, their ESG metric is disclosure-based and observed in a single emerging market with evolving mandatory reporting rules, so ownership effects may be confounded by regulatory changes and firms' strategic responses to new disclosure requirements. By contrast, Kolsi and Muqattash (2020) examine CSR disclosure among ADX-listed firms and show that concentrated ownership and dominant blockholders are associated with lower levels of CSR reporting, yet their cross-sectional design and focus on disclosure intensity rather than realised ESG performance limit the ability to separate genuine underinvestment from selective reporting. More broadly, studies such as Demsetz and Lehn (1985) and Morck, Shleifer, and Vishny (1988) reveal that the link between ownership concentration and firm performance is weak or nonlinear, while Aboud and Diab (2022) find that concentrated ownership can enhance firm value in emerging markets through stronger monitoring. Collectively, these findings indicate that the effect of ownership concentration is contingent on the extent of blockholder engagement, their underlying incentives, and whether the analysis captures disclosure behaviour or genuine sustainability performance.

Conceptually, prior research on ownership and ESG performance diverges along three main dimensions. First, studies differ in whether they view blockholders primarily as monitors who mitigate agency problems or as entrenched owners who exploit control rights, which leads to competing predictions about the effect of ownership concentration on ESG. Second, empirical designs often emphasise ownership type (e.g. state versus private, institutional versus family) rather than the intensity and duration of blockholder engagement, even though survey and engagement evidence indicates that horizon and activism are central to governance influence (Dimson, Karakaş, and Li 2015; McCahery, Sautner, and Starks 2016). Third, the relationship between ownership concentration and ESG performance is shaped by the institutional and reporting context in which firms operate. Differences in governance quality, stakeholder orientation, and the enforcement of ESG reporting standards can shape observed relationships, making comparisons across studies difficult. Evidence indicates that variations in institutional environments and disclosure quality influence both firms' ESG performance and the extent of investor engagement (Ioannou and Serafeim 2012; Liang and Renneboog 2017). Addressing these ambiguities requires examining ownership concentration in settings with comparable governance norms and consistent ESG reporting practices, enabling clearer identification of how large shareholders shape firms' sustainability performance.

Given the mixed theoretical and empirical evidence on how ownership concentration affects sustainability, ownership concentration in Nordic firms provides an especially informative context for assessing whether blockholders act as effective stewards of sustainability. Nordic governance arrangements combine relatively high levels of investor protection and stakeholder orientation with strong norms around ESG, which, together with active engagement practices, should enhance the capacity of large shareholders to support sustainability initiatives rather than simply extract private benefits (Hansen 2023; Strand, Freeman, and Hockerts 2015). If concentrated

ownership, in such an environment, is associated with higher ESG performance, this would be consistent with the view that monitoring discipline and stewardship-oriented engagement dominate entrenchment motives. This reasoning leads to our first hypothesis:

H1: *Blockholder ownership concentration is positively associated with Nordic firms' ESG performance.*

2.2. Ownership horizon and ESG performance

Existing research on ownership and ESG performance presents enduring theoretical ambiguities and inconsistent empirical results, highlighting the complexity of investor influence on corporate sustainability practices. Early studies primarily examined the types of owners rather than their behavioural orientation. Family and state ownership, for instance, have been associated with both conservative resource management and weaker ESG engagement due to a focus on financial wealth preservation or political objectives (Li, Wang, and Wu 2021; Rees and Rodionova 2015). In contrast, institutional investors have often been credited with promoting higher ESG standards through superior monitoring and access to financial resources (Lavin and Montecinos-Pearce 2021; Wu et al. 2022). These mixed findings show two dominant theories that inform corporate governance research, with the agency view emphasising control, incentive alignment, and the mitigation of managerial opportunism, while the stewardship view emphasises trust, long-term commitment, and intrinsic motivation toward collective value creation. The persistent divergence in empirical findings indicates that each theoretical perspective captures distinct but complementary mechanisms through which ownership structures influence corporate sustainability practices.

Within the agency perspective, concentrated ownership reduces information asymmetry and curbs managerial myopia by strengthening monitoring and aligning managers' incentives with shareholder interests (Burkart, Gromb, and Panunzi 1997; Shleifer and Vishny 1997). Investors with extended horizons are expected to support sustainability projects with deferred payoffs and discourage managerial short-termism (Edmans 2014; Harford, Kecskés, and Mansi 2018). This conclusion is supported in earlier studies (see, e.g. Brunzell, Liljeblom, and Vaihekoski 2015) that show evidence of long-term owners promoting strategies that enhance the firm's long-term resilience and stakeholder relationships. However, the same concentration of control can generate entrenchment and facilitate the extraction of private benefits, which may hinder socially responsible investment and distort resource allocation (Bozec and Bozec 2007; Morck, Shleifer, and Vishny 1988). From the stewardship perspective, by contrast, owners and managers are seen as partners motivated by shared objectives, particularly within institutional contexts characterised by social trust, strong norms, and relational governance (Donaldson and Davis 1991; Grundei 2008; Strand, Freeman, and Hockerts 2015). Whereas agency mechanisms ensure discipline and accountability, stewardship mechanisms embed ethical commitment, long-term orientation, and stakeholder integration. These frameworks, though distinct, are often complementary rather than conflicting, operating together to explain how blockholders influence sustainability through both oversight and value alignment.

The applicability of agency and stewardship theory offers a coherent explanation for the heterogeneity of empirical findings on how ownership influences ESG performance. Studies informed by agency theory tend to focus on control-oriented mechanisms such as equity concentration or investor type, while stewardship-based studies emphasise commitment-oriented mechanisms like relationship quality, identity alignment, and ownership persistence. Beyond theoretical framing, empirical divergence also arises from measurement challenges. Many studies employ proxy-based indicators, e.g. portfolio turnover or institutional categorisation, to approximate ownership horizon (Boubaker et al. 2017; Gloßner 2019). Such measures capture expected or typological horizons rather than realised commitment, overlooking the fact that actual holding durations may vary widely across investors within the same classification (Edmans 2014). This measurement limitation weakens causal inference and obscures how the realised behaviour of blockholders affects corporate sustainability over time.

A further conceptual tension concerns the distinction between ESG disclosure and ESG realisation. Studies of ESG decoupling show that firms may signal strong sustainability commitments in their reports without corresponding operational performance (Cho et al. 2015; Mahoney et al. 2013). While long-term investors have been found to mitigate such decoupling by exerting credibility-enhancing influence (Eliwa and Elmaghrabi 2025),

most research still centres on communication quality rather than the substance of ESG implementation. A more rigorous understanding of ownership influence thus requires examining the conditions under which enduring ownership horizons contribute to sustained, verifiable ESG progress across ESG pillars.

Institutional context further shapes the balance between agency and stewardship mechanisms. In high-trust and institutionally mature environments such as the Nordic economies, formal governance systems already enforce high transparency and accountability standards, providing a near-controlled setting to observe how long-term ownership interacts with established governance norms (La Porta et al. 2000; Strand, Freeman, and Hockerts 2015). In such settings, extended ownership horizons may reinforce existing institutional mechanisms by ensuring strategic stability, or alternatively, may yield diminishing returns if ownership concentration leads to complacency or passive control.

Taken together, the literature shows enduring conceptual ambiguity. Ownership concentration may yield discipline or entrenchment; investor horizons may signal patient commitment or passive control; and ESG engagement may represent substantive improvement or symbolic compliance. Clarifying these tensions requires shifting attention toward the realised investment horizon of major blockholders as a behavioural indicator of sustained engagement that conditions the interplay between agency-based monitoring and stewardship-based trust. This conceptual synthesis provides the theoretical basis for the following hypothesis:

H2: *Blockholder's realised investment horizon is positively associated with the firm's ESG scores.*

3. Research design

3.1. Data

To analyse whether blockholders influence the firm's sustainability ESG scores, we collect data for publicly listed firms on the Nordic (Denmark, Finland, Iceland, Norway, and Sweden) stock exchange from 2010 to 2024. We have two main variables of interest. First, the Environmental, Social, and Governance rating scores for the firms and the combined ESG score. These scores range between zero and one hundred, where higher is better. Second, share holdings of the top three owners in each firm in the sample. All companies that were listed during the sample period are included in the analysis, even if they became listed after the beginning of the sample or if they were delisted before the end of the sample.

ESG scores and financial control variables data are from the LSEG Workspace (formerly Refinitiv Eikon) database. For the ownership data and some CG-related control variables, we utilise the Nordic Database in Corporate Governance, created by the leading universities in the Nordics for quantitative research on corporate governance. The database has been made available by the Center for Corporate Governance (CCG) at the Copenhagen Business School. According to the Center, the data were collected through various data sources and methods, harmonised, and quality checked.[1] The database includes data up to the year 2019, and for this study, it has been augmented with newly collected data for 2020 to 2024 from the Moody's Orbis database. In this research, we focus on the three largest owners, labelled here as blockholders, based on the fraction (percentage) of share capital directly owned at the end of the year. Overall, our sample consists of 5302 firm-year unbalanced observations for 660 firms (of which 85, 78, 7, 108, and 382 are from Denmark, Finland, Iceland, Norway, and Sweden, respectively).

3.2. Empirical design

3.2.1. Variables

To understand how the largest owner's investment horizon can influence a firm's ESG performance, we classify the largest blockholders into long-term and short-term categories based on whether they have owned the company's shares for at least three consecutive years prior to the current year. As a result, we have an annual indicator variable, $Longterm\_Owner1_{it}$, related to ownership type. This indicator variable gets a value of one if the largest investor can be considered a long-term investor. Unlike longer thresholds such as the five-year horizon used by (Boubaker et al. 2017), our three-plus-one-year criterion avoids excessive sample reduction and reflects a period sufficient for investors to exert meaningful influence on firm strategy and ESG practices, while still

accounting for shareholder mobility (Gaspar, Massa, and Matos 2005). In addition, we have a matching variable $Share\_Percentage1_{it}$ which represents the percentage of equity share capital owned directly, at the end of the year t in firm i by the largest blockholder. Similar variables are created for the second and third largest owners.

We use several firm characteristics that may affect a firm's ESG performance as control variables. The variables are as follows: return on assets *ROA* as a proxy for financial performance is the earnings before interest and taxes over the total assets of the firm (e.g.Alshorman et al. 2022), the natural logarithm of the book value of total assets of the firm as a measure of *Firm_ Size* (Buallay 2019), the debt-to-equity ratio as a measure of *Leverage* (Grewal et al. 2008), tangible assets (property, plant, and equipment) of a firm over its total assets as a measure of *Tangibility*, and cash and short-term investments of a firm over its total assets as a measure of *CashHolding* (Hu and Zhang 2021). Our final variable is *Sales_growth*, calculated as the percentage change in a firm's sales. It is expected to capture improvement in firm revenue, which can quickly enable the firm to access cash for investment in activities such as ESG (Brush, Bromiley, and Hendrickx 2000). We also include board characteristics, such as board size (i.e. the natural log of the number of board members of the firm) and board gender diversity (i.e. the proportion of female to male on the board of a firm in a year), and country economic factor such as the GDP growth (i.e. the change in gross domestic product in the country where a firm is listed) as control variables.

3.2.2. Model specification

To investigate whether the size of the blockholder's ownership affects a firm's ESG performance, we first estimate the following linear panel regression model.

$$ESG_{it} = \beta_0 + \beta_1 Share\_Percentage_{it} + \boldsymbol{\beta} Controls_{it} + \gamma\, Firm_i + \delta Year_t + \epsilon_{it}, \quad (1)$$

where ESG_{it} is the overall score based on pillar (environmental, social, and governance) scores, which are the relative sum of the category weights in a firm i at time t. In a separate analysis, the overall *ESG* score is replaced with individual pillar scores (E, S, and G) for robustness and to see how the blockholder's ownership influences them separately.

Our initial test variable is $Share\_Percentage_{it}$ which is the percentage of direct shares owned by the largest, second, and third largest blockholders, respectively in a firm i at time t. Control variables, firm, and year-fixed effects are included in all of our regressions. Since our main focus is to examine the impact of owners' investment horizons on the ESG performance, we interact the *Share_Percentage1* variable with the *Longterm_Owner1* indicator variable and re-estimate the model. If this variable is found significant, the largest owner's investment horizon (long-term vs. short-term) can help us explain differences in the ESG.

3.3. Descriptive statistics

Table 1 shows the summary statistics for the main variables used in this paper. The average ESG score of sample firms is 50.18, with a minimum of 1.24 and a maximum of 92.52. The standard deviation is 20.03, which gives us an interesting starting point for the analysis, showing a widespread cross-sectional dispersion in the data, indicating that the ratings cover a wide range. The same can be seen with the individual pillar scores. The average environmental, social, and governance pillar scores are 51.23, 53.22, and 49.18, respectively, and they show even higher standard deviation than the combined score.[2] As such, one can conclude that the data allows for robust conclusions on the influence of owner types on ESG performance because the scores of sample firms are not concentrated in the high or low percentiles.

Long-term and short-term owners in the largest owner group consist of 24% and 76%, respectively, of the observations in our sample. We find similar ownership patterns for the second and third-largest owner groups. Return on assets, cash holding, and revenue as measures of financial performance of the firms are 5%, 13%, and 6%, respectively. The cash holding suggests that the firms, on average, have slack resources that can allow for substantial investment in sustainability projects (Aguilera-Caracuel et al. 2015).

The Pearson correlation matrix is presented in Table 2. Results show that there is a positive (negative) correlation between the long-term (short-term) owners and ESG as well as pillar scores (except governance) for all owner groups. The test of multicollinearity using the variance inflation factors (VIF) shows values lower than five for all the models. This implies an absence of multicollinearity between the variables (Hair et al. 2012).

Table 1. Sample descriptive statistics.

Summary statistics Panel A: ESG	N	Mean	St. Dev.	Min	Median	Max	Skewness	Kurtosis
ESG	4606	50.18	20.03	1.24	51.79	92.52	−0.23	−0.67
Env	4558	51.23	25.98	0	50.26	97.68	−0.09	−1.06
Soc	4606	53.22	22.80	0.90	55.38	96.41	−0.31	−0.77
Gov	4599	49.18	22.66	1.24	49.37	97.43	−0.01	−1.00
Panel B: Ownership variables	N	Mean	St. Dev.	Min	Median	Max	Skewness	Kurtosis
Longterm_Owner1	2980	0.24	0.43	0	1	1	−1.19	−0.58
Shortterm_Owner1	2980	0.76	0.43	0	0	1	1.19	−0.58
Longterm_Owner2	2810	0.33	0.50	0	0	1	0.27	−1.93
Shortterm_Owner2	2810	0.67	0.50	0	1	1	−0.27	−1.93
Longterm_Owner3	2772	0.36	0.48	0	0	1	0.57	−1.68
Shortterm_Owner3	2772	0.64	0.48	0	1	1	−0.57	−1.68
Share_Percentage1	3059	0.08	0.18	0	0.002	0.89	2.72	7.87
Share_Percentage2	3014	0.03	0.07	0	0.001	0.77	4.08	25.72
Share_Percentage3	2825	0.02	0.04	0	0.001	0.47	4.03	23.25
Panel C: Firm characteristics	N	Mean	St. Dev.	Min	Median	Max	Skewness	Kurtosis
ROA	4,594	0.05	0.17	−2.05	0.06	3.71	−0.18	89.19
Firm_Size	4606	20.91	1.92	15.02	21.11	25.73	−0.38	−0.19
Leverage	4596	0.12	0.21	−0.06	0.01	5.71	7.97	164.52
Tangibility	4594	0.21	0.21	0	0.14	0.99	1.34	1.22
CashHolding	4536	0.13	0.16	−0.03	0.08	1.18	2.72	8.64
Sales_Growth	4606	0.06	0.36	−7.03	0.04	7.45	0.31	108.06
Board_Size	4601	4.74	2.95	0.69	3.56	28	1.49	4.17
Board_Diversity	4601	14.45	18.46	0	0.50	75	0.83	−0.78
Bid_Ask_Spread	2201	0.32	0.45	0.02	0.19	9.52	8.18	130.28

Notes: This table presents the descriptive statistics. ESG is the overall sustainability score (weighted average of environmental, social, and governance pillar scores). Env, Soc, and Gov are environmental, social and governance sustainability performance scores, respectively. *Longterm_Owner_k* is an indicator term equal to one when the *k*-th owner is long-term oriented (i.e. holds shares for at least four consecutive years) and zero otherwise (i.e. Shortterm_Owner). *Share_Percentage_k* is the percentage of share(direct) of the *k*-th largest owner. *ROA* is return on assets, defined as EBIT over total assets. *Firm_Size* is the natural log of total assets. *Leverage* is the debt-to-equity ratio. *Tangibility* is the ratio of PPE to total assets. *CashHolding* is the ratio of cash and short-term investments to total assets. *Sales_Growth* is the annual percentage change in sales. *Board_Size* is the natural log of the number of board members. *Board_Diversity* is the proportion of female to male directors. *Bid_Ask_Spread* is the difference between the ask and bid offers divided by their average.

4. Empirical results

4.1. Impact of equity blockholding on ESG performance

We estimate, as our first test, OLS regressions of the firm's ESG performance on ownership of the largest blockholders who have strong incentives to monitor the firm's management in order to increase firm value (Burkart, Gromb, and Panunzi 1997). Table 3 presents the results of the regressions where the dependent variable is the ESG scores[3]

Our key explanatory variable of interest is the percentage of shares owned. In Model 1, the percentage share owned by the largest owner is positively and significantly related to ESG performance, implying that larger blockholding increases the firm's activities in sustainability. This result confirms the findings of previous studies (e.g.Barnea and Rubin 2010). Dimson, Karakaş, and Li (2021) conclude that a two-tier engagement strategy where lead investors combine with supporting investors results in improved environmental and social performance in firms. Contrary to the notion of potential reverse causality outlined in Demsetz (1983), it is noteworthy to say that the largest shareholder within the significant ownership categories already possesses a vested interest in shaping corporate decisions. Therefore, owners' acquisition of these shares is not solely driven by firms' ESG performance considerations. This implies a more deliberate motivation behind the large owners' shareholdings.

In Models 2 and 3, we consider percentage shares of the other two largest owner groups. We find that the percentage of shares of the second-largest owner is positively related to firms' ESG performance, but find no significant relationship for the third-largest owner. More interestingly, the relationship is economically more

Table 2. Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) ESG																			
(2) Env	0.855***																		
(3) Soc	0.909***	0.754***																	
(4) Gov	0.750***	0.451***	0.502***																
(5) Longowner1	0.005	0.002	0.015	−0.003															
(6) Longowner2	0.061**	0.107***	0.072**	−0.030	0.268***														
(7) Longowner3	0.007	0.071**	0.059**	−0.120***	0.249***	0.445***													
(8) Share_Percentage1	0.122***	0.108***	0.079***	0.084***	−0.008	0.059*	−0.039												
(9) Share_Percentage2	0.016	−0.007	0.004	0.016	−0.102***	−0.099***	−0.107***	0.570***											
(10) Share_Percentage3	−0.056*	−0.082**	−0.069**	−0.004	−0.179***	−0.196***	−0.113***	0.437***	0.785***										
(11) ROA	0.214***	0.234***	0.240***	0.070***	−0.023	0.008	0.037**	0.050**	0.0004	−0.006									
(12) Firm_Size	0.640***	0.651***	0.600***	0.394***	0.050*	0.035	−0.022	0.010	−0.122***	−0.179***	0.261***								
(13) Leverage	0.007	0.020	−0.009	0.017	−0.041*	0.001	−0.015	0.261***	0.174***	0.175***	−0.024	0.004							
(14) Tangibility	0.164***	0.206***	0.171***	0.056**	−0.022	0.067**	0.050*	0.129***	0.131***	0.052*	0.103***	0.136***	0.145***						
(15) CashHolding	−0.248***	−0.289***	−0.266***	−0.087***	0.063**	−0.073**	−0.001	−0.032	0.013	0.008	−0.381***	−0.482***	−0.161***	−0.211***					
(16) Sales_Growth	−0.047*	−0.033	−0.057*	−0.029	0.057**	0.068***	0.034	−0.016	−0.010	0.037*	0.031	−0.008	0.031	−0.020	0.010				
(17) Board_Size	0.243***	0.239***	0.196***	0.177***	0.001	0.087***	0.007	0.344***	0.266***	0.101***	0.059**	0.182***	0.338***	0.020	−0.057**	0.034			
(18) Board_Diversity	0.107***	0.061**	0.045*	0.156***	−0.027	0.026	−0.033	0.312***	0.174***	0.172***	0.024	−0.009	0.446***	−0.051	−0.016	0.055*	0.646***		
(19) Bid_Ask_Spread	−0.391***	−0.343***	−0.386***	−0.258***	−0.028	−0.023	0.020	0.065*	0.062*	0.061*	−0.187***	−0.452***	0.119***	−0.073**	0.132***	0.019	−0.043	0.073**	

Notes: This table presents the Pearson correlation matrix. The description of variables is provided in the Appendix.

Table 3. Equity holding and ESG performance of firms.

	ESG		
	(1)	(2)	(3)
Share_Percentage1	0.094***		
	(0.020)		
Share_Percentage2		0.098**	
		(0.038)	
Share_Percentage3			0.035
			(0.076)
ROA	−0.034	−0.015	−0.050
	(0.034)	(0.034)	(0.036)
Firm_Size	0.030***	0.026***	0.020*
	(0.009)	(0.009)	(0.010)
Leverage	−0.016	−0.022	−0.005
	(0.017)	(0.016)	(0.020)
CashHolding	0.022	0.004	0.010
	(0.041)	(0.043)	(0.047)
Tangibility	−0.038	−0.072**	−0.055*
	(0.031)	(0.028)	(0.030)
Sales_Growth	0.001	0.001	0.004
	(0.005)	(0.006)	(0.008)
Board_Size	−0.005**	−0.003	−0.002
	(0.002)	(0.002)	(0.002)
Board_Diversity	0.001	0.001	0.001**
	(0.0003)	(0.0004)	(0.001)
GDP_Growth	−0.151*	−0.081	−0.141
	(0.085)	(0.088)	(0.089)
Firm Fixed-Effect	Yes	Yes	Yes
Year Fixed-Effect	Yes	Yes	Yes
Observations	2,445	2,381	2,325
Adjusted R^2	0.235	0.305	0.333

Notes: This table shows panel regression results for the impact of the ownership size (*Share_Percentage*) of the three largest owners on the firm's ESG performance. ESG is the overall score (weighted average of environmental, social, and governance pillar scores). Controls include ROA, Leverage, CashHolding, Tangibility, Sales_Growth, Board_Size, Board_Diversity, and GDP_Growth. GDP_Growth is the percentage change in the GDP for the country in question. Other variables are defined in Table 1. Firm-level clustered standard errors are in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-sided).

significant with the second-largest owner. This finding supports the studies (e.g.Dimson, Karakaş, and Li 2015) suggesting that investors (institutional) influence the ESG activities of firms through engagements. It further reiterates the conclusion that investor engagement is a more powerful tool for achieving a sustainable capital market (Ringe 2022). Our finding can also be explained by earlier findings (Berk and Van Binsbergen 2022; Broccardo, Hart, and Zingales 2022) arguing that engagement is more effective than divestment in investors' push for an improvement in a firm's ESG performance.

Generally, our findings support prior studies' conclusion that large owners have motives to positively influence the firm's ESG performance. The motivations have been ascribed to the urge for advancement in operational performance (Edmans 2011) and competitive advantage (Aguilera et al. 2006). Some of these competitive advantages include strategic benefits that strengthen the relationship between the firm and stakeholders (e.g. Bénabou and Tirole 2010).

4.2. Ownership horizon and ESG performance: univariate analysis

As an initial analysis of owners' horizon relationship with the firm's ESG performance, we first analyse the difference in means in terms of sustainability and financial performance across short-term or long-term investor categories within the three largest owner groups. The results are shown in Table 4.

Table 4. Mean comparison across owner horizon

	Largest owner group			Second largest owner group			Third largest owner group		
	Long-term	Short-term	Diff in means (1)–(2)	Long-term	Short-term	Diff in means (4)–(5)	Long-term	Short-term	Diff in means (7)–(8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ESG	55.10	52.70	2.40*	55.20	54.20	1.00*	55.80	54.40	1.40**
			(1.99)			(1.95)			(2.25)
Env	54.30	49.00	5.30***	54.90	50.90	4.00**	56.20	51.10	5.10***
			(3.23)			(2.75)			(3.71)
Soc	58.50	54.80	3.7**	58.50	56.70	1.80**	59.10	57.50	1.60**
			(2.72)			(2.55)			(2.34)
Gov	51.00	52.90	−1.90	50.50	54.20	−3.70**	50.30	53.70	−3.40**
			(−1.34)			(−2.91)			(−2.69)
ROA	0.0649	0.0571	0.008	0.0629	0.0554	0.007	0.0639	0.0547	0.009
			(0.887)			(0.91)			(1.09)
Firm_Size	21.70	21.20	0.50***	21.70	21.40	0.30*	21.60	21.50	0.10
			(4.23)			(2.01)			(1.03)
Leverage	0.091	0.084	0.007	0.0967	0.0886	0.008	0.106	0.0855	0.021*
			(0.659)			(0.86)			(2.25)
Tangibility	0.198	0.171	0.027*	0.202	0.170	0.032**	0.205	0.171	0.034***
			(2.32)			(3.15)			(3.41)
CashHolding	0.119	0.114	0.005	0.115	0.122	−0.007	0.119	0.116	0.003
			(0.554)			(−0.79)			(0.47)
Sales_Growth	0.0375	0.0614	−0.023	0.0331	0.0580	−0.025	0.0310	0.0523	−0.021
			(−0.99)			(−1.15)			(−1.04)

Notes: This table shows the two-sample t-test comparing firm sustainability and financial performance based on long-term and short-term owners across the three largest owner groups. T-statistics are reported in parentheses. Variables are defined in Table 1.

There is a positive and statistically significant difference between long and short-term blockholders in the average overall ESG performance. The positive difference suggests that firms with long-term-oriented owners perform better in sustainability. In addition, firms with long-term-oriented owners have higher environmental and social performance than those with short-term owners. This finding supports the conclusion that owners who are in for the long haul have an incentive to exhibit higher ESG involvement to improve and maintain the firm's corporate image and attract new funds (Godfrey, Merrill, and Hansen 2009).

Interestingly, the results show that firms with short-term-oriented largest owners have better governance performance than firms with long-term-oriented owners. This suggests that short-term owners may be more interested in investing in companies with universally accepted good governance practices, whereas long-term owners may favour the ability to control the management directly on a personal level.

In addition, we find the firms with long-term-oriented largest owners are, on average, significantly larger and they have more tangible assets. There is also some evidence that they have more cash holdings, they use less leverage and have lower lower sales growth compared to those companies with short-term-oriented owners.

4.3. The impact of blockholders' ownership horizon on ESG performance of firms

To test if blockholders' investment horizon has an impact on the ESG performance of firms, we estimate Equation (1) with a new right-hand side variable, *Share_Percentage* × *Longterm_Owner* – the interaction of large owners' percentage ownership share with a dummy of value one if the owner has owned the company for three consecutive years prior to the ongoing year.[4] The result of this analysis is presented in Table 5.

The ESG performance of firms is significantly higher only when the largest and second-largest owners are long-term oriented. The implication is that this type of owners supports operations and projects that may take several years, such as those that focus on improving the ESG performance of the firm. This finding also supports the conclusion that owners with a long-term commitment see promoting ESG investment as a tool to maintain sustainable corporate growth (Boubaker et al. 2020). The impact of long-term ownership for the third-largest owners is insignificant, suggesting an inconsequential influence from this group of owners. Naturally, the third-largest owners have less influence on the corporate action of the firm.

To take a closer look at the relationship, we re-estimate the model for each pillar score. The results are shown in Table 6. The presence of a long-term-oriented, largest owner in the firm improves the environmental and social performance of the firm. This is particularly in line with the differentiation strategy that owners may use to appeal to stakeholders, especially where there is a need to avoid economic reactions to environmental and social challenges as a result of weak ESG performance (Gjessing and Syse 2007). Interestingly, if the largest owner is a long-term one, it does not have a significant impact on the governance score. This may reflect the notion that the largest owner has the best ability to monitor the firm even without any formal CG mechanisms. In addition, the more pronounced influence in environmental and social areas of ESG, where investments (e.g. in renewable technologies, employee welfare, or community engagement) can enhance long-term value without undermining their concentrated control (Edmans 2014). Similarly, governance scores may not necessarily improve significantly under long-term blockholders as they may rely on existing institutional safeguards for governance compliance in the region while selectively engaging with ESG areas that align with firm reputation, stakeholder legitimacy, and value preservation (Dyck and Zingales 2004).

If we take a look at the second and third largest owners, the results are somewhat mixed. The social performance of the firm is further enhanced with long-term-oriented owners. On the other hand, the environmental performance of the firm is not significantly affected if the third largest owner group is long-term oriented. The insignificant influence of long-term-oriented owners in this group may be an indication of their interest in economic value added instead.

4.4. Additional consideration and robustness test

To address potential endogeneity concerns, particularly reverse causality between long-term ownership and ESG performance, we consider the instrumental variable approach using the bid-ask spread as an instrument. A stock's associated liquidity and information asymmetry are reflected in the bid-ask spread (Amihud and

Table 5. Ownership concentration, horizon and ESG performance of firms.

	ESG		
	(1)	(2)	(3)
*Share_Percentage*1 × *Longterm_Owner*1	0.093***		
	(0.028)		
*Share_Percentage*2 × *Longterm_Owner*2		0.112***	
		(0.038)	
*Share_Percentage*3 × *Longterm_Owner*3			0.096
			(0.096)
Share_Percentage1	−0.001		
	(0.029)		
Share_Percentage2		0.070	
		(0.059)	
Share_Percentage3			−0.143
			(0.103)
ROA	−0.034	−0.016	−0.051
	(0.034)	(0.034)	(0.036)
Firm_Size	0.029***	0.026***	0.020*
	(0.009)	(0.009)	(0.010)
Leverage	−0.016	−0.022	−0.004
	(0.017)	(0.016)	(0.021)
CashHolding	0.022	0.004	0.007
	(0.041)	(0.043)	(0.047)
Tangibility	−0.038	−0.073**	−0.054*
	(0.031)	(0.028)	(0.031)
Sales_growth	0.001	0.001	0.004
	(0.005)	(0.005)	(0.008)
Board_Size	−0.005**	−0.003	−0.002
	(0.002)	(0.002)	(0.002)
Board_Diversity	0.001	0.001	0.001**
	(0.0003)	(0.0004)	(0.001)
GDP_Growth	−0.151*	−0.079	−0.142
	(0.085)	(0.088)	(0.089)
Firm and Year FE	Yes	Yes	Yes
Observations	2445	2,381	2,325
Adjusted R^2	0.237	0.305	0.333

Notes: This table shows the estimation results for the model where the owners' horizon is allowed to interact with blockholdings on the ESG performance of the firm. *Share_Percentage_k* is the ownership size of the *k*th largest owner. *Share_Percentage_k* × *Longterm_Owner_k* is an indicator term equal to one when the *k*th owner is long-term oriented and zero otherwise. Other variables are as defined in Table 1. Firm-level clustered standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels (two-sided). The last rows report fixed effects, sample size, and adjusted R^2.

Mendelson 1986). A higher bid-ask spread indicates lower liquidity, which can deter short-term trading due to higher transaction costs. This environment tends to attract long-term investors who are less sensitive to immediate liquidity needs and more focussed on the firm's fundamental value over time. Consequently, there is a strong conceptual link between the bid-ask spread and the likelihood of long-term ownership, satisfying the relevance criterion for a valid instrument.[5] In addition, the bid-ask spread is also a direct measure of information asymmetry in financial markets, which affects the incentives of different investor types to hold large stakes (Chowdhury, Mollah, and Al Farooque 2018). This financing channel affects investor participation and holding horizons but remains orthogonal to unobserved ESG policies, thereby confirming the instrument's validity (Ferreira and Matos 2008).

In practice, we use the Two-Stage Residual Inclusion (2SRI) method of instrumental variable approach to effectively control for potential endogeneity arising from factors such as reverse causality and omitted variable bias. The approach first involves estimating a probit model for the potentially endogenous binary variable–long-term ownership–using instrumental variable (bid-ask) and exogenous controls to obtain generalised residuals. In the second stage, these residuals are included alongside the endogenous variable in the ESG performance

Table 6. Owners horizon and E/S/G performance of firms.

	Env (1)	Soc (2)	Gov (3)	Env (4)	Soc (5)	Gov (6)	Env (7)	Soc (8)	Gov (9)
Share_Percentage1 × *Longterm_Owner1*	0.108*	0.104*	0.013						
	(0.057)	(0.058)	(0.062)						
Share_Percentage2 × *Longterm_Owner2*				0.101*	0.329**	0.045			
				(0.053)	(0.132)	(0.103)			
Share_Percentage3 × *Longterm_Owner3*							0.341	0.594**	−0.416
							(0.215)	(0.267)	(0.300)
Share_Percentage1	−0.013	−0.0001	−0.051						
	(0.046)	(0.047)	(0.059)						
Share_Percentage2				−0.128	0.049	−0.097			
				(0.136)	(0.097)	(0.173)			
Share_Percentage3							−0.009	−0.021	0.116
							(0.186)	(0.256)	(0.237)
ROA	0.006	0.108**	−0.234***	0.087	0.063	−0.261***	0.091	0.080	−0.307***
	(0.047)	(0.051)	(0.055)	(0.055)	(0.056)	(0.060)	(0.059)	(0.063)	(0.066)
Firm_Size	0.094***	0.080***	0.074***	0.100***	0.083***	0.070***	0.103***	0.085***	0.071***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)
Leverage	−0.144***	−0.093	0.063	−0.159***	−0.105	0.034	−0.148***	−0.053	−0.035
	(0.049)	(0.069)	(0.052)	(0.055)	(0.080)	(0.058)	(0.057)	(0.079)	(0.066)
CashHolding	0.096**	0.134***	0.281***	0.107**	0.156***	0.301***	0.146***	0.157***	0.347***
	(0.038)	(0.035)	(0.043)	(0.044)	(0.039)	(0.049)	(0.047)	(0.044)	(0.056)
Tangibility	0.214***	0.040	−0.033	0.213***	−0.003	−0.044	0.216***	0.002	−0.020
	(0.028)	(0.027)	(0.034)	(0.031)	(0.030)	(0.038)	(0.033)	(0.032)	(0.042)
Sales_growth	−0.037*	−0.010	−0.013	−0.032	−0.013	−0.010	−0.051*	−0.013	−0.007
	(0.020)	(0.019)	(0.019)	(0.022)	(0.019)	(0.020)	(0.030)	(0.025)	(0.026)
Board_Size	0.006**	0.004	−0.008**	0.007***	0.0004	−0.008**	0.009***	0.004	−0.009**
	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Board_Diversity	−0.0002	0.002***	0.003***	−0.0004	0.002**	0.002*	0.00002	0.003***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
GDP_Growth	−0.374*	−0.074	−0.103	−0.357	−0.014	0.020	−0.557**	−0.163	−0.037
	(0.211)	(0.202)	(0.231)	(0.220)	(0.209)	(0.239)	(0.233)	(0.219)	(0.245)
Firm and Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,439	2,445	2,445	2,375	2,381	2,381	2,319	2,325	2,325
Adjusted R^2	0.286	0.196	0.013	0.258	0.134	0.075	0.259	0.110	0.103

Notes: This table shows the impact of owners' horizons on the E, S, and G pillar scores of the firm. Variables are defined in Tables 1 and 5. Firm and year fixed effects are included. Firm-level clustered standard errors are reported in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels (two-sided).

regression. This method corrects for the correlation between the endogenous variable and the error term, allowing for a consistent estimation of the causal effect. By incorporating the residuals, we account for unobserved factors influencing both long-term ownership and ESG performance, effectively isolating the exogenous variation in long-term ownership (Terza, Basu, and Rathouz 2008; Wooldridge 2015). The results are shown in Table 7.

The results reaffirm the positive and significant impact of long-term ownership on ESG performance, consistent with earlier estimates (fixed-effects panel regressions) presented in this study. The persistence of this relationship after addressing endogeneity through 2SRI strengthens the argument that long-term investors play a pivotal role in enhancing a firm's sustainability practices. It indicates that the observed relationship is robust and represents a genuine causal effect rather than a spurious correlation. This finding aligns with prior research indicating that long-term investors influence corporate strategies toward greater sustainability (Dyck et al. 2019; Flammer and Bansal 2017). By mitigating endogeneity concerns using the 2SRI method, the study provides more credible evidence that long-term investors actively contribute to improving ESG standards within firms, highlighting the importance of investor horizons in shaping corporate sustainability initiatives.

Table 7. Instrumental variable analysis.

	ESG		
	(1)	(2)	(3)
Share_Percentage × Longterm_Owner	0.040**	0.028**	0.165
	(0.015)	(0.013)	(0.166)
Share_Percentage	0.021	0.018	0.112
	(0.028)	(0.026)	(0.126)
ROA	−0.005	−0.003	−0.019
	(0.028)	(0.028)	(0.031)
Firm_Size	0.082***	0.076***	0.083***
	(0.004)	(0.005)	(0.004)
Leverage	−0.207***	−0.194***	−0.217***
	(0.046)	(0.047)	(0.047)
CashHolding	0.184***	0.196***	0.177***
	(0.045)	(0.044)	(0.042)
Tangibility	0.017	−0.012	0.005
	(0.033)	(0.038)	(0.035)
Sales_Growth	−0.003	−0.036	−0.011
	(0.020)	(0.028)	(0.020)
Board_Size	0.005**	0.002	0.003
	(0.002)	(0.003)	(0.003)
Board_Diversity	0.002***	0.002***	0.002***
	(0.000)	(0.001)	(0.001)
GDP_Growth	−0.170	0.116	−0.296
	(0.189)	(0.254)	(0.240)
Lambda	0.007	−0.038	−0.037
	(0.011)	(0.027)	(0.039)
Constant	−1.184***	−1.170***	−1.294***
	(0.080)	(0.078)	(0.121)
Num. Obs.	1,506	1,506	1,506
Adjusted R^2	0.583	0.584	0.583
AIC	−1690.4	−1692.3	−1691.2
BIC	−1635.5	−1637.4	−1636.3
Log Likelihood	358.209	359.168	358.621
RMSE	0.12	0.12	0.12

Notes: This table reports the **second-stage** estimates from a two-stage residual inclusion (2SRI) instrumental variable regression. The dependent variable is the overall ESG score. The main explanatory variables are *Share_Percentage* and *Longterm_Owner*, the percentage of shares owned and the long-term ownership status, respectively. Model (1) reports the results using values for the largest, model (2) for the second largest, and model (3) for the third largest owners. *Bid_Ask_Spread* is the instrument used in the first stage (results are reported in the Appendix). *Lambda* denotes the included residual from stage one for the owner group in question. Other controls are defined as in Table 3. Firm-level clustered standard errors are in parentheses. ***, **, * denote significance at the 1%, 5%, and 10% levels (two-sided).

5. Summary and conclusion

Using data on publicly listed Nordic firms, we investigate whether blockholding and blockholders' investment horizon affect a firm's sustainability performance, as measured by the ESG rating. We find that the proportion of shares held by the top two largest blockholders is positively and significantly related to the firms' ESG performance, confirming our first hypothesis. We also find evidence in favour of our second hypothesis: Firms' ESG rating performance is higher when the large owners are long-term oriented, i.e. they are committed to owning the firm for the long term. The result is strongest for the largest owner group.

Our study contributes to the body of research on ownership and ownership horizons. In particular, our long-term ownership indicator differs from that of previous studies, which define long-term investors based on some predefined categorisation using some characteristics (e.g. investment strategies or style, clientele, or beneficiaries). Using these predefined categories can be problematic at times, as owners labelled as long-term might not always invest in a long-term fashion; some of the investments can be purely financial and thus short-term. We have utilised the observed (realised) ownership horizon instead. We argue that it is better at matching investors'

true commitment to developing the company in the long run. If the owner's investment horizon is to affect the ESG, the intuition and results suggest that the ownership has to last several years. Having a long-term owner in name only, or an owner for a short period, is unlikely to have an impact on the ESG.

The findings of this study bring forward important practical implications for both policymakers and corporate governance practitioners. Regulators and companies may consider taking into account the ownership horizon in the stewardship guidelines/principles and governance structures to better capture the alignment between ownership stability and long-term corporate objectives. For institutional investors, the results highlight that sustained, long-term engagement can foster conditions that are more favourable for value creation. Likewise, corporate boards could view stable ownership as a strategic advantage that enhances continuity in ESG initiatives and strengthens accountability in sustainability commitments.

As always, this study is not without limitations. The raw data provide no information on the type of owners other than their names. As a result, the traditional categorisation of the owners into long and short-term categories is difficult. It would, however, be interesting to conduct a study where both approaches to investor categorisation are used. Cross-tabulation of the investors could offer interesting insights even in its own right. This is left for future study.

Notes

1. A detailed data description, including sources and collection methods, is available on request from the CCG.
2. Note that environmental pillar scores are not available for all ESG-scored firms for all years; if this has happened, LSEG has reported a zero for the year.
3. We tested a restricted version of the models and the results are similar, confirming that multicollinearity between variables is not a concern for our models.
4. We also estimate the model requiring only two years of prior ownership. In a separate analysis, we classify owners into short or long-term categories from the beginning of a three-year holding period, i.e. ex ante. The results (available upon request) in both cases align with those reported here, and at times with even higher significance.
5. Our first-stage regression analysis (result are reported in the Internet Appendix) confirms the instrument's relevance: the coefficient on the bid-ask spread is statistically significant at the $p < 0.05$ level and the model exhibits a higher adjusted R^2, indicating a strong association with long-term ownership and improved fit when the bid-ask spread is included (Stock and Yogo 2002). The significance of the residuals in the second-stage regression indicates that long-term ownership is endogenous, reinforcing the necessity of using an instrumental variable approach.

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Data availability statement

The ownership data is mostly provided by the Center for Corporate Governance, Copenhagen Business School. Additional data is downloaded from Moody's Orbis database and LSEG Workspace Datastream. Restrictions apply to the availability of these data.

Disclosure statement

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References

Aboud, A., and A. Diab. 2022. "Ownership Characteristics and Financial Performance: Evidence from Chinese Split-Share Structure Reform." *Sustainability* 14 (12): 7240–7257. https://doi.org/10.3390/su14127240.

Aguilera, R. V., C. A. Williams, J. M. Conley, and D. E. Rupp. 2006. "Corporate Governance and Social Responsibility: A Comparative Analysis of the UK and the US." *Corporate Governance: An International Review* 14 (3): 147–158. https://doi.org/10.1111/corg.2006.14.issue-3.

Aguilera-Caracuel, J., J. Guerrero-Villegas, M. D. Vidal-Salazar, and B. L. Delgado-Márquez. 2015. "International Cultural Diversification and Corporate Social Performance in Multinational Enterprises: The Role of Slack Financial Resources." *Management International Review* 55:323–353. https://doi.org/10.1007/s11575-014-0225-4.

Alshorman, S., S. Qaderi, T. Alhmoud, and R. Meqbel. 2022. "The Role of Slack Resources in Explaining the Relationship between Corporate Social Responsibility Disclosure and Firm Market Value: A Case from an Emerging Market." *Journal of Sustainable Finance & Investment* 14 (2): 1–20.

Amihud, Y., and H. Mendelson. 1986. "Asset Pricing and the Bid-Ask Spread." *Journal of Financial Economics* 17 (2): 223–249. https://doi.org/10.1016/0304-405X(86)90065-6.

Anderson, R. C., and D. M. Reeb. 2003. "Founding-Family Ownership and Firm Performance: Evidence from the S&P 500." *The Journal of Finance* 58 (3): 1301–1328. https://doi.org/10.1111/jofi.2003.58.issue-3.

Barnea, A., and A. Rubin. 2010. "Corporate Social Responsibility as a Conflict between Shareholders." *Journal of Business Ethics* 97 (1): 71–86. https://doi.org/10.1007/s10551-010-0496-z.

Bénabou, R., and J. Tirole. 2010. "Individual and Corporate Social Responsibility." *Economica* 77 (305): 1–19. https://doi.org/10.1111/ecca.2010.77.issue-305.

Berk, J. B., and J. H. Van Binsbergen. 2022. "Regulation of Charlatans in High-Skill Professions." *The Journal of Finance* 77 (2): 1219–1258. https://doi.org/10.1111/jofi.v77.2.

Boubaker, S., A. Cellier, R. Manita, and A. Saeed. 2020. "Does Corporate Social Responsibility Reduce Financial Distress Risk?" *Economic Modelling* 91:835–851. https://doi.org/10.1016/j.econmod.2020.05.012.

Boubaker, S., L. Chourou, D. Himick, and S. Saadi. 2017. "It's about Time! the Influence of Institutional Investment Horizon on Corporate Social Responsibility." *Thunderbird International Business Review*59 (5): 571–594. https://doi.org/10.1002/tie.2017.59.issue-5.

Bozec, Y., and R. Bozec. 2007. "Ownership Concentration and Corporate Governance Practices: Substitution or Expropriation Effects?" *Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration* 24 (3): 182–195. https://doi.org/10.1002/cjas.v24:3.

Broccardo, E., O. Hart, and L. Zingales. 2022. "Exit versus Voice." *Journal of Political Economy* 130 (12): 3101–3145. https://doi.org/10.1086/720516.

Brunzell, T., E. Liljeblom, and M. Vaihekoski. 2015. "Short-term Expectations in Listed Firms: The Effects of Different Owner Types." *Journal of International Financial Management & Accounting* 26 (3): 223–256. https://doi.org/10.1111/jifm.2015.26.issue-3.

Brush, T. H., P. Bromiley, and M. Hendrickx. 2000. "The Free Cash Flow Hypothesis for Sales Growth and Firm Performance." *Strategic Management Journal* 21 (4): 455–472. https://doi.org/10.1002/(ISSN)1097-0266.

Buallay, A. 2019. "Is Sustainability Reporting (ESG) Associated with Performance? Evidence from the European Banking Sector." *Management of Environmental Quality: An International Journal* 30 (1): 98–115. https://doi.org/10.1108/MEQ-12-2017-0149.

Burkart, M., D. Gromb, and F. Panunzi. 1997. "Large Shareholders, Monitoring, and the Value of the Firm." *The Quarterly Journal of Economics* 112 (3): 693–728. https://doi.org/10.1162/003355397555325.

Bushee, B. J. 1998. "The Influence of Institutional Investors on Myopic R&D Investment Behavior." *Accounting Review* 73 (3): 305–333.

Cespa, G., and G. Cestone. 2007. "Corporate Social Responsibility and Managerial Entrenchment." *Journal of Economics & Management Strategy* 16 (3): 741–771.
Cho, C. H., M. Laine, R. W. Roberts, and M. Rodrigue. 2015. "Organized Hypocrisy, Organizational Façades, and Sustainability Reporting." *Accounting, Organizations and Society*40:78–94. https://doi.org/10.1016/j.aos.2014.12.003.
Chowdhury, A., S. Mollah, and O. Al Farooque. 2018. "Insider-Trading, Discretionary Accruals and Information Asymmetry." *The British Accounting Review* 50 (4): 341–363. https://doi.org/10.1016/j.bar.2017.08.005.
Chowdhury, A., M. Vaihekoski, and H. Yahya. 2023. "Blockholding, Ownership Horizon, and Firms' ESG Performance: Nordic Evidence." In *EFMA Annual Meeting*, Cardiff University, UK.
Cox, P., S. Brammer, and A. Millington. 2004. "An Empirical Examination of Institutional Investor Preferences for Corporate Social Performance." *Journal of Business Ethics* 52 (1): 27–43. https://doi.org/10.1023/B:BUSI.0000033105.77051.9d.
Crane, A. D., S. Michenaud, and J. P. Weston. 2016. "The Effect of Institutional Ownership on Payout Policy: Evidence from Index Thresholds." *The Review of Financial Studies* 29 (6): 1377–1408. https://doi.org/10.1093/rfs/hhw012.
Demsetz, H. 1983. "The Structure of Ownership and the Theory of the Firm." *The Journal of Law and Economics* 26 (2): 375–390. https://doi.org/10.1086/467041.
Demsetz, H., and K. Lehn. 1985. "The Structure of Corporate Ownership: Causes and Consequences." *Journal of Political Economy* 93 (6): 1155–1177. https://doi.org/10.1086/261354.
Dimson, E., O. Karakaş, and X. Li. 2015. "Active Ownership." *The Review of Financial Studies* 28 (12): 3225–3268. https://doi.org/10.1093/rfs/hhv044.
Dimson, E., O. Karakaş, and X. Li. 2021. "Coordinated Engagements." *European Corporate Governance Institute–Finance Working Paper*, (721).
Donaldson, L., and J. H. Davis. 1991. "Stewardship Theory or Agency Theory: CEO Governance and Shareholder Returns." *Australian Journal of Management* 16 (1): 49–64. https://doi.org/10.1177/031289629101600103.
Doshi, M., R. Jain, D. Sharma, D. Mukherjee, and S. Kumar. 2024. "Does Ownership Influence ESG Disclosure Scores?" *Research in International Business and Finance* 67:102122. https://doi.org/10.1016/j.ribaf.2023.102122.
Downs, D. H., and D. W. Sommer. 1999. "Monitoring, Ownership, and Risk-Taking: The Impact of Guaranty Funds." *Journal of Risk and Insurance* 66 (3): 477–497. https://doi.org/10.2307/253557.
Dyck, A., K. V. Lins, L. Roth, and H. F. Wagner. 2019. "Do Institutional Investors Drive Corporate Social Responsibility? International Evidence." *Journal of Financial Economics* 131 (3): 693–714. https://doi.org/10.1016/j.jfineco.2018.08.013.
Dyck, A., and L. Zingales. 2004. "Private Benefits of Control: An International Comparison." *The Journal of Finance* 59 (2): 537–600. https://doi.org/10.1111/jofi.2004.59.issue-2.
Edmans, A. 2011. "Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices." *Journal of Financial Economics* 101 (3): 621–640. https://doi.org/10.1016/j.jfineco.2011.03.021.
Edmans, A. 2014. "Blockholders and Corporate Governance." *Annual Review of Financial Economics* 6 (1): 23–50. https://doi.org/10.1146/financial.2014.6.issue-1.
Eliwa, Y., and M. E. Elmaghrabi. 2025. "Investment Horizons and ESG Decoupling: Distinct Roles of Long-Term and short-term Institutional Investors." *Economics Letters* 247:112207. https://doi.org/10.1016/j.econlet.2025.112207.
Ferreira, M. A., and P. Matos. 2008. "The Colors of Investors' Money: The Role of Institutional Investors around the World." *Journal of Financial Economics* 88 (3): 499–533. https://doi.org/10.1016/j.jfineco.2007.07.003.
Flammer, C., and P. Bansal. 2017. "Does a Long-Term Orientation Create Value? Evidence from a Regression Discontinuity." *Strategic Management Journal*38 (9): 1827–1847. https://doi.org/10.1002/smj.2017.38.issue-9.
Gaspar, J.-M., M. Massa, and P. Matos. 2005. "Shareholder Investment Horizons and the Market for Corporate Control." *Journal of Financial Economics* 76 (1): 135–165. https://doi.org/10.1016/j.jfineco.2004.10.002.
Gillan, S., and L. T. Starks. 2003. "Corporate Governance, Corporate Ownership, and the Role of Institutional Investors: A Global Perspective." *Weinberg Center for Corporate Governance Working Paper*, (2003-01).
Gjessing, O. P. K., and H. Syse. 2007. "Norwegian Petroleum Wealth and Universal Ownership." *Corporate Governance: An International Review* 15 (3): 427–437. https://doi.org/10.1111/corg.2007.15.issue-3.
Gjølberg, M. 2013. "Nordic Companies–Global Pioneers in CSR." *CSR and beyond: A Nordic Perspective. Oslo: Cappelen Damm*.
Gloßner, S. 2019. "Investor Horizons, Long-Term Blockholders, and Corporate Social Responsibility." *Journal of Banking & Finance* 103:78–97. https://doi.org/10.1016/j.jbankfin.2019.03.020.
Godfrey, P. C., C. B. Merrill, and J. M. Hansen. 2009. "The Relationship between Corporate Social Responsibility and Shareholder Value: An Empirical Test of the Risk Management Hypothesis." *Strategic Management Journal* 30 (4): 425–445. https://doi.org/10.1002/smj.v30:4.
Grewal, R., A. Chakravarty, M. Ding, and J. Liechty. 2008. "Counting Chickens before the Eggs Hatch: Associating New Product Development Portfolios with Shareholder Expectations in the Pharmaceutical Sector." *International Journal of Research in Marketing* 25 (4): 261–272. https://doi.org/10.1016/j.ijresmar.2008.07.001.
Grundei, J. 2008. "Are Managers Agents or Stewards of Their Principals? Logic, Critique, and Reconciliation of Two Conflicting Theories of Corporate Governance." *Jahrbuch der Betriebswirtschaft*58:141–166. https://doi.org/10.1007/s11301-008-0038-2.
Hair, J. F., M. Sarstedt, C. M. Ringle, and J. A. Mena. 2012. "An Assessment of the Use of Partial Least Squares Structural Equation Modeling in Marketing Research." *Journal of the Academy of Marketing Science* 40 (3): 414–433. https://doi.org/10.1007/s11747-011-0261-6.

Hansen, J. L. 2023. "The Nordic Approach to Corporate Governance and ESG." *Research Handbook on Environmental, Social, and Corporate Governance, Forthcoming, Nordic & European Company Law Working Paper*, (23-03).
Harford, J., A. Kecskés, and S. Mansi. 2018. "Do Long-Term Investors Improve Corporate Decision Making?" *Journal of Corporate Finance* 50:424–452. https://doi.org/10.1016/j.jcorpfin.2017.09.022.
Hu, S., and Y. Zhang. 2021. "COVID-19 Pandemic and Firm Performance: Cross-Country Evidence." *International Review of Economics & Finance* 74:365–372. https://doi.org/10.1016/j.iref.2021.03.016.
Ioannou, I., and G. Serafeim. 2012. "What Drives Corporate Social Performance? The Role of Nation-Level Institutions." *Journal of International Business Studies* 43 (9): 834–864. https://doi.org/10.1057/jibs.2012.26.
Kolk, A., and R. Van Tulder. 2010. "International Business, Corporate Social Responsibility and Sustainable Development." *International Business Review* 19 (2): 119–125. https://doi.org/10.1016/j.ibusrev.2009.12.003.
Kolsi, M. C., and R. Muqattash. 2020. "Board Characteristics, Ownership Structure and Corporate Social Responsibility Disclosures: Evidence from ADX-Listed Companies." *IUP Journal of Corporate Governance* 19 (2): 7–31.
Krueger, P., Z. Sautner, and L. T. Starks. 2020. "The Importance of Climate Risks for Institutional Investors." *The Review of Financial Studies* 33 (3): 1067–1111. https://doi.org/10.1093/rfs/hhz137.
La Porta, R., F. Lopez-de Silanes, A. Shleifer, and R. Vishny. 2000. "Investor Protection and Corporate Governance." *Journal of Financial Economics* 58 (1-2): 3–27. https://doi.org/10.1016/S0304-405X(00)00065-9.
Lavin, J. F., and A. A. Montecinos-Pearce. 2021. "ESG Disclosure in an Emerging Market: An Empirical Analysis of the Influence of Board Characteristics and Ownership Structure." *Sustainability* 13 (19): 10498. https://doi.org/10.3390/su131910498.
Li, Z., P. Wang, and T. Wu. 2021. "Do Foreign Institutional Investors Drive Corporate Social Responsibility? Evidence from Listed Firms in China." *Journal of Business Finance & Accounting* 48 (1-2): 338–373. https://doi.org/10.1111/jbfa.v48.1-2.
Liang, H., and L. Renneboog. 2017. "On the Foundations of Corporate Social Responsibility." *The Journal of Finance* 72 (2): 853–910. https://doi.org/10.1111/jofi.2017.72.issue-2.
Lin, Y. R., and X. M. Fu. 2017. "Does Institutional Ownership Influence Firm Performance? Evidence from China." *International Review of Economics & Finance* 49:17–57. https://doi.org/10.1016/j.iref.2017.01.021.
Mahoney, L. S., L. Thorne, L. Cecil, and W. LaGore. 2013. "A Research Note on Standalone Corporate Social Responsibility Reports: Signaling or Greenwashing?" *Critical Perspectives on Accounting* 24 (4-5): 350–359. https://doi.org/10.1016/j.cpa.2012.09.008.
McCahery, J. A., Z. Sautner, and L. T. Starks. 2016. "Behind the Scenes: The Corporate Governance Preferences of Institutional Investors." *The Journal of Finance* 71 (6): 2905–2932. https://doi.org/10.1111/jofi.2016.71.issue-6.
Morck, R., A. Shleifer, and R. W. Vishny. 1988. "Management Ownership and Market Valuation: An Empirical Analysis." *Journal of Financial Economics* 20:293–315. https://doi.org/10.1016/0304-405X(88)90048-7.
Rees, W., and T. Rodionova. 2015. "The Influence of Family Ownership on Corporate Social Responsibility: An International Analysis of Publicly Listed Companies." *Corporate Governance: An International Review* 23 (3): 184–202. https://doi.org/10.1111/corg.v23.3.
Ringe, W.-G. 2022. "Investor-Led Sustainability in Corporate Governance." *Annals of Corporate Governance* 7 (2): 93–151. https://doi.org/10.1561/109.00000038.
Shleifer, A., and R. W. Vishny. 1986. "Large Shareholders and Corporate Control." *Journal of Political Economy* 94 (3, Part 1): 461–488. https://doi.org/10.1086/261385.
Shleifer, A., and R. W. Vishny. 1997. "A Survey of Corporate Governance." *The Journal of Finance* 52 (2): 737–783. https://doi.org/10.1111/jofi.1997.52.issue-2.
Stock, J. H., and M. Yogo. 2002. "Testing for Weak Instruments in Linear IV Regression".
Strand, R., R. E. Freeman, and K. Hockerts. 2015. "Corporate Social Responsibility and Sustainability in Scandinavia: An Overview." *Journal of Business Ethics* 127 (1): 1–15. https://doi.org/10.1007/s10551-014-2224-6.
Terza, J. V., A. Basu, and P. J. Rathouz. 2008. "Two-Stage Residual Inclusion Estimation: Addressing Endogeneity in Health Econometric Modeling." *Journal of Health Economics* 27 (3): 531–543. https://doi.org/10.1016/j.jhealeco.2007.09.009.
Wang, Y., Y. Lin, X. Fu, and S. Chen. 2023. "Institutional Ownership Heterogeneity and ESG Performance: Evidence from China." *Finance Research Letters* 51:103448. https://doi.org/10.1016/j.frl.2022.103448.
Wooldridge, J. M. 2015. "Control Function Methods in Applied Econometrics." *Journal of Human Resources* 50 (2): 420–445. https://doi.org/10.3368/jhr.50.2.420.
Wu, S., X. Li, X. Du, and Z. Li. 2022. "The Impact of ESG Performance on Firm Value: The Moderating Role of Ownership Structure." *Sustainability* 14 (21): 14507. https://doi.org/10.3390/su142114507.
Yin, C., C. Ward, and S. Tsolacos. 2018. "Motivated Monitoring: The Importance of the Institutional Investment Horizon." *International Review of Financial Analysis* 60:197–212. https://doi.org/10.1016/j.irfa.2018.08.011.

Appendix. Variable definition

ESG variables	
ESG	The overall environmental, social, and governance score.
Env	The environmental pillar score of a firm's ESG.
Soc	The social pillar score of a firm's ESG.
Gov	The governance pillar score of a firm's ESG.
Ownership variables	
Longterm_Owner1	Indicator variable that equals ond if a firm′s largest owner is long-term and zero otherwise. Long-term investors (blockholders) are defined as those who have owned the shares for at least the three previous years and the current one.
Share_Percentage1	The percentage of shares directly owned by the largest owner.
Control variables	*Similar variables are created for the second and third largest owners.*
ROA	The earnings before interest and taxes over the total assets of the firm is the measure of profitability.
Firm_Size	The natural logarithm of total assets of the firm.
Leverage	The debt-to-equity ratio of the firm.
Tangibility	The plant, property, and equipment scaled with the total assets of the firm.
CashHolding	The value of cash and short-term investment scaled with the total assets of the firm.
Sales_Growth	The percentage change in firm sales.
Board_Size	The natural log of the number of board members of the firm.
Board_Diversity	The percentage proportion of female members on the board of a firm in a year.
GDP_Growth	The percentage change in the gross domestic product of the country where the firm is listed (if dual-listed, the country of primary listing is used).
Bid_Ask_Spread	The difference between the ask and bid offers divided by their average. Used only if both offers are available for the same (year-end) day.