ESG PERFORMANCE AND FIRM VALUE: THE MODERATING ROLE OF OWNERSHIP CONCENTRATION

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Abstract

The shift towards sustainability has resulted in more disclosures regarding environmental, social, and governance (ESG) issues. This study explores how ESG scores impact firm value in the presence of concentrated ownership. The sample consists of 15,640 firm-year observations across 46 countries from 2011–2020. The results of this study show that the ESG score has a positive association with the firm value, supporting the stakeholder theory. Further results indicate that ownership concentration (OC) has a negative moderation effect on the association between ESG and firm value, supporting the entrenchment effect. The results are consistent with the alternative measures of OC The results hold for the two-stage least squares (2SLS) model used to address any endogeneity issue between ESG score and firm value.

Keywords: Refinitiv ESG Score, Stakeholder Theory, Expropriation Hypothesis, Ownership Concentration, Herfindahl-Hirschman Index, Tobin's Q

Authors' individual contribution: Conceptualization — A.S. and A.; Methodology — A.S. and A.; Software — A.S.; Formal Analysis — A.S.; Investigation — A.S. and A.; Writing — Original Draft — A.S.; Writing — Review & Editing — A.S. and A.; Supervision — A.

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1. INTRODUCTION

The increasing awareness towards sustainability issues has resulted in firms disclosing more information on environmental, social, and governance (ESG) activities. The Governance and Accountability Institute's (2021) research reports that 92% of the S&P 500 companies published a sustainability report in 2020. This is a significant growth when compared to 20% of the S&P 500 companies publishing sustainability reports in 2011. ESG practices adoption and their disclosures benefit firms in various ways. Companies committed to sustainability could better mitigate ESG-related risks (Aouadi & Marsat, 2018), have better access to capital and lower cost of capital (El Ghoul et al., 2011), have more efficient organizational processes (Eccles et al., 2014), and promote shareholder welfare which, in return, increases their firm value (McWilliams & Siegel, 2001; Fatemi et al., 2018). ESG practices can also enhance customer loyalty (Kucukusta et al., 2013; Park et al., 2014), organisational commitment (Brammer et al., 2007) as well as help in increasing a firm reputation (González-Rodríguez et al., 2019). Thus, these activities benefit the environment, customers, society, and firms.

ESG is gaining interest from many researchers as responsible-sustainable business practices are likely to be associated with a firm value (Aouadi & Marsat, 2018; Daugaard, 2020; Nekhili et al., 2021). Studies on the link between corporate social responsibility (CSR) and firm value has been evolving for decades (Carroll, 1991; Orlitzky et al., 2003; McWilliams & Siegel, 2001), but recent emphasis on responsible-sustainable practices and their reporting has attracted a renewed interest to understand the link between ESG and the firm performance (Gillan et al., 2021). Interestingly results of these investigations report both positive and negative associations between firm value and ESG performance making it inconclusive so far.

There are diverse arguments present in the literature supporting negative relationships (Groening & Kanuri, 2013) as well as positive relationships (Harjoto & Jo, 2015; Ferrell et al., 2016). For instance, studies that have noted a negative association between ESG scores and firm performance (Groening & Kanuri, 2013) argued that managers engage in ESG actions for their benefit (Barnea & Rubin, 2010). On the other hand, researchers who have found a positive association support the stakeholder theory (Albitar et al., 2020).

The purpose of this study is to substantiate the existing results with the argument that the principal causes of a dubious association between any two variables are due to some unobserved channels which moderate the direct relationship (Servaes & Tamayo, 2013; Nekhili et al., 2021). Existing studies exploring the moderation effect on ESG-firm performance association have considered the role of customer awareness (Servaes & Tamayo, 2013), chief executive officer (CEO) power (Li et al., 2018), ESG investors (Chen & Xie, 2022), disclosure (Fatemi et al., 2018), employee board representation (Nekhili et al., 2021), and governance mechanisms (Albitar et al., 2020). This paper proposes ownership concentration (OC) as a moderating variable.

The moderation effect of OC on the link between ESG and firm value can be supported by the expropriation hypothesis. The expropriation hypothesis propounds that controlling shareholders influence management decisions (La Porta et al., 1999) and expropriate the rights of minority shareholders (Claessens et al., 2002) to maximise their profits. Large shareholders avoid investing in ESG activities as it does not fulfil their interests (Dam & Scholtens, 2013). Therefore, OC could result in particular ESG disclosures and can also influence decision-making on the ESG policies of firms (Dam & Scholtens, 2013). Hence, this paper proposes that the bi-directional link between ESG and the firm value noted in the literature is due to the moderation effect of OC.

The structure of this paper is as follows. Section 2 covers the literature review. Section 3 discusses the methodology. Section 4 presents the results. Section 5 provides a discussion of the results, and Section 6 concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

ESG research is largely focused on examining the relationship between ESG and value creation. However, the results are inconclusive as some of the researchers note a positive association between ESG and value creation (Orlitzky et al., 2003; Harjoto & Jo, 2015; Frooman, 1997; Ferrell et al., 2016) while others report negative association (Friedman, 2007; Groening & Kanuri, 2013; Di Giuli & Kostovetsky, 2014). The nature of the link between ESG and firm value is defined by diverse theories in ESG literature.

Existing studies have utilized agency theory to elucidate the negative relationship between ESG and firm value (Buchanan et al., 2018). The conflict of interest between the agent and principal motivates managers to maximize their wealth at shareholders' expense, originating agency problems and rising agency costs in the firm (Jensen & Meckling, 1976). The negative perspective on ESG — the firm value link is based on the argument that ESG activities could lead to agency problems (Benabou & Tirole, 2010) and conclude that the relationship is negative (Groening & Kanuri, 2013). According to this argument, management takes part in ESG actions for their benefit (Benabou & Tirole, 2010) to improve their reputation (Barnea & Rubin, 2010) and forgo other profitable opportunities at the cost of shareholders' interest. The ESG investment causes an inefficient allocation of resources to other productive projects (Friedman, 2007), thus, failing to maximise firm performance in the long run.

Extant studies on the positive link between ESG and firm value have primarily relied on stakeholder theory (Li et al., 2018). Stakeholder theory suggests that the organization's activities and objectives impact the interests of owners, employees, managers, customers, suppliers, creditors, regulators, environmentalists, the community, and other groups (Orlitzky et al., 2003; Jensen, 2002). According to the extant literature, stakeholder (employees, customers, suppliers, and the community at large) relations and firm performance have a significant relationship. Choi and Wang (2009) in their study concluded that good stakeholder relations result in superior firm performance. In addition, good stakeholder relations help poorly performing firms overcome adverse financial conditions as well as sustain their competitive advantage. These findings reinforce the stakeholder theory suggesting that responsible and sustainable practices can help develop resilience and increase the firm value. Companies enhance stakeholder relations through ESG activities and as a result, improve their financial performance (Orlitzky et al., 2003). Based on stakeholder theory, this paper proposes a positive relationship between ESG score and firm value.

Some of the existing studies argue that one of the reasons for the inconsistent linkage between ESG and firm value is due to unobserved channels through which ESG impacts firm value (Servaes & Tamayo, 2013).

The moderation effect of OC on the ESG-firm value link can be explained by the expropriation hypothesis. The expropriation hypothesis states that large shareholders and stockholders may influence the decisions of managers (La Porta et al., 1999) to maximize their profits at the cost of the minority shareholders (Claessens et al., 2002), resulting in agency problems and raising agency costs for the company (Shleifer & Vishny, 1997). Research on the relationship between OC and CSR reports that high OC results in poorer CSR policies. Dam and Scholtens (2013) conclude that large controlling shareholders are less likely to prefer social initiatives by firms as it does not fulfil their interests. Bartkus et al. (2002) and Atkinson and Galaskiewicz (1988) reported a negative relationship between OC and corporate philanthropy. Higher OC also results in lower voluntary environmental disclosures (Brammer & Pavelin, 2006), increasing information asymmetry and reducing the firm value.

Few studies have explored the moderating role of OC on ESG-firm value links using samples from specific countries. Peng and Yang (2014) demonstrated the moderating role of OC on the association between corporate social

performance and firm performance using data for Taiwanese listed companies. Their results suggest that divergence between control rights and cash flow rights of controlling owners has a negative moderation effect on the association between social performance and firm performance. Akben-Selcuk (2019) studied the moderation effect of OC on the CSR-firm performance link using a sample of firms from Turkey. Their findings indicate that OC negatively moderates the CSR-firm performance association.

Albitar et al. (2020) examined the moderating effect of OC, gender diversity and board size on the link between Bloomberg ESG disclosure and firm performance using a sample of FTSE 350 Index companies. The authors find that OC, gender diversity and board size positively moderate the ESG-firm performance association. In a recent study, Wu et al. (2022) investigated the moderation impact of ownership structure on the association between ESG and firm value using a sample of Chinese manufacturing firms. Their results prove that the moderating impact of executive ownership and institutional ownership is significant; however, OC does not moderate the relation between ESG and firm value.

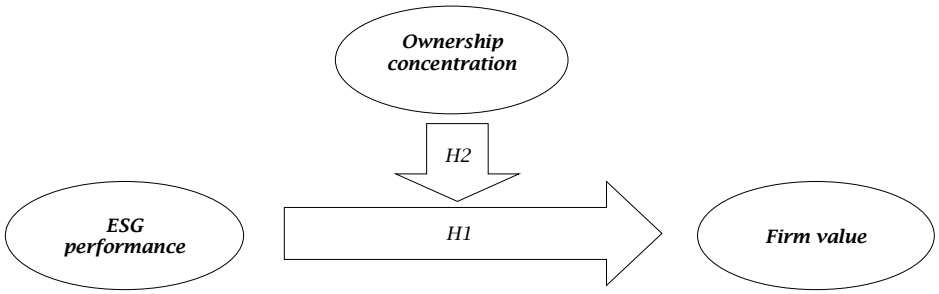
Based on the expropriation hypothesis, this study proposes that OC has a moderating rol in the ESG-firm value relationship because concentrated ownership can affect the transparency and disclosure levels, directly affecting the decision-making related to ESG investment, thus negatively impacting the firm value. This study elucidates the existing literature on ESG by exploring the role of OC as a moderator using a sample of global firms. Therefore, this paper proposes the following hypotheses:

H1: There is a positive and significant relationship between ESG performance and firm value.

H2: Ownership concentration (OC) has a negative moderation effect on the relationship between ESG score and firm value.

Figure 1 shows OC within a conceptual framework representing its moderation effect.

Figure 1. Relationship among ownership concentration, ESG performance, and firm value



3. RESEARCH METHODOLOGY

To analyse how OC moderates the link between ESG and firm value among global firms, accounting data and ESG-related scores have been collected from Refinitiv Eikon. There are 15,640 firm-year observations across 1,564 international firms in this sample between 2011 and 2020. Those firms are included in the sample which has balanced panel data for all variables employed in this study. The sample includes firms across 46 developed and emerging countries and 11 GICS stock market sectors (The Global Industry Classification Standard) (Tables A.1 and A.2 in Appendix A).

In this study, *Firm value* is the dependent variable. *Tobin's Q* (*TQ*) has been used as the proxy for firm value in this study, which is widely used by various researchers (Servaes & Tamayo, 2013; Ferrell et al., 2016; Aouadi & Marsat, 2018). *TQ* is calculated as follows:

$$Tobin'sQ = \frac{(Book\ Value\ of\ Assets - Book\ Value\ of\ Equity - Deferred\ Taxes + Market\ Value\ of\ Equity)}{(Book\ Value\ of\ Assets)} \quad (1)$$

The primary independent variable is the *Refinitiv ESG score*. Based on the information provided by companies in their annual reports, on their websites, through stock exchange filings, and in their CSR reports, Refinitiv Eikon[1] provides *ESG scores* to measure the ESG performance of a firm (Refinitiv, 2022). It produces a score between 0–100, where a higher score indicates better ESG performance. Previous studies have used the Refinitiv Eikon *ESG score* as a proxy for ESG performance (Demers et al., 2021; Shakil et al., 2021; Gigante & Manglaviti, 2022; Apergis et al., 2022). Thus, these scores are employed to examine the hypotheses.

OC is the moderating variable in this study. Previous studies have used the ownership percentage of the single largest shareholder as a measure of *OC* since the single largest shareholder can single-handedly dominate corporate policies and may involve expropriation activities (Guedhami & Pittman, 2008). Previous studies have also used Hirschman–Herfindahl Index (*HHI*) to proxy for *OC*. Jiang et al. (2011) construct *HHI* using the top five shareholdings including ownership by financial institutions, inside shareholders, and other outside large shareholders. Dam and Scholtens (2013) use all shareholdings to construct *HHI*. In this study, *OC* is

[1] Refinitiv Eikon provides ESG scores designed to quantify the relative ESG performance of a firm. The database covers ten main themes: 1) resource use, 2) emissions, 3) environmental product innovation, 4) workforce, 5) human rights, 6) community, 7) product responsibility, 8) management, 9) shareholders and 10) corporate social responsibility strategy. These ten themes are expressed in the three pillar scores (environmental, social, and governance) and the final ESG score, reflecting how well a company is doing in its ESG performance (Refinitiv, 2022).

measured using a *single controlling shareholder* (*SCS*) and *HHI*. Hirschman–Herfindahl Index is constructed in the same way as constructed in (Jiang et al., 2011) and is computed as the sum of squared shareholdings of the five largest shareholders:

$$HHI_{i,t} = \Sigma_{i=1}^{n} s_i^2 \quad (2)$$

where $s_i = i = 1, \ldots, 5$) is the shareholding percentage of the five largest shareholders. *HHI* ranges from 0 to 1, and higher *HHI* reflects more concentrated ownership in a firm (Jiang et al., 2011; Dam & Scholtens, 2013).

Following Li et al. (2018) and Aouadi and Marsat (2018), the firm characteristics reported to influence firm value are used as control variables. *CASH* is calculated by dividing total cash by total assets, *LEVERAGE* is calculated by dividing total debt by total assets, and *FIRM SIZE* is calculated as the natural log of total assets.

The *H1* proposes that ESG-related scores (*ESG, E, S,* and *G*) positively affect firm value. Following regression models are developed to evaluate the link between firm value, ESG-related scores, and control variables:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 CASH_{i,t} + \beta_3 LEVERAGE_{i,t} + \beta_4 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (3)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 CASH_{i,t} + \beta_3 LEVERAGE_{i,t} + \beta_4 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (3.1)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 CASH_{i,t} + \beta_3 LEVERAGE_{i,t} + \beta_4 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (3.2)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_2 CASH_{i,t} + \beta_3 LEVERAGE_{i,t} + \beta_4 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (3.3)$$

In *H2* the paper proposes that *OC* has a moderating effect on the link between *ESG score* and *firm value*. *OC* and an interaction term are included in the primary model to evaluate this moderating effect:

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 OC_{i,t} + \beta_3 ESG_{i,t} * OC_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LEVERAGE_{i,t} + \beta_6 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (4)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 OC_{i,t} + \beta_3 E_{i,t} * OC_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LEVERAGE_{i,t} + \beta_6 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (4.1)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 OC_{i,t} + \beta_3 S_{i,t} * OC_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LEVERAGE_{i,t} + \beta_6 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (4.2)$$

$$Tobin's\ Q_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_2 OC_{i,t} + \beta_3 G_{i,t} * OC_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LEVERAGE_{i,t} + \beta_6 FIRM\ SIZE_{i,t} + IndustryFixedEffect_i + YearFixedEffect_t + CountryFixedEffect_c + \varepsilon_{i,t} \quad (4.3)$$

4. RESULTS

Descriptive statistics are presented in Table B.1 (see Appendix B). All variables were winsorized at the 1% and 99% levels to control the impact of outliers following (Li et al., 2018; Demers et al., 2021). The mean *ESG score* is 54.745. Further, the minimum value is 7.173 and the maximum value is 90.216. *TQ* has a mean of 1.782. The minimum value is 0.675, and the maximum value is 6.954. The multivariate test is not likely to be affected by multicollinearity because none of the explanatory variables exceeded the value of 10 for the variance inflation factor (VIF).

Based on estimating Eq. (3), Model 1 of Tables B.3–B.6 (in Appendix B) presents the results. The results of Eq. (3) are displayed in Model 1 of Table B.3 based on the *ESG score* as the main explanatory variable. The coefficient of the *ESG score* is positive, i.e., 0.003 and is significant at the 1% level. These results corroborate the prediction that higher *ESG scores* enhance firm value. Regarding the other control variables, the signs of their coefficients are generally in accordance with those found in the previous studies. *CASH* is positively related to *TQ*, consistent with Martínez-Sola et al. (2013); similarly, *FIRM SIZE* is negatively correlated with *TQ*, consistent with Aouadi and Marsat (2018).

The independent variables of interest are changed to an *environmental (E) score*, *social (S) score*, and *governance (G) score* to demonstrate that any single component does not influence the results. When using *E score* as the test variable in Model 1 of Table B.4, the *E* coefficient is positive and significant, suggesting that any single component is not driving the results. Model 1 in Tables B.5 and B.6 summarise the results when *S* and *G scores* are used as test variables. *S* and *G* coefficients are positive and significant, following the findings in Model 1 of Tables B.3 and B.4.

Based on estimating Eq. (4), Models 3 and 5 of Tables B.3–B.6 present the results. In Tables B.3–B.6, *SCS* and *HHI* are used to proxy *OC* in Model 3 and Model 5, respectively. Table B.3 (Models 3 and 5) investigates the role of *OC* on the link between *ESG score* and *firm value*. The interaction term (*ESG * OC*) tests the moderation hypothesis, which is the crucial variable. Based on the negative coefficient of *ESG * OC* (β_3 = -0.01 in the Model 3 and β_3 = -0.013 in the Model 5), the average increase in *firm value* due to *ESG* is

lower for firms with a high concentration of ownership when other factors are controlled. Hence, *H2* is supported by the finding that the interaction between *ESG* and *OC* negatively impacts firm value.

The moderation effects of *OC* on the association between the *E score* and firm value, the *S score* and firm value, and the *G score* and firm value are also examined (Models 3 and 5 of Tables B.4–B.6). The interaction terms *E * OC, S * OC* and *G * OC* have negative coefficients, which are significant at 1%, respectively. In support of *H2*, the interaction between *ESG-related scores* and *OC* negatively impacts *firm value*. This finding suggests that the average increase in firm value due to the *E score*, *S score* and *G score* is lower for firms with high *OC* when other factors are controlled.

Previous studies suggest that reverse causality exists between *ESG scores* and *firm performance* (Li et al., 2018; El Ghoul et al., 2011). This causality suggests that better firm performance leads to higher *ESG scores* since firms with better valuations or performance can afford or have the capacity to commit to more investment in ESG-related activities. Two-stage least squares (2SLS) estimation procedure is implemented to determine whether the reverse causality drives the main results. This section discusses the results presented in Models 2, 4 and 6 of Tables B.3–B.6 These results support hypotheses *H1* and *H2*, which are related to a positive relationship between *ESG performance* and *firm value*, and the negative moderation effect of *OC* on the relationship between *ESG score* and *firm value*, respectively.

The industry-year average value of the *ESG score* is used as an instrumental variable in this study, following El Ghoul et al. (2011). The instrument is probably exogenous to current *ESG scores*. The instrumental variable significantly affects the *ESG score* according to the first-stage regression results. 2SLS results are presented in Model 2, Table B.3. These results support the main hypothesis that ESG is significantly related to firm value; thus, the main results are not affected by endogeneity bias. Robustness tests are conducted for all models, in the same way, using 2SLS (the results are presented in Models 2, 4, and 6 of Tables B.3–B.6). These results support the two main hypotheses.

5. DISCUSSION

The findings of this study corroborate the proposed hypotheses. The impact of *E, S*, and *G scores* have been examined separately from the comprehensive *ESG score* to ensure that any specific dimension does not drive these results because previous researchers (Duuren et al., 2016) found that investors may weigh these dimensions differently. The results of *E, S* and *G scores* corroborate the main findings. Furthermore, we perform an instrumental variables estimate to investigate whether these results are affected by endogeneity bias.

The results of this study illustrate that ESG scores have a significant positive impact on firm value. One reason might be that companies adopting sustainability practices have more efficient organizational processes and long-term orientation (Eccles et al., 2014), have lower cost of capital, and promote shareholder welfare which leads to enhanced firm value (Fatemi et al., 2018). These results are in line with the findings of previous studies which found that ESG is positively related to firm value (Ferrell et al., 2016; Wong et al., 2021). Conversely, there are studies which found that ESG is negatively related to firm performance (Di Giuli & Kostovetsky, 2014).

Further results of this study show that OC negatively moderates the relationship between ESG and firm value. This result supports the expropriation hypothesis. Large shareholders acquire information and influence decisions related to ESG actions which may result in information asymmetry impacting decision-making on ESG practices and disclosures (Akben-Selcuk, 2019). This could negatively affect firm value. This finding is also consistent with previous studies (Peng & Yang, 2014; Akben-Selcuk, 2019). Contrary to the findings of this study, Albitar et al. (2020) illustrated that OC has a positive moderating role on the ESG disclosure-firm performance relation and Wu et al. (2022) demonstrated that OC has no significant moderation effect on the ESG-firm link.

6. CONCLUSION

The top-down push on sustainability from the United Nations and regulators encourages firms to adopt responsible and sustainable practices. The move towards sustainability has resulted in growing recognition of accounting and reporting of firm performance using the triple bottom-line framework prioritizing impact on people and the planet equally to the firm's profitability. This has resulted in voluntary and mandatory disclosures on ESG performance. The three sub-indicators of the ESG index measure the firm's practices towards a sustainable environment, stakeholder relations, and corporate governance quality. The objective of this study is to investigate how ESG scores impact firm value in the presence of OC. The sample consists of 15,640 firm-year observations across 46 developed and emerging countries from 2011 to 2020. The results show that ESG positively affects firm value, and the interaction between ESG and OC has a negative impact. Different ESG-related scores are used, and the results are significant and consistent for all measures. The results are consistent for two different measures of OC and hold for 2SLS estimates to address the endogeneity issue between ESG score and firm value.

Based on these findings, it can be concluded that higher ESG scores enhance firm value. Higher ESG firms exhibit increased firm value than lower ESG firms. These results corroborate the previous findings and support the stakeholder theory. The investors and other major stakeholders are drawn to firms with better ESG, and this enhanced relationship will benefit firms in the long run through increased firm value. The positive association between ESG and firm value entails that firms should lay emphasis on ESG actions, even though the costs are related to such activities.

This study illuminates the mixed results of previous works on ESG-firm value association by taking into account the moderation effect of OC. Further results suggest that OC negatively moderates the relationship between ESG and firm value, supporting the entrenchment effect.

The expropriation hypothesis indicates that controlling shareholders' incentive to gain information for controlling corporate policies might cause information asymmetry that affects ESG decisions. ESG policies are likely to be affected by controlling owners for firms with concentrated ownership, which would ultimately adversely impact the firm value. Considering these findings, effective control mechanisms are necessary to protect minority shareholders' rights in firms with high OC because they can be prone to overinvesting in ESG activities and thus worsening financial performance. Furthermore, the results are essential for regulators and policymakers in assessing how ESG, with concentrated ownership structures, influence firm value. Regulators could examine the usefulness of ESG practices in firms with high OC since ESG could worsen financial performance in such firms due to the expropriation incentives. Governance policymakers will benefit from the results because it provides new insights into the critical role played by concentrated ownership. It is reasonable to infer that OC affects ESG performance and reporting.

The limitations of this current study have been discussed in this section. We have considered OC a negative moderator of the association between ESG and firm value. It is possible, however, that other factors, such as governance structures, play a role in this relationship, but these are not discussed in this study. Further studies can explore the role of these moderators. We analysed data from large global listed companies. Future research could address these limitations by investigating the relationship between private firms, small and medium-sized firms, and country-specific firms to generalise these findings. Additionally, future studies can examine OC and other governance mechanisms to determine how ESG interacts with firm value at the industry level.

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APPENDIX A

Table A.1. Industry-wise distribution of firms

GICS Sector	*Number of firms*	*% of firms*
Communication services	106	6.78%
Consumer discretionary	193	12.34%
Consumer staples	151	9.65%
Energy	92	5.88%
Financials	80	5.12%
Health care	122	7.80%
Industrials	273	17.46%
Information technology	169	10.81%
Materials	184	11.76%
Real estate	85	5.43%
Utilities	109	6.97%
Total	**1564**	**100.00%**

Table A.2. Country-wise distribution of firms

Country	*Number of firms*	*% of firms*
Australia	47	3.01%
Austria	3	0.19%
Belgium	9	0.58%
Brazil	29	1.85%
Canada	65	4.16%
Chile	8	0.51%
China	36	2.30%
Colombia	2	0.13%
Czech Republic	1	0.06%
Denmark	14	0.90%
Finland	10	0.64%
France	54	3.45%
Germany	36	2.30%
Greece	3	0.19%
Hong Kong	113	7.23%
Hungary	2	0.13%
India	53	3.39%
Indonesia	14	0.90%
Ireland	5	0.32%
Israel	3	0.19%
Italy	12	0.77%
Japan	213	13.62%
Kuwait	1	0.06%
Malaysia	17	1.09%
Mexico	15	0.96%
Netherlands	14	0.90%
New Zealand	4	0.26%
Norway	7	0.45%
Philippines	12	0.77%
Poland	6	0.38%
Portugal	4	0.26%
Qatar	1	0.06%
Russia	13	0.83%
Saudi Arabia	5	0.32%
Singapore	14	0.90%
South Africa	24	1.53%
South Korea	63	4.03%
Spain	13	0.83%
Sweden	27	1.73%
Switzerland	31	1.98%
Taiwan	54	3.45%
Thailand	16	1.02%
Turkey	7	0.45%
United Arab Emirates	1	0.06%
United Kingdom	72	4.60%
United States of America	411	26.28%
Total	**1564**	**100.00%**

APPENDIX B

Table B.1. Descriptive statistics

Variables	*Observations*	*Mean*	*Std. dev.*	*Minimum*	*Maximum*
TQ	15640	1.782	1.112	0.675	6.954
ESG	15640	54.745	20.679	7.173	90.216
E score	15640	51.881	27.846	0.000	95.732
S score	15640	55.149	24.538	2.733	95.700
G score	15640	56.137	21.844	7.604	94.331
SCS	15640	0.209	0.196	0.025	0.803
HHI	15640	0.094	0.138	0.002	0.649
CASH	15640	0.130	0.119	0.002	0.569
LEVERAGE	15640	0.267	0.169	0.000	0.760
FIRM SIZE	15640	23.294	1.269	20.440	26.534

Note: Table B.1 provides summary statistics for all variables. TQ represents Tobin's Q; E, S, and G represent environmental, social and governance scores respectively; SCS represents single controlling shareholding; and HHI is Herfindahl-Hirschman Index.

Table B.2. Pearson correlation

	TQ	*ESG*	*E score*	*S score*	*G score*	*SCS*	*HHI*	*CASH*	*LEVERAGE*	*FIRM SIZE*
TQ	1.000	-	-	-	-	-	-	-	-	-
ESG	-0.040***	1.000	-	-	-	-	-		-	-
E score	-0.141***	0.864***	1.000	-	-	-	-	-	-	-
S score	0.023***	0.907***	0.735***	1.000	-	-	-	-	-	-
G score	-0.023***	0.672***	0.395***	0.423***	1.000	-	-	-	-	-
SCS	-0.011	-0.135***	-0.071***	-0.094***	-0.180***	1.000	-	-	--	-
HHI	0.001	-0.130***	-0.069***	-0.095***	-0.164***	0.970***	1.000	-	-	-
CASH	0.315***	-0.123***	-0.139***	-0.117***	-0.070***	0.014*	0.016**	1.000	-	-
LEVERAGE	-0.163***	0.055***	0.052***	0.048***	0.055***	-0.043***	-0.050***	-0.375***	1.000	-
FIRM SIZE	-0.428***	0.395***	0.427***	0.339***	0.221***	-0.056***	-0.037***	-0.259***	0.246***	1.000

*Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*

Table B.3. The impact of *ESG scores* on *firm value* and the moderating effect of *OC* (*SCS* and *HHI*) on that association.

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
	OLS	*2SLS*	*OLS*	*2SLS*	*OLS*	*2SLS*
			OC = SCS	*OC = SCS*	*OC = HHI*	*OC = HHI*
ESG	0.003***	0.011***	0.005***	0.017***	0.004***	0.014***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
OC			0.353*	1.392***	0.536**	1.536***
			(0.205)	(0.186)	(0.269)	(0.205)
*ESG * OC*			-0.010***	-0.030***	-0.013***	-0.031***
			(0.003)	(0.003)	(0.004)	(0.004)
CASH	0.316*	0.429***	0.314*	0.403***	0.316*	0.391***
	(0.168)	(0.071)	(0.167)	(0.071)	(0.167)	(0.071)
LEVERAGE	0.192	0.178***	0.184	0.159***	0.184	0.165***
	(0.131)	(0.052)	(0.130)	(0.052)	(0.130)	(0.052)
FIRM SIZE	-0.371***	-0.418***	-0.373***	-0.420***	-0.372***	-0.421***
	(0.027)	(0.013)	(0.027)	(0.013)	(0.027)	(0.013)
Constant	10.149***	10.861***	10.098***	10.585***	10.117***	10.750***
	(0.638)	(0.290)	(0.639)	(0.283)	(0.638)	(0.290)
Observations	15640	15640	15640	15640	15640	15640
Adjusted R^2	38.21%	38.24%	37.84%	36.67%	37.89%	37.03%
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes

*Note: Table B.3 displays the regression results where Tobin's Q is the dependent variable and ESG score is the independent variable (Model 1). Model 2 examines the robustness of the main results shown in Model 1. Models 3 and 5 display the moderation effect of OC (measured by single controlling shareholder (SCS) in Model 3 and Hirschman Herfindahl Index (HHI) in Model 5). Models 4 and 6 check the robustness of the main inferences in Models 3 and 5. In parentheses, robust standard errors clustered at the firm level are presented. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*

Table B.4. The impact of environmental performance (*E*) on *firm value* and the moderating effect of *OC* (*SCS* and *HHI*) on that association

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
	OLS	*2SLS*	*OLS*	*2SLS*	*OLS*	*2SLS*
			OC = SCS	*OC = SCS*	*OC = HHI*	*OC = HHI*
E score	0.001***	0.006***	0.003***	0.008***	0.003***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
OC			0.218	0.651***	0.396*	0.837***
			(0.173)	(0.139)	(0.229)	(0.159)
*E score * OC*			-0.008***	-0.018***	-0.011***	-0.020***
			(0.002)	(0.003)	(0.003)	(0.003)
CASH	0.314*	0.312***	0.309*	0.318***	0.310*	0.311***
	(0.168)	(0.071)	(0.167)	(0.071)	(0.167)	(0.071)
LEVERAGE	0.192	0.203***	0.182	0.174***	0.180	0.177***
	(0.132)	(0.052)	(0.131)	(0.052)	(0.131)	(0.052)
FIRM SIZE	-0.365***	-0.402***	-0.368***	-0.397***	-0.367***	-0.398***
	(0.027)	(0.014)	(0.027)	(0.014)	(0.027)	(0.014)
Constant	10.116***	10.830***	10.109***	10.566***	10.110***	10.657***
	(0.649)	(0.330)	(0.648)	(0.312)	(0.648)	(0.320)
Observations	15640	15640	15640	15640	15640	15640
Adjusted R^2	37.82%	37.40%	37.50%	36.69%	37.54%	36.85%
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes

*Note: Table B.4 displays the regression results where Tobin's Q is the dependent variable and E score is the independent variable (Model 1). Model 2 examines the robustness of the main results shown in Model 1. Models 3 and 5 display the moderation effect of OC (measured by single controlling shareholder (SCS) in Model 3 and Hirschman Herfindahl Index (HHI) in Model 5). Models 4 and 6 check the robustness of the main inferences in Models 3 and 5. In parentheses, robust standard errors clustered at the firm level are presented. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*

Table B.5. The impact of social performance (*S*) on *firm value* (*Tobin's Q*) and the moderating effect of *OC* (*SCS* and *HHI*) on that association

Variables	*Model 1*	*Model 2*	*Model 3*	*Model 4*	*Model 5*	*Model 6*
	OLS	*2SLS*	*OLS*	*2SLS*	*OLS*	*2SLS*
			OC = SCS	*OC = SCS*	*OC = HHI*	*OC = HHI*
S score	0.002***	0.011***	0.004***	0.020***	0.003***	0.016***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
OC			0.200	1.702***	0.347	1.717***
			(0.189)	(0.162)	(0.250)	(0.179)
*S score * OC*			-0.007**	-0.036***	-0.009**	-0.035***
			(0.003)	(0.003)	(0.004)	(0.003)
CASH	0.321*	0.556***	0.315*	0.433***	0.318*	0.443***
	(0.168)	(0.072)	(0.167)	(0.073)	(0.167)	(0.073)
LEVERAGE	0.202	0.202***	0.197	0.206***	0.196	0.209***
	(0.131)	(0.052)	(0.131)	(0.053)	(0.131)	(0.053)
FIRM SIZE	-0.367***	-0.425***	-0.369***	-0.437***	-0.368***	-0.436***
	(0.026)	(0.012)	(0.026)	(0.013)	(0.026)	(0.013)
Constant	10.099***	10.982***	10.069***	10.767***	10.075***	10.971***
	(0.634)	(0.271)	(0.638)	(0.280)	(0.636)	(0.282)
Observations	15640	15640	15640	15640	15640	15640
Adjusted R^2	38.23%	38.08%	37.94%	34.67%	37.98%	35.68%
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes

*Note: Table B.5 displays the regression results where Tobin's Q is the dependent variable and S score is the independent variable (Model 1). Model 2 examines the robustness of the main results shown in Model 1. Models 3 and 5 display the moderation effect of OC (measured by single controlling shareholder (SCS) in Model 3 and Hirschman Herfindahl Index (HHI) in Model 5). Models 4 and 6 check the robustness of the main inferences in Models 3 and 5. In parentheses, robust standard errors clustered at the firm level are presented. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*

Table B.6. The impact of governance performance (*G*) on *firm value* (*Tobin's Q*) and the moderating effect of *OC* (*SCS* and *HHI*) on that association

Variables	***Model 1***	***Model 2***	***Model 3***	***Model 4***	***Model 5***	***Model 6***
	OLS	*2SLS*	*OLS*	*2SLS*	*OLS*	*2SLS*
			OC = SCS	*OC = SCS*	*OC = HHI*	*OC = HHI*
G score	0.001***	0.004***	0.002***	0.007***	0.001***	0.005***
	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
OC			0.023	0.754**	0.081	0.740**
			(0.172)	(0.330)	(0.222)	(0.309)
*G score * OC*			-0.003***	-0.017***	-0.003***	-0.016***
			(0.002)	(0.006)	(0.003)	(0.006)
CASH	0.321*	0.328***	0.322*	0.344***	0.324*	0.338***
	(0.168)	(0.071)	(0.168)	(0.071)	(0.168)	(0.071)
LEVERAGE	0.179	0.158***	0.178	0.153***	0.178	0.154***
	(0.130)	(0.052)	(0.130)	(0.053)	(0.130)	(0.053)
FIRM SIZE	-0.356***	-0.365***	-0.357***	-0.369***	-0.356***	-0.367***
	(0.026)	(0.012)	(0.026)	(0.012)	(0.026)	(0.012)
Constant	9.885***	9.923***	9.901***	9.829***	9.886***	9.887***
	(0.629)	(0.286)	(0.627)	(0.287)	(0.626)	(0.285)
Observations	15640	15640	15640	15640	15640	15640
Adjusted R^2	37.85%	37.91%	37.65%	37.13%	37.74%	37.45%
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes

*Note: Table B.6 displays the regression results where Tobin's Q is the dependent variable and governance score (G) is the independent variable (Model 1). Model 2 examines the robustness of the main results shown in Model 1. Models 3 and 5 display the moderation effect of OC (measured by single controlling shareholder (SCS) in Model 3 and Hirschman Herfindahl Index (HHI) in Model 5). Models 4 and 6 check the robustness of the main inferences in Models 3 and 5. In parentheses, robust standard errors clustered at the firm level are presented. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.*