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Reexamining Ownership Structure, ESG Engagements, and Corporate Financial Performance: The Nonlinear Relationship in Japan[*]

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Abstract

This study examines the nonlinear effects of ownership structures on environmental, social, and governance (ESG) performance in Japan and investigates the nonlinear relationship between ESG and corporate financial performance. The results suggest an inverted U-shaped relationship between foreign ownership and ESG performance and a U-shaped relationship between managerial ownership and ESG performance. However, the effect of institutional ownership on ESG is positive and linear. The results of the ESG pillars indicate that the above foreign ownership-ESG link is significant only in the social and environmental pillars, while the above managerial ownership-ESG link is significant in the social, governance, and environmental pillars. Further evidence indicates that ESG links to corporate financial performance through an inverted U-shaped pattern, and such relationships mainly result from the social pillar and governance pillar when the dependent variables are firm values (e.g., Tobin's Q) and profitability (e.g., operating income on assets and return on equity), respectively. These findings contribute to the understanding of the relationships between ownership structures and firms' ESG performance as well as the effects of ESG on financial performance in the Japanese capital market.

JEL Classification: M41

Keywords: ESG performance; Ownership structure; Corporate financial performance; Nonlinear relationship

1. Introduction

With the emerging concerns about how to achieve sustainable development goals (SDGs), firms are increasingly expected to undertake environmental, social, and governance (ESG) activities and

consider social interests.[1] For several decades, numerous economic and non-economic determinants of corporate social responsibility (CSR) have been examined in research (Oh et al., 2011). For instance, available empirical evidence (e.g., Harjoto and Jo, 2011; Khan et al., 2013) documents the effects of corporate governance mechanisms on firms' CSR choices and emphasizes the role of ownership structure. However, the results of the relationships between major shareholders' ownership and socially responsible performance have been mixed.[2] Moreover, despite abundant studies on the costs and benefits of firms' socially responsible behaviors, there is no consensus on the nature of the relationship between ESG and corporate financial performance (CFP).[3] Given the inconsistent empirical evidence in the previous literature and the scant research in non-Western contexts, this study plans to reexamine the research framework regarding the determinants and consequences of ESG in the Japanese setting.

The purpose of this study is to reconcile the above inconsistency by providing evidence of the nonlinear relationship between ownership structure and ESG as well as the nonlinear relationship between ESG and CFP. I focus on the Japanese stock market because its unique institutional environment provides a good opportunity to do so. Specifically, the Japanese ownership structure features the dominance of stable shareholdings arrangements made through cross-owned networks (Douthett and Jung, 2001; Shuto and Kitagawa, 2011), where value-relevant information is shared exclusively within the grouping (Sheard, 1991). This environment may influence information asymmetry among different types of owners (e.g., institutional ownership, managerial ownership, and foreign ownership) (Suto and Takehara, 2018), and the level of information transparency (including both financial and non-financial information) is regarded as an important factor affecting their decisions (Jiang and Kim, 2004). Owing to insufficient disclosure practices in the Japanese market (Suto and Takehara, 2018), such a feature may further impact firms' non-financial (ESG) strategies. Thus, the relationship between the ownership of different shareholders and ESG performance might be more effectively captured in Japan than in other countries.

First, I hypothesize that the ownership structure affects ESG performance through a nonlinear pattern. Specifically, I propose the following hypotheses: (1) there is an inverted U-shaped relationship between institutional ownership and ESG performance; (2) there is an inverted U-shaped relationship

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[1] KPMG's (2020) survey shows that approximately 80% of the top 100 companies across 52 countries report their sustainability activities publicly, an increase from just over 50% in 2008. In particular, 100% of the top companies in Japan report on sustainability.

[2] For example, some studies find that managerial ownership has a positive effect on corporate social performance (e.g., Johnson and Greening, 1999), while others document a negative relationship between managerial ownership and CSR performance or disclosure (e.g., Ghazali, 2007; Barnea and Rubin, 2010; Oh et al., 2011; Khan et al., 2013). Similarly, some studies suggest a positive effect of institutional ownership on CSR (e.g., Oh et al., 2011), while others find a negative effect (e.g., Arora and Dharwadkar, 2011; García-Meca and Pucheta-Martínez, 2018) or no significant effects (e.g., Barnea and Rubin, 2010).

[3] Specifically, some studies find a positive effect of CSR on CFP (e.g., Ruf et al., 2001; Gregory et al., 2014), while others find a negative effect (e.g., Hillman and Keim, 2001; Brammer et al., 2006) or no significant effects (Teoh et al., 1999).

between foreign ownership and ESG performance; and (3) there is a U-shaped relationship between managerial ownership and ESG performance. Furthermore, I hypothesize that (4) increased ESG performance displays an inverted U-shaped relationship with corporate financial performance.

To examine the above hypotheses, I follow Oh et al. (2017) and Meier et al. (2021) to use the quadratic equation in ordinary least square (OLS) regression with robust standard errors to correct for heteroskedasticity. Using 4,337 firm-year observations from 2002 to 2017 for Hypothesis 1 and 4,003 firm-year observations from 2002 to 2017 for Hypothesis 2,[4] I find that foreign ownership has an inverted U-shaped effect on ESG, while managerial ownership has a U-shaped effect on ESG. This suggests that ESG performance improves as foreign ownership increases but decreases once the level of foreign ownership reaches a critical mass. In contrast, managers with low or high levels of shares have strong incentives to invest in ESG, while they tend to reduce social engagements at intermediate levels of ownership. However, the relationship between institutional ownership and ESG is shown to be a positive linear pattern. Further results indicate that ESG has an inverted U-shaped effect on corporate financial performance, showing that there is an optimal social performance for a firm's financial performance.

This study contributes to the ESG literature in several ways. First, it challenges the traditional linear models and aims to reconcile the inconsistency of previous findings by investigating the nonlinear models. Given the scant literature that has proposed a nonlinear relationship between ownership structure and ESG (e.g., Oh et al., 2017) and a nonlinear relationship between ESG and CFP (e.g., Fuji et al., 2013; Sun et al., 2019; Meier et al., 2021), this study enriches the literature by exploring the nature of ownership structure-ESG relationship as well as the ESG-CFP link. Second, this study extends previous research by examining the determinants and consequences of ESG in a Japanese setting. As most previous studies use U.S. or European samples and there is a lack of research focusing on Asian contexts (Chang et al., 2017), this study enriches the previous studies by providing supplementary evidence from Japan. Finally, the findings of this study may have important policy implications for different shareholders and managers.

The remainder of this paper is organized as follows. Section 2 provides a literature review and develops the hypotheses. Section 3 presents the research design of the study. Section 4 presents the empirical results and robustness checks. Finally, Section 5 concludes the study.

2. Literature Review and Hypothesis Development
2.1 Literature Review
Ownership Structure and ESG Performance
It has been documented that ownership structures can influence organizational behaviors such as social

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[4]   The final sample sizes of four measures of corporate financial performance are different. Please see Panel B of Table 1.

and environmental activities (Arora and Dharwadkar 2011; Oh et al., 2017). Moreover, different types of owners have divergent orientations and preferences regarding corporate decisions and investments, and thus have different effects on socially responsible investments (Oh et al., 2011).[5] Specifically, Johnson and Greening (1999) find that top management equity is positively related to corporate social performance (CSP) in the product quality dimension. Ghazali (2007) finds that director ownership has a negative influence on CSR disclosure in Malaysian firms' annual reports. Barnea and Rubin (2010) show that insider ownership is negatively related to a firm's social rating, while institutional ownership is uncorrelated with it. Oh et al. (2011) use Korean samples and show a significant positive relationship between CSR ratings and ownership by institutions and foreign investors. By contrast, there is a negative relationship between shareholding by top managers and CSR ratings. Khan et al. (2013) further indicate a negative association between managerial ownership and the level of CSR disclosures and a positive association between foreign ownership and CSR disclosures in Bangladeshi companies.

Given the inconclusive evidence provided by the prior research, Oh et al. (2017) argue that the mechanisms through which ownership affects socially responsible strategies are complex, and the nonlinear model may help reconcile the existing empirical inconsistency. Their results suggest that the relationship between insider ownership and CSR is a U-shaped pattern and that the relationship between institutional ownership and CSR is an inverted U-shape. In general, there is limited literature on the nonlinear relationship between ownership structure and ESG performance.

ESG Engagements and Corporate Financial Performance

Whether it is worthwhile for organizations to pay attention to societal demands is a long-standing question. According to Friedman's (1970) shareholder theory, managers' only responsibility is to increase shareholders' wealth, and they have no right to spend money for purposes other than increasing profits (Nollet et al., 2016). Under the agency theory of Jensen and Meckling (1976), managers have incentives to invest in CSR to fulfil their own interests, and CSR itself is a potential agency cost. The benefits of CSR investment are obtained by insiders, but the risks and costs are paid by other shareholders (Barnea and Rubin, 2010). Therefore, this suggests that socially responsible investments will deteriorate corporate financial performance. In this regard, Boyle et al. (1997) investigate how investors perceive the effects of social responsibility information on firm value and find that the market reacts negatively to both the signers and non-signers of the defense industries initiative (DII). Hillman and Keim (2001) find that social issue participation is negatively associated with shareholder value. Brammer et al. (2006) examine the relationship between CSP and CFP measured using stock returns and find that firms with higher social performance scores tend to achieve lower returns. More recently, Buchanan et al. (2018) find that socially responsible firms are hit harder during the financial crisis, which supports the overinvestment hypothesis.

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[5]   Specifically, Oh et al. (2011) break down owners into three separate categories: institutional ownership, managerial ownership, and foreign ownership.

In contrast, Freeman's (1994) stakeholder theory argues that managers have a fiduciary responsibility to all stakeholders, not just shareholders. Thereby, socially responsible engagements can be regarded as "strategic CSR" which is consistent with the strategy of maximizing profit (Baron, 2001). Empirical evidence supports this argument. For instance, Ruf et al. (2001) show that change in corporate social performance is positively associated with sales growth for the current and subsequent year. Moreover, there is a positive relationship between return on sales and the change in corporate social performance for the third financial period. Schnietz and Epstein (2005) find that a firm's reputation gained from social responsibility activities could protect it from stock declines associated with a crisis. Servaes and Tamayo (2013) further show that CSR activities can enhance the value of firms with high public awareness. Gregory et al. (2014) find that firms with high CSR levels have a higher expected growth rate in their abnormal earnings.

However, some studies suggest that the above linear relationship between social performance and CFP can be problematic and propose that previous inconsistent findings can be explained by nonlinear models. Theoretically, Marom (2006) proposes a unified theory showing a tendency toward an inverted U-shaped relationship between CSR and CFP. Brammer and Millington (2008) argue that both U-shaped and inverted U-shaped relationships between CSR and CFP may exist, based on conceptual frameworks.[6] Empirically, Nollet et al. (2016) provide evidence of a U-shaped relationship between CSP and the accounting-based measures of CFP. Sun et al. (2019) find that an initial increase in CSR engagement could increase shareholder value, but the effect becomes negative at high CSR levels. Meier et al. (2021) demonstrate a significant quadratic (inverted U-shaped) relationship between human resource management (HRM)–CSP and CFP.

Ownership Structure, ESG Engagements, and Corporate Financial Performance in Japan

Prior studies suggest that the unique feature of ownership structure in Japan is that stable shareholding which comprises cross-shareholdings and financial institutions is a common practice in the Japanese equity market, involving implicit long-term contracts between firms and stable shareholders (Douthett and Jung, 2001; Shuto and Kitagawa, 2011; Shuto and Iwasaki, 2014; Kuang, 2022). This unique feature may influence the information asymmetry among different types of owners (Suto and Takehara, 2018), which may further impact firms' ESG strategies. For instance, Suto and Takehara (2018) emphasize the role of foreign investors in the Japanese capital market and find that foreign investors not only prefer high CSP firms but also enforce CSP among Japanese firms since the late 2000s. Endo (2020) finds that foreign blockholders significantly constrain environmental performance, while domestic blockholders do not have a significant effect on environmental performance.

Existing Japanese studies have also documented inconclusive findings regarding the relationship between ESG and CFP. Specifically, Iwata and Okada (2011) indicate different effects of

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[6]   They also provide empirical evidence that firms with unusually high or low CSP have higher financial performance than other firms, suggesting that the relationship between CSP and CFP may be U-shaped.

environmental performance on financial performance. For example, greenhouse gas reduction increases financial performance in the whole sample and clean industries, whereas waste emissions generally do not have significant effects on financial performance. Suto and Takehara (2016) find that the effects of corporate social performance on profitability are mixed. The composite CSR is negatively associated with most profitability measures, whereas the employee relationship pillar is positively associated with profitability. Shirasu and Kawakita (2021) find that CSR activities are positively related to financial performance as measured by long-term stock returns. Only a few studies have examined the nonlinear effect of ESG on CFP. For example, Fuji et al. (2013) find a significant inverted U-shaped relationship between ROA and environmental performance calculated by aggregated toxic risk.

Given the diverging findings and limited evidence in Japan, this study aims to fill this research gap by exploring the nonlinear relationship between ownership structure and ESG engagement, as well as the nonlinear relationship between ESG and corporate financial performance.

2.2 Hypothesis Development
Effects of Institutional Ownership on ESG

Extant literature has investigated the role of institutional investors in monitoring, disciplining, and influencing corporate managers' behaviors (Chung et al., 2002). Unlike individual investors, institutional investors are more sophisticated and tend to search for long-term value rather than myopically focusing on near-term profits (Bushee, 1998). In the case of Japan, stable shareholdings with long-term investment horizons made through cross-shareholdings and financial institutions dominate the Japanese equity market (Douthett and Jung, 2001). Such institutional investors are considered "friendly" insiders and can encourage managers to make decisions that focus on long-term firm value (Shuto and Iwasaki, 2014). Since returns from ESG investments are expected to be realized mostly in the long run (Oh et al., 2011), stable institutional investors in Japan might support socially responsible engagements. Moreover, institutional investors are risk-averse (Chaganti and Damanpour, 1991) and may change their stable relationships with a firm by selling their shares if they perceive great risk and uncertainty (Shuto and Iwasaki, 2014). By choosing a similar but socially responsible company, they can achieve the same return with less risk (Graves and Waddock, 1994). Thus, ESG can be viewed as a risk-reducing measure, and institutional investors will be in favor of high social performance.

However, institutional directors with different levels of ownership may provide different outcomes for firms' social performance. Specifically, the role of institutional investors can be ambiguous when institutional ownership is high. The monitoring activities by institutional investors can be costly and may cause principal agency conflicts that arise when majority shareholders abuse their ownership control (Young et al., 2008; García-Meca and Pucheta-Martínez, 2018). Conflicting preferences regarding social engagements may have a detrimental impact on ESG performance (e.g., conflicting

voices from multiple institutional investors may deter the continuous commitment to CSR) (Oh et al., 2017). Empirically, García-Meca and Pucheta-Martínez (2018) find that institutional directors negatively impact CSR reporting.

Therefore, I predict that there will be a nonlinear relationship between institutional ownership and ESG performance. Institutional ownership may have positive effects on ESG as it increases from a low to an intermediate level, while having negative effects on ESG at a high level of institutional ownership. Therefore, I propose the following hypothesis:

H1a There is a nonlinear (inverted U-shaped) relationship between institutional ownership and ESG performance.

Effects of Foreign Ownership on ESG

Since the 2000s, foreign investors have played a major role of shareholders in the Japanese market (Suto and Takehara, 2018).[7] Compared to their domestic counterparts, foreign investors possess little information about a firm's prospects and/or business strategies (Cheung et al., 1999). Thus, they tend to invest in firms with good corporate governance, high social trust, and a good reputation to circumvent the problems associated with information asymmetry (Suto and Takehara, 2018). Particularly, the Japanese institutional environment features cross-owned networks and interlocking ownerships, wherein value-relevant information is shared exclusively within the grouping (Sheard, 1991). In this environment, foreign investors can regard the level of information asymmetry or disclosure transparency as an important factor affecting their investment decisions (Jiang and Kim, 2004). As social and environmental information may help foreign investors in decision-making (Khan et al., 2013), they are inclined to gravitate toward firms with high global credit ratings and positive social reputations to reduce information costs (Suto and Takehara, 2018), and they are likely to force firms to establish transparent corporate governance and consequently encourage them to participate in ESG practices to some extent (Oh et al., 2011).[8] Moreover, socially responsible engagement might be a way for companies to signal their trustworthiness (Siegel and Vitaliano, 2007). Considering the riskiness and uncertainty of investing in a foreign country, foreign investors might show greater preferences for firms with high social performance to avoid risk.

However, it can be difficult for foreign investors to monitor managerial decisions and pressure managers to make socially responsible decisions. For instance, Guo et al. (2015) argue that the distance makes it difficult for foreign investors to monitor a firm's accounting department; thus, firms with high foreign ownership are more likely to engage in earnings management than firms with low

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[7]   Suto and Takehara (2018) find that shareholdings by foreign investors rose from 4.7% in 1990 to 18.8% in 2000. After a temporary drop during the global financial crisis, foreign ownership grew to 30.1% in 2016.

[8]   Prior studies document the monitoring role of foreign investors and suggest that foreign investors can ameliorate the legal environment deficiency by improving firm-level governance (Aggarwal et al., 2011; Guo et al., 2015).

foreign ownership. Additionally, significantly increased foreign ownership may allow foreign owner-managers to become entrenched and pursue opportunistic behaviors in Japan (Ferris and Park, 2005). Previous literature has documented a nonlinear relationship between foreign ownership and enterprise performance (Akimova and Schwödiauer, 2004) or firm value (Ferris and Park, 2005), which shows that foreign owners may also use their influence to siphon off earnings and profits when acquiring a controlling stake in a company.[9] Thus, it is plausible to expect a nonlinear relationship between foreign ownership and ESG performance in Japan. As foreign equity ownership increases, the monitoring role likewise increases, which may lead to an improvement in ESG. However, high foreign ownership levels may result in managerial entrenchment and negatively affect social performance. Hence, I hypothesize:

H1b There is a nonlinear (inverted U-shaped) relationship between foreign ownership and ESG performance.

Effects of Managerial Ownership on ESG

Previous studies have identified two effects of managerial ownership on managers' incentives: the incentive alignment effect and the management entrenchment effect (Morck et al., 1988; Lennox, 2005; Shuto and Takada, 2010). According to the agency theory (Jensen and Meckling, 1976), providing stock to managers can help mitigate agency problems by aligning their interests with those of the shareholders. Therefore, the incentive alignment effect suggests that managers with significant shareholdings would make decisions that maximize shareholder wealth (McConnell and Servaes, 1990; Oh et al., 2017). Concerns for the longer term may motivate managers to engage in social activities to enhance quality products and services and avoid negative reputations stemming from ESG controversies (Johnson and Greening, 1999). Consistent with this argument, Johnson and Greening (1999) find that top management equity is positively related to the product quality dimension of CSP.

By contrast, the management entrenchment effect suggests that managers with greater ownership are likely to have greater control over firms and will entrench themselves for their own interests (Morck et al., 1988; McClelland et al. 2012). If this is the case, firm managers with greater shareholdings may engage in opportunistic behavior for self-serving purposes (Oh et al., 2017). As mentioned before, cross-shareholdings (e.g., Keiretsu in Japan) are very common in Japan. This could enhance managerial entrenchment and insulate managers from market interference in corporate control, such as in hostile takeovers (Isagawa, 2007). This may allow managers to pursue their personal agendas at the expense of other stakeholders. Consequently, managerial ownership is expected to be negatively associated with socially responsible performance. Oh et al. (2011) support this argument and provide evidence that managers from Korean Chaebol (similar to Japanese Keiretsu) firms with significant

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9　Specifically, Akimova and Schwödiauer (2004) find that the impact of foreign ownership on firm performance (sales per employee) is positive only up to a level that falls short of majority ownership. Ferris and Park (2005) find that firm value rises until foreign ownership reaches approximately 40%, and then it begins to decline.

shares are likely to overuse their power given by ownership and thus disengage from CSR.

Considering the above two effects of managerial ownership, I conjecture that the relationship between managerial ownership and ESG performance could be nonlinear. Specifically, Teshima and Shuto (2008) find that the relationship between a manager's shareholding and the level of effort to pursue shareholders' interests is positive for low and high levels of managerial ownership, and the slope becomes flatter or negative for moderate levels of ownership. Thus, the entrenchment effect would be dominant for intermediate levels of managerial ownership, while the alignment effect would be dominant for low and high levels of ownership (Shuto and Takada, 2010). If managers have an extremely low shareholding, they are unlikely to become entrenched because they cannot take control of the firm. As managerial ownership increases from a low to an intermediate level, managers tend to be entrenched in opportunistic behaviors to serve their own interests by reducing social investments because they are less likely to be disciplined. Hence, worse ESG performance can be expected for intermediate levels of managerial ownership. In contrast, a manager with a sufficiently large number of shares has strong incentives to act in line with shareholders' interests by promoting long-term investments such as ESG.[10] Therefore, I hypothesize the following:

H1c There is a nonlinear (U-shaped) relationship between managerial ownership and ESG performance.

Relationship between ESG and Corporate Financial Performance

A common question for business managers is whether "more is better." In the ESG domain, two elements need to be addressed to answer this question: rewards and costs. Specifically, "reward" returned to the firm by stakeholders is correlated with the utility that those stakeholders experience from the firm's social output (Marom, 2006). This utility function can be characterized as a diminishing marginal utility function, which means that the marginal value of the perceived utility of social output will decrease. When the scope and extent of corporate social responsiveness stray beyond stakeholder management, they are likely to regard ESG as an over-investment because such redundant social concerns may have little or no relation to a firm's stakeholder relations (Brammer and Millington, 2008). Therefore, stakeholders may believe that the firm distracts itself from the core

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[10] One may argue that not all shareholders are in favor of ESG. As the returns from ESG investments are expected to be realized in the long period, shareholders who care about the long-term values can be willing to let managers promote ESG engagements. For instance, the Global Steering Group for Impact Investment (2019) conducted a survey about impact investing which aims to create positive social and environmental impact while generating financial returns at the same time. Their report in 2019 presents the increase in the balance of impact investing in Japan (from 71.8 billion JPY in 2017 to 317.9 billion JPY in 2019) and documents the significance of impact investing from the perspective of both entrepreneurs and investors, suggesting that both institutional and individual investors show great interests in investing in ESG firms. Moreover, previous studies (please see Murashima, 2020) also find that Japanese institutional investors can react strongly to negative ESG-related news, showing that institutional investors are concerned about ESG controversies. Therefore, I conjecture that due to the incentive alignment, executives may be more likely to employ firm resources towards ESG investments for long-term profitability and protect firms from reputation risks caused by socially irresponsible activities.

business and thus perceive less value addition gained from ESG practices (Sun et al., 2019).

On the other hand, the cost of managing ESG engagements could become extraordinarily high as the ESG levels increase to a high extent for several reasons. First, socially responsible activities consume considerable corporate resources, and the resource allocation could become increasingly demanding because of the increased competition between social activities and other core business units (Brammer and Millington, 2008). Second, agency costs in terms of stakeholders' concerns are expected to become more significant with increased ESG levels. Excessive ESG performance, which surpasses the levels that key stakeholders can tolerate, may lead to great concerns about managerial misconduct or misuse of corporate resources, resulting in increased agency costs (Wang et al., 2008). Third, firms can use cost-effective equipment for ESG practices (e.g., environmental management) in the beginning while they need to introduce new cost-ineffective equipment to improve social and environmental performance in the future (Fuji et al., 2013). Therefore, it is reasonable that firms with a high level of ESG investment are likely to have a relatively low financial performance because the costs may outweigh the rewards (Meier et al., 2021). Hence, I hypothesize as follows:

H2 Increased ESG performance displays an inverted U-shaped relationship with corporate financial performance.

3. Research Design
Sample and Data
I obtain the financial statements and stock data from the Nikkei NEEDS Financial QUEST database. ESG data is taken from the Refinitiv EIKON database. I first exclude firms working in banking, securities, and insurance. I then drop firms that changed accounting period during the analysis period and delete observations with the number of months in a fiscal period not equal to 12. Next, I exclude firm-years with missing data for variables used in my empirical models and delete observations with negative equity. The above procedures result in a final sample of 4,337 firm-year observations from 2002 to 2017 for Hypothesis 1 and a final sample of 4,003 firm-year observations from 2002 to 2017 for Hypothesis 2.[11] I then winsorize all continuous variables that lie in the upper or lower 1% of the distribution.

Dependent and Independent Variables
ESG Performance
In line with previous ESG literature, I measure ESG performance by ESG scores obtained from the Thomson Reuters' Refinitiv Eikon database (Sassen et al., 2016; Aouadi and Marsat, 2018). Using more than 500 data points and 186 comparable measures, Refinitiv provides comprehensive, transparent, and objective ESG scores to measure a company's relative ESG performance.

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[11] The final sample sizes of four measures of corporate financial performance are different, which are shown in Panel B of Table 1.

Refinitiv classifies non-financial data into the following three pillars: environmental, social, and corporate governance performance. The environmental pillar score (*ENV*) measures a company's performance on emission, innovation, and resource use. The social pillar score (*SOC*) measures a company's performance on community, human rights, product responsibility, and workforce. The governance pillar score (*GOV*) measures a company's performance on CSR strategy, management, and shareholders. Besides, Refinitiv provides the ESG controversies score (*CONTR*) which captures negative media scandals.

Following Demers et al. (2021), I use the comprehensive ESG score (*ESG*) which is a relative sum of the category weights of environmental, social, and corporate governance performance. Besides, I also include the above four ESG pillars in the data analyses.

Ownership Structure

Following Oh et al. (2011) and Oh et al. (2017), I measure institutional ownership (*INS_OWN*) and foreign ownership *(Foreign_OWN)* by taking the proportion of shareholdings by institutional investors and the proportion of shareholdings by foreign investors, respectively. Besides, to capture the ownership by management (*MANA_OWN*), I follow Shuto and Takada (2010) to use the fraction of the shares owned by all directors on the board.

Corporate Financial Performance

Four measures are generated to estimate corporate financial performance based on Aouadi and Marsat (2018) and Ikram et al. (2019). Specifically, Tobin's Q *(Q)* is measured as the ratio of the sum of the market value of equity and the book value of debt to the book value of total assets. Log of Tobin's Q (*LnQ2*) represents the natural log of the alternative Q ratio, which is the book value of total assets minus the book value of equity and balance sheet deferred taxes plus the market value of equity, all divided by the book value of total assets. Operating income on assets (*OIA*) is calculated as the operating income divided by total assets. Furthermore, I include return on equity (*ROE*) as the ratio of net income to shareholders' equity.

Regression Models

Ownership Structure and ESG Performance

To estimate the relationship between ownership structure and ESG performance, I follow Oh et al. (2017) to use the quadratic equation in OLS regression with robust standard errors to correct for heteroskedasticity. The equation estimated for this analysis is as follows:

$$
\begin{aligned}
ESG_{i,t} = \ & \beta_0 + \beta_1 INS\_OWN_{i,t} + \beta_2 INS\_OWN_{i,t}^2 + \beta_3 Foreign\_OWN_{i,t} \\
& + \beta_4 Foreign\_OWN_{i,t}^2 + \beta_5 MANA\_OWN_{i,t} + \beta_6 MANA\_OWN_{i,t}^2 \\
& + \beta_7 SIZE_{i,t} + \beta_8 ROA_{i,t} + \beta_9 LEV_{i,t} + Year\ Dummy \\
& + Industry\ Dummy + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

where i represents individual firms and t denotes time periods (year). To capture the nonlinear pattern, I include the quadric terms of three variables regarding ownership structure. Other variables are control variables that have been commonly used in previous studies (Khan et al., 2013; Oh et al., 2017). Specifically, firm size (*SIZE*) is measured as the natural log of total assets. Return on assets (*ROA*) represents the firm performance, computed by income before extraordinary items divided by lagged total assets. Financial leverage (*LEV*) is the ratio of the book value of total debts to total assets. Besides, I also include year and industry fixed effects. According to the hypotheses, the sign of quadratic terms indicates whether the quadratic curve is U-shaped or inversely U-shaped.

ESG Performance and Corporate Financial Performance

Following Aouadi and Marsat (2018), Sun et al. (2019), and Meier et al. (2021), I use the following equation to estimate the relationship between ESG performance and firm financial performance:

$$
\begin{aligned}
CFP_{i,t+1} = {} & \beta_0 + \beta_1 ESG_{i,t} + \beta_2 ESG^2_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 ROA_{i,t} + \beta_5 LEV_{i,t} \\
& + \beta_6 GROWTH_{i,t} + \beta_7 RD_{i,t} + \beta_8 AD_{i,t} + \beta_9 CAPEX_{i,t} + \beta_{10} DIV_{i,t} \\
& + Year\ Dummy + Industry\ Dummy + \varepsilon_{i,t}
\end{aligned}
\tag{2}
$$

where sales growth (*GROWTH*) is captured as the ratio of sales in the current year to the prior year. R&D expense ratio (*RD*) is measured as the ratio of R&D expenditure to total sales. Advertising expense ratio (*AD*) is measured as the ratio of advertising expense to total sales. Capital expenditure (*CAPEX*) represents total capital expenditure divided by total assets. Dividend yield (*DIV*) represents dividend per share divided by stock price per share. To avoid endogeneity, I use the one-year-ahead corporate financial performance (*CFP*$_{i,t+1}$, which represents four measures of financial performance) as the dependent variable. *ESG* and *ESG*^{2} are the independent variable and its square, respectively. Based on the hypothesis, the coefficient of *ESG*^{2} captures the inverted U-shaped pattern and thus is expected to be significantly negative.

4. Results

Descriptive Statistics

Table 1 reports descriptive statistics for the variables under analysis. Specifically, Panel A shows descriptive statistics for Hypothesis 1 and Panel B shows descriptive statistics for Hypothesis 2. As shown in Panel A, the mean (median) overall Refinitiv ESG score for sample firms is approximately 0.404 (0.406). The average institutional ownership is 32.5% and the mean of foreign ownership is 26.2%. The managerial ownership has a range from 0% to 69.9%, with a mean of 1.5% and a median of 0.1%. The above results indicate that managerial ownership is less than institutional and foreign ownership.[12]

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[12] This result is very similar to the statistic reported by Shuto and Iwasaki (2014). In their descriptive statistics, managerial ownership has a mean of 2.4% and a median of 0.4%. Moreover, their results also show that managerial ownership in Japanese firms is less than institutional and foreign shareholdings.

Panel B shows that Tobin's Q has a mean of 1.357 and a median of 1.143, while the average $LnQ2$ is 0.207 and the mean of OIA is 0.065. The average ROE is 8.1% with a median of 8%. Other control variables exhibit similar descriptive statistics to estimates by previous literature. For example, sales growth (mean 1.041) varies from 0.41 to 2.286, with a median of 1.034, which is similar to the descriptive statistics of Aouadi and Marsat (2018).[13]

Table 1 Descriptive Statistics

Panel A: Descriptive Statistics for Hypothesis 1							
	N	Mean	SD	Min	p25	Median	p75	Max
ESG	4,337	.404	.201	.035	.235	.406	.568	.85
INS_OWN	4,337	.325	.113	.009	.249	.338	.41	.618
Foreign_OWN	4,337	.262	.111	.004	.18	.256	.338	.541
MANA_OWN	4,337	.015	.051	0	0	.001	.003	.699
SIZE	4,337	13.023	.909	9.514	12.363	12.984	13.718	14.861
ROA	4,337	.044	.041	-.251	.02	.037	.061	.233
LEV	4,337	.509	.199	.07	.354	.52	.667	.967
Panel B: Descriptive Statistics for Hypothesis 2								
	N	Mean	SD	Min	p25	Median	p75	Max
Q	4,003	1.357	.771	.466	.984	1.143	1.438	10.066
LnQ2	4,003	.207	.373	-.718	-.031	.121	.351	2.307
OIA	4,325	.065	.051	-.245	.033	.056	.087	.266
ROE	4,338	.081	.084	-1.06	.049	.08	.115	.465
ESG	4,338	.403	.201	.035	.233	.405	.566	.85
SIZE	4,338	13.032	.911	9.514	12.372	12.993	13.737	14.861
ROA	4,338	.044	.041	-.251	.02	.037	.061	.233
LEV	4,338	.508	.199	.07	.353	.519	.666	.967
GROWTH	4,338	1.041	.14	.41	.981	1.034	1.093	2.286
RD	4,338	.028	.038	0	.001	.016	.038	.269
AD	4,338	.011	.021	0	0	0	.016	.155
CAPIX	4,338	.05	.034	0	.027	.044	.064	.245
DIV	4,338	.123	.899	0	.008	.016	.025	18.971

Table 2 presents the correlation matrix. As shown in Table 2, ESG is significantly positively correlated with institutional ownership and foreign ownership at the 1% level (with the coefficient of 0.155 and 0.262, respectively), while managerial ownership is negatively correlated with ESG (-0.178) at the 1% level. The above results are consistent with the correlation results reported by Oh et al. (2011). Besides, all financial performance measures are negatively associated with ESG performance at the 1% level, which is consistent with Ooi et al. (2021).[14]

Results of Hypothesis 1

Table 3 reports the results of regression analyses examining the nonlinear relationship between ownership structure and ESG performance. To estimate the empirical model, I run stepwise robust

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13 In the descriptive statistics of Aouadi and Marsat (2018), sales growth ranges from 0.488 to 3.744, with a mean of 1.126 and a median of 1.090.

14 Specifically, Ooi et al. (2021) report that stakeholder CSR and environmental CSR are negatively related to Tobin's Q in Pearson correlation test.

Table 2 Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) ESG	1.000															
(2) INS_OWN	0.155***	1.000														
(3) Foreign_OWN	0.262***	0.368***	1.000													
(4) MANA_OWN	-0.178***	-0.346***	-0.148***	1.000												
(5) Q	-0.086***	-0.102***	0.169***	0.271***	1.000											
(6) LnQ2	-0.076***	-0.048***	0.240***	0.244***	0.897***	1.000										
(7) QIA	-0.093***	0.013***	0.237***	0.205***	0.257***	0.301***	1.000									
(8) ROE	-0.075***	0.074***	0.113***	0.067***	0.079***	0.103***	0.682***	1.000								
(9) SIZE	0.442***	0.563***	0.691***	-0.267***	0.210***	0.308***	0.290***	0.207***	1.000							
(10) ROA	-0.111***	0.034***	0.247***	0.148***	0.226***	0.257***	0.930***	0.726***	0.289***	1.000						
(11) LEV	0.139***	0.103***	-0.186***	-0.090***	-0.096***	0.019***	-0.244***	-0.051***	-0.101***	-0.250***	1.000					
(12) GROWTH	-0.068***	-0.027***	0.086***	0.125***	0.249***	0.271***	0.321***	0.249***	0.134***	0.339***	-0.027***	1.000				
(13) RD	0.262***	0.113***	0.193***	-0.075***	0.113***	0.116***	-0.105***	-0.097***	0.178***	-0.096***	-0.247***	-0.021***	1.000			
(14) AD	0.007	-0.095***	0.081***	0.203***	0.201***	0.202***	0.099***	0.015***	0.073***	0.077***	-0.101***	0.040***	0.003	1.000		
(15) CAPIX	0.039***	0.038***	0.093***	0.060***	0.086***	0.131***	0.107***	0.048***	0.153***	0.090***	0.016***	0.099***	-0.010***	0.030***	1.000	
(16) DIV	0.047***	-0.121***	-0.038***	0.182***	0.045***	0.059***	0.133***	0.067***	-0.089***	0.105***	-0.016***	0.041***	-0.038***	0.049***	0.038***	1.000

Note: This table reports the correlations for the sample. *, **, and *** refer to significance level at 10%, 5%, and 1%, respectively.

regressions by first examining three ownership measures and their quadratic terms individually and then including all of them in the model.[15] Specifically, Model 1 includes institutional ownership and its quadratic term. The coefficient of the linear term (*INS_OWN*) is significantly positive while the coefficient of the quadratic term (*INS_OWN*^{2}) is insignificant, showing that the effect of institutional ownership on ESG is not in a nonlinear pattern. Model 2 includes foreign ownership and its second-degree term. The significantly negative coefficient of the quadratic term (*Foreign_OWN*^{2}) reflects the possible existence of an inverted U-shaped relationship (β = -0.811, with a *t*-value of -4.992). Following Meier et al. (2021), I further conduct the Lind and Mehlum test for the inverted U-shaped relationship. The results show that both slopes are significant (*p*-value = 0.000 for the positive slope and *p*-value = 0.001 for the negative slope), with a *p*-value of 0.001 for the overall test. All these results provide very strong support for the existence of an inverted U-shaped relationship between foreign ownership and ESG. In Model 3, managerial ownership and its quadratic term are added. As shown in column (3), the coefficient of the linear term (*MANA_OWN*) is significantly negative and the coefficient of the quadratic term (*MANA_OWN*^{2}) is significantly positive (β = 1.080, with a *t*-value of 4.772). Further results of the Lind and Mehlum test show that both slopes are significant (the *p*-values for the negative slope and the positive slope are 0.000 and 0.000, respectively), with a *p*-value of 0.000 for the overall test. This indicates that the relationship between managerial ownership and ESG is a significant U-shaped pattern.

Model 4 includes the linear term of institutional ownership, the linear term of foreign and managerial ownership, and their quadratic terms. Model 5 represents the full regression equation which includes all terms. As shown in columns (4)-(5), the coefficient of *INS_OWN* becomes insignificant after adding *INS_OWN*^{2} and the incremental contribution is also insignificant.[16] Overall, Table 3 supports an inverted U-shaped relationship between foreign ownership and ESG and a U-shaped relationship between managerial ownership and ESG, while the results show that the effect of institutional ownership on ESG is positive and linear. Thus, the results in Table 3 support **H1b** and **H1c**.

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[15] The values of adjusted R-squares in Table 3 are consistent with those in Khan et al. (2013) that examine the effects of corporate governance characteristics (such as ownership structures) on CSR disclosure performance. Specifically, the values of adjusted R-squares for regressions of CSR disclosures on managerial ownership and foreign ownership in their study are 0.446 and 0.447, respectively. In addition, the value of adjusted R-square for regression of CSR disclosure on all corporate governance variables is 0.562.

[16] The partial F-test shows the addition is insignificant ($F = 0.65$, $p = 0.422$).

Table 3　Ownership Structure and ESG Performance

	(1) ESG	(2) ESG	(3) ESG	(4) ESG	(5) ESG
INS_OWN	0.182*			0.084***	0.003
	(1.805)			(3.350)	(0.029)
INS_OWN^2	-0.056				0.131
	(-0.354)				(0.803)
Foreign_OWN		0.587***		0.541***	0.549***
		(6.358)		(5.569)	(5.589)
Foreign_OWN^2		-0.811***		-0.742***	-0.747***
		(-4.992)		(-4.347)	(-4.366)
MANA_OWN			-0.642***	-0.624***	-0.621***
			(-6.036)	(-5.642)	(-5.612)
MANA_OWN^2			1.080***	1.117***	1.098***
			(4.772)	(4.755)	(4.686)
SIZE	0.111***	0.106***	0.111***	0.103***	0.103***
	(40.743)	(35.458)	(40.584)	(34.533)	(34.489)
ROA	-0.625***	-0.653***	-0.593***	-0.595***	-0.603***
	(-9.387)	(-9.914)	(-8.870)	(-8.953)	(-8.905)
LEV	0.225***	0.254***	0.234***	0.243***	0.243***
	(13.752)	(15.259)	(14.443)	(14.891)	(14.870)
Constant	-1.374***	-1.319***	-1.298***	-1.315***	-1.308***
	(-28.012)	(-26.014)	(-26.715)	(-25.729)	(-25.252)
Year, Industry	Control	Control	Control	Control	Control
Observations	4,337	4,337	4,337	4,337	4,337
Adj. R^2	0.501	0.503	0.502	0.510	0.510
F-stat	115.82	117.16	115.72	113.47	111.37

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (2) and (3) are 0.001 and 0.000, respectively. For column (4), the *p*-values for the overall test of the Lind and Mehlum test are 0.002 for *Foreign_OWN^2* and 0.000 for *MANA_OWN^2*, respectively. For column (5), the *p*-values for the overall test of the Lind and Mehlum test are 0.002 for *Foreign_OWN^2* and 0.000 for *MANA_OWN^2*, respectively. *p < .1, **p < .05, ***p < .01 (two-sided).

Table 4 reports the results of relationship between ownership structure and ESG performance regarding four ESG pillars.[17] The results of coefficients of *INS_OWN* in columns (1)-(4) show that there is a positive relationship between institutional ownership and each ESG pillar at less than the 5% level. While the linear term of foreign ownership is significantly positive at the 1% level in columns (1)-(3) and significantly negative in column (4), the quadratic term (*Foreign_OWN^2*) is significantly negative only in column (1) (β = -0.634, with a *t*-value of -3.303) and column (3) (β = -1.222, with a *t*-value of -4.918). Further results of the Lind and Mehlum test are statistically significant, suggesting an inverted U-shaped relationship between foreign ownership and *SOC* (*ENV*) performance. The results of managerial ownership (*MANA_OWN*) and its second-degree term (*MANA_OWN^2*) show that there is a U-shaped relationship between managerial ownership and first three ESG pillars: *SOC*, *GOV*, and *ENV* performance, while there is no significant relationship between managerial ownership and ESG controversies.

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[17]　As Table 3 shows that the relationship between institutional ownership and ESG is linear, I only include the linear term of *INS_OWN* in Table 4.

Table 4　Ownership Structure and ESG Performance: ESG pillars

	(1) SOC	(2) GOV	(3) ENV	(4) CONTR
INS_OWN	0.063**	0.074**	0.097***	0.070**
	(2.127)	(2.169)	(2.659)	(2.486)
Foreign_OWN	0.396***	0.513***	0.658***	-0.277***
	(3.668)	(4.167)	(4.578)	(-3.000)
Foreign_OWN^2	-0.634***	-0.272	-1.222***	0.281*
	(-3.303)	(-1.285)	(-4.918)	(1.709)
MANA_OWN	-0.474***	-0.563***	-0.917***	0.062
	(-3.600)	(-4.242)	(-6.669)	(0.891)
MANA_OWN^2	0.987***	0.997***	1.586***	-0.237
	(3.323)	(3.182)	(5.469)	(-1.645)
SIZE	0.105***	0.085***	0.126***	-0.025***
	(28.780)	(21.216)	(30.583)	(-7.664)
ROA	-0.552***	-0.510***	-0.955***	0.475***
	(-6.907)	(-5.524)	(-10.182)	(5.696)
LEV	0.272***	0.134***	0.307***	-0.158***
	(14.223)	(6.373)	(13.557)	(-8.667)
Constant	-1.405***	-0.928***	-1.608***	1.376***
	(-22.423)	(-13.367)	(-19.598)	(22.179)
Year, Industry	Control	Control	Control	Control
Observations	4,337	4,337	4,337	4,337
Adj. R^2	0.429	0.307	0.529	0.127
F-stat	83.18	46.86	142.71	7.48

Note: For column (1), the p-values for the overall test of the Lind and Mehlum test for *Foreign_OWN^2* and *MANA_OWN^2* are 0.003 and 0.001, respectively. For column (2), the p-value for the overall test of the Lind and Mehlum test is 0.001 for *MANA_OWN^2*. For column (3), the p-values for the overall test of the Lind and Mehlum test are 0.000 for *Foreign_OWN^2* and 0.000 for *MANA_OWN^2*, respectively. For column (4), the p-value for the overall test of the Lind and Mehlum test is 0.366 for *Foreign_OWN^2*. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Results of Hypothesis 2

Table 5 presents the results of regression analyses examining the nonlinear relationship between ESG performance and corporate financial performance.[18] As shown in columns (1)-(4), the results of the quadratic term of ESG (ESG^2) are statistically significant at less than the 5% level, with the coefficient of -0.702 for Q_{t+1}, -0.371 for $LnQ2_{t+1}$, -0.025 for OIA_{t+1}, and -0.069 for ROE_{t+1}, respectively. These results support a probable quadratic relationship between ESG and corporate financial performance. Further results of the Lind and Mehlum test show that both slopes are significant when the dependent variable is Q_{t+1} (with a p-value of 0.051 for the positive slope and a p-value of 0.00001 for the negative slope), $LnQ2_{t+1}$ (with a p-value of 0.060 for the positive slope and a p-value of 0.000 for the negative slope), and ROE_{t+1} (with a p-value of 0.056 for the positive slope and a p-value of 0.004 for the negative slope). Moreover, the p-values of the overall test in columns (1), (2), and (4) are less than 10%. These results indicate that the relationship between ESG and corporate financial performance is an inverted U-shaped pattern. The results of other control variables are generally consistent with

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[18] The values of adjusted R-squares in Table 5 are consistent with those of R-squares in Nollet et al. (2016) that investigate the relationship between corporate social performance and financial performance. In their study, the values of R-squares range from 0.3551 to 0.6043 when dependent variables are accounting-based performance indicators.

previous studies (e.g., Aouadi and Marsat, 2018). For example, there is a significantly positive relationship between *ROA* and one-year-ahead corporate financial performance. In addition, *RD* is statistically positively related to Q_{t+1} and $LnQ2_{t+1}$ while negatively related to $OIA_{t+1.}$

Overall, the presence of a significant negative coefficient for ESG^2 in Table 5 and the statistically significant results of the Lind and Mehlum test reflect an inverted U-shaped relationship between ESG and corporate financial performance. Thus, the results in Table 5 support **H2**.

Table 5   ESG Performance and Corporate Financial Performance

	(1) Q_{t+1}	(2) $LnQ2_{t+1}$	(3) OIA_{t+1}	(4) ROE_{t+1}
ESG	0.338*	0.157*	0.013	0.044*
	(1.765)	(1.716)	(1.215)	(1.650)
ESG^2	-0.702***	-0.371***	-0.025**	-0.069**
	(-3.186)	(-3.445)	(-2.024)	(-2.240)
SIZE	0.088***	0.067***	0.005***	0.007***
	(6.016)	(9.780)	(6.749)	(3.659)
ROA	8.495***	4.365***	0.849***	1.237***
	(12.738)	(15.493)	(30.231)	(21.885)
LEV	0.045	0.054	-0.010***	0.097***
	(0.620)	(1.444)	(-2.765)	(10.562)
GROWTH	0.046	-0.010	-0.001	-0.006
	(0.433)	(-0.206)	(-0.199)	(-0.564)
RD	2.702***	1.387***	-0.068*	-0.075
	(4.219)	(4.162)	(-1.683)	(-0.971)
AD	0.899	0.202	0.002	0.020
	(1.051)	(0.659)	(0.054)	(0.425)
CAPIX	0.476	0.278	0.026	-0.074*
	(1.110)	(1.521)	(1.233)	(-1.717)
DIV	-0.012*	-0.009**	0.002***	0.001*
	(-1.759)	(-2.321)	(3.739)	(1.953)
Constant	-0.352*	-0.888***	-0.028**	-0.087***
	(-1.654)	(-8.486)	(-2.327)	(-3.068)
Year, Industry	Control	Control	Control	Control
Observations	4,003	4,003	4,325	4,338
Adj. R^2	0.446	0.524	0.659	0.388
F-stat	30.25	62.99	99.92	33.90

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (1)-(4) are 0.051, 0.060, 0.128, and 0.056, respectively. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

The results of the relationship between ESG pillars and corporate financial performance are displayed in Table 6. All ESG pillars and their second-degree terms are included in each model. As shown in columns (1) and (2), the coefficients of SOC^2 are significantly negative and the coefficients of $CONTR^2$ are significantly positive. Further results of the Lind and Mehlum test indicate that the *p*-values for the overall test for SOC^2 are 0.100 for column (1) and 0.005 for column (2), respectively, suggesting an inverted U-shaped pattern at less than the 10% level. In addition, the *p*-values for the overall test for $CONTR^2$ are 0.030 for column (1) and 0.034 for column (2), respectively, indicating a U-shaped

relationship between ESG controversies and firm value. The results of columns (3) and (4) show that the coefficients of GOV^2 are significantly negative at less than the 10% level. Further results of the Lind and Mehlum test confirm that the governance pillar has an inverted U-shaped effect on financial performance.

Table 6　ESG Performance and Corporate Financial Performance: ESG pillars

	(1) Q_{t+1}	(2) $LnQ2_{t+1}$	(3) OIA_{t+1}	(4) ROE_{t+1}
SOC	0.268	0.232***	0.006	0.002
	(1.288)	(2.587)	(0.612)	(0.098)
SOC^2	-0.413*	-0.306***	-0.009	-0.031
	(-1.851)	(-2.922)	(-0.782)	(-1.096)
GOV	0.174	0.112	0.018*	0.047**
	(0.971)	(1.414)	(1.933)	(2.351)
GOV^2	-0.181	-0.118	-0.017*	-0.046**
	(-1.105)	(-1.526)	(-1.822)	(-2.254)
ENV	-0.229*	-0.114*	-0.009	0.007
	(-1.737)	(-1.760)	(-1.347)	(0.429)
ENV^2	0.042	-0.031	0.001	-0.004
	(0.346)	(-0.492)	(0.192)	(-0.248)
CONTR	-0.533*	-0.299*	-0.013	0.045
	(-1.888)	(-1.862)	(-0.712)	(0.674)
$CONTR^2$	0.438**	0.274**	0.015	-0.015
	(1.973)	(2.199)	(1.078)	(-0.317)
SIZE	0.092***	0.070***	0.006***	0.008***
	(6.255)	(10.063)	(7.048)	(3.892)
ROA	8.401***	4.288***	0.843***	1.231***
	(12.442)	(15.046)	(29.899)	(21.815)
LEV	0.070	0.071*	-0.008**	0.103***
	(0.934)	(1.853)	(-2.194)	(10.982)
GROWTH	0.045	-0.012	-0.002	-0.008
	(0.428)	(-0.237)	(-0.269)	(-0.761)
RD	2.701***	1.394***	-0.067*	-0.066
	(4.268)	(4.230)	(-1.654)	(-0.845)
AD	0.831	0.183	0.002	0.049
	(0.956)	(0.588)	(0.080)	(1.049)
CAPIX	0.502	0.269	0.028	-0.074*
	(1.169)	(1.471)	(1.270)	(-1.690)
DIV	-0.011	-0.008*	0.002***	0.002**
	(-1.535)	(-1.945)	(3.920)	(2.304)
Constant	-0.295	-0.908***	-0.036***	-0.127***
	(-1.352)	(-8.149)	(-2.674)	(-3.753)
Year, Industry	Control	Control	Control	Control
Observations	4,003	4,003	4,325	4,338
Adj. R^2	0.446	0.527	0.660	0.391
F-stat	28.25	57.82	94.03	31.82

Note: For column (1), the p-values for the overall test of the Lind and Mehlum test for SOC^2 and $CONTR^2$ are 0.100 and 0.030, respectively. For column (2), the p-values for the overall test of the Lind and Mehlum test are 0.005 for SOC^2 and 0.034 for $CONTR^2$, respectively. For column (3), the p-value for the overall test of the Lind and Mehlum test is 0.059 for GOV^2. For column (4), the p-value for the overall test of the Lind and Mehlum test is 0.023 for GOV^2. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Table 7 Robustness Tests

Panel A: Ownership Structure and ESG Performance

Alternative ESG measure 1

	(1) ESGequal	(2) ESGequal	(3) ESGequal	(4) ESGequal
INS_OWN	0.226**			0.079***
	(2.232)			(3.150)
INS_OWN^2	-0.137			
	(-0.861)			
Foreign_OWN		0.560***		0.521***
		(6.062)		(5.365)
Foreign_OWN^2		-0.767***		-0.708***
		(-4.728)		(-4.166)
MANA_OWN			-0.669***	-0.653***
			(-6.558)	(-6.101)
MANA_OWN^2			1.155***	1.192***
			(5.208)	(5.061)
Other Control Variables	Yes	Yes	Yes	Yes
Year, Industry	Control	Control	Control	Control
Observations	4,337	4,337	4,337	4,337
Adj. R^2	0.517	0.519	0.519	0.526
F-stat	123.75	125.64	124.92	122.39

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (2) and (3) are 0.001 and 0.000, respectively. For column (4), the *p*-values for the overall test of the Lind and Mehlum test are 0.004 for *Foreign_OWN^2* and 0.000 for *MANA_OWN^2*, respectively. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Alternative ESG measure 2

	(1) ESGC	(2) ESGC	(3) ESGC	(4) ESGC
INS_OWN	0.150			0.100***
	(1.525)			(4.010)
INS_OWN^2	0.023			
	(0.150)			
Foreign_OWN		0.560***		0.498***
		(6.095)		(5.144)
Foreign_OWN^2		-0.815***		-0.719***
		(-5.015)		(-4.220)
MANA_OWN			-0.648***	-0.618***
			(-6.290)	(-5.785)
MANA_OWN^2			1.052***	1.063***
			(4.775)	(4.671)
Other Control Variables	Yes	Yes	Yes	Yes
Year, Industry	Control	Control	Control	Control
Observations	4,337	4,337	4,337	4,337
Adj. R^2	0.466	0.466	0.467	0.474
F-stat	95.32	93.97	93.81	92.46

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (2) and (3) are 0.0002 and 0.000, respectively. For column (4), the *p*-values for the overall test of the Lind and Mehlum test are 0.001 for *Foreign_OWN^2* and 0.000 for *MANA_OWN^2*, respectively. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Panel B: ESG Performance and Corporate Financial Performance				
Alternative ESG measure 1				
	(1) Q_{t+1}	(2) $LnQ2_{t+1}$	(3) OIA_{t+1}	(4) ROE_{t+1}
ESGequal	0.258	0.157*	0.011	0.052**
	(1.320)	(1.712)	(1.060)	(2.021)
ESGequal^2	-0.609***	-0.373***	-0.024*	-0.078***
	(-2.753)	(-3.510)	(-1.958)	(-2.633)
Other Control Variables	Yes	Yes	Yes	Yes
Year, Industry	Control	Control	Control	Control
Observations	4,003	4,003	4,325	4,338
Adj. R^2	0.446	0.525	0.659	0.388
F-stat	30.40	63.08	99.84	33.76

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (1)-(4) are 0.117, 0.061, 0.165, and 0.025, respectively. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Alternative ESG measure 2				
ESGC	0.327*	0.113	0.011	0.039
	(1.652)	(1.181)	(1.048)	(1.433)
ESGC^2	-0.674***	-0.294***	-0.021*	-0.057*
	(-2.965)	(-2.601)	(-1.731)	(-1.777)
Other Control Variables	Yes	Yes	Yes	Yes
Year, Industry	Control	Control	Control	Control
Observations	4,003	4,003	4,325	4,338
Adj. R^2	0.445	0.523	0.659	0.387
F-stat	30.18	62.64	99.39	33.74

Note: The *p*-values for the overall test of the Lind and Mehlum test for columns (1)-(4) are 0.063, 0.148, 0.163, and 0.082, respectively. *$p < .1$, **$p < .05$, ***$p < .01$ (two-sided).

Robustness Test

To test the robustness, this study also conducts regressions based on alternative proxies for ESG performance. Specifically, I first follow Aouadi and Marsat (2018) and Sassen et al. (2016) to calculate an ESG score (*ESGequal*) which consists of an equally weighted average of the three ESG pillar scores. My second alternative proxy for ESG performance is the comprehensive ESGC score (*ESGC*) provided by Refinitiv, which is calculated as the weighted average of the ESG scores and ESG controversies score per fiscal period. Overall, the results shown in Table 7 are qualitatively identical to those reported in Table 3 and Table 5.

5. Conclusion

This study reexamines the relationship between ownership structure and ESG performance in Japan and investigates the effects of ESG on corporate financial performance. In particular, this study challenges the traditional linear relationship between ownership structure and ESG as well as the relationship between ESG and CFP shown in Japanese literature and provides supplementary evidence on the nonlinear relationship. Following Oh et al. (2017), Sun et al. (2019), and Meier et al. (2021), I employ the quadratic equation in OLS regression with robust standard errors to test the hypotheses. The results indicate an inverted U-shaped relationship between foreign ownership and ESG performance and a U-shaped relationship between managerial ownership and ESG performance. However, the effect of institutional ownership on ESG is positive and linear. Further results regarding the ESG pillars indicate that the above foreign ownership-ESG link is significant only in the social and environmental pillars, while the above managerial ownership-ESG link is significant in the social, governance, and environmental pillars. Moreover, I find that ESG links to corporate financial performance through an inverted U-shaped pattern, and such relationships mainly result from the social pillar and governance pillar when the dependent variables are firm values (e.g., Tobin's Q) and profitability (e.g., operating income on assets and return on equity), respectively. Overall, this study advances our understanding of the relationships between ownership structures and firms' ESG performance as well as the effects of ESG on financial performance in the Japanese capital market.

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