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When State Meets Market: Partial Privatization, Institutional Pressures, and ESG Performance

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Abstract

Ownership structure is usually treated as a background control variable in ESG research rather than as a governance mechanism in its own right. This study examines whether that treatment overlooks something important, focusing on partial privatization — *the partial divestment of state shares in listed firms* — as a hybrid ownership form that combines state and private logics. Using 28,796 firm-year observations from Chinese listed firms over 2009–2022, we find that partial privatization is positively associated with ESG performance, and that this association is stronger for firms in more developed regions and in more competitive product markets. We further show that the ESG gains linked to partial privatization carry through to higher future firm value. The results hold across a battery of endogeneity tests, including lagged models, firm fixed effects, propensity score matching, a difference-in-differences design around privatization events, and Oster’s (2019) sensitivity analysis. Rather than confirming a uniform ownership effect, the findings indicate that partial privatization improves ESG performance conditionally: institutional development and market discipline are what activate the ESG benefits of hybrid ownership. Overall, our findings offer important implications for policymakers, investors, and regulators seeking to align ownership reforms with sustainable development objectives in emerging economies.

Keywords: Partial privatization; ESG performance; regional development; market competition; institutional pressure

1. Introduction

“Partnerships between public and private sectors can deliver the best of both worlds—efficiency and innovation from private enterprise and a commitment to the public good.”

(Richard Branson - Founder, Virgin Group)

Global challenges such as climate change, widening social inequality, and the transition toward a circular economy have made environmental, social, and governance (ESG) performance a strategic imperative rather than a discretionary choice. Firms that neglect ESG face escalating financial, environmental, and reputational risks, as evidenced by the \$310 billion in climate-related economic losses recorded globally in 2024 (Swiss Re Institute, 2024). At the same time, poor labour practices and gender inequality in leadership continue to undermine organizational legitimacy and industry reputations (Simpliciano et al., 2022). Regulatory initiatives such as the EU’s Corporate Sustainability Reporting Directive (CSRD), increasing investor scrutiny that frames climate risk as investment risk (Scanlan, 2020), and rising expectations from consumers and employees further reinforce ESG as central to corporate resilience and long-term value creation (Willige, 2021; Aziz, 2020).

Indeed, ESG research has grown in recent years, identifying antecedents at the organizational (board composition, executive incentives), policy (environmental taxes), market (competition, uncertainty), technological (digital transformation), and national-institutional levels (Lozano & Martínez-Ferrero, 2022; Tamimi & Sebastianelli, 2017; Disli et al., 2022; Baldini et al., 2018; Su et al., 2023; Peng et al., 2023; Ullah et al., 2022). This literature is valuable, but it mostly treats ownership structure as a control variable. It rarely explores how ownership itself shapes firms’ ESG strategies. In particular, one ownership arrangement (i.e., partial privatization) has been overlooked. Partial privatisation creates hybrid organizations that sit between state and market logics. Although partial privatisation is common in emerging economies (Estrin & Pelletier, 2018; Radić et al., 2021), it has thus far received little attention in the ESG literature. We, therefore, do not know whether partially privatized firms differ from fully state-owned or fully private firms in their ESG engagement, or under what conditions any difference becomes more pronounced. This is important in economies where governments remain influential shareholders even after listing.

This gap motivates our core research question: does partial privatization enhance firms' ESG performance, and under what conditions? We pursue two objectives: (1) test the relationship between partial privatization and ESG performance, and (2) identify the institutional and market conditions that strengthen it. We anchor the study primarily in institutional theory, which treats partially privatized firms as hybrid organizations subject to competing and complex institutional logics (Pache & Santos, 2013; Greenwood et al., 2011). State logic favours political and social objectives, while market logic favours efficiency and shareholder returns. Partial privatization changes the balance between the two, and institutional theory predicts that firms respond to this shift strategically rather than passively (Oliver, 1991; Meyer & Rowan, 1977).

We use stakeholder theory, the resource-based view (RBV), and legitimacy theory as complementary mechanisms operating within this institutional frame. Within this theoretical framing, stakeholder theory explains *why* new (private) shareholders create pressure for ESG engagement; RBV explains *how* firms acquire the resources to act on that pressure; and legitimacy theory explains *what* firms gain (e.g., continued social and regulatory acceptance) from doing so. Collectively, these mechanisms predict that partial privatization should raise ESG performance only where institutional and competitive pressures are strong enough to convert the ownership change into real ESG investment, rather than doing so uniformly across all firms.

We test this using 28,796 firm-year observations from Chinese listed firms spanning 2009–2022. The results show that partial privatization is positively associated with ESG performance, suggesting that reduced state ownership can improve firms' environmental and social engagement and governance quality. This effect is significantly stronger in more developed regions and in highly competitive markets, indicating that institutional development and market discipline amplify the ESG benefits of hybrid ownership. We further show that ESG improvements stemming from partial privatization are associated with higher future firm performance, consistent with the view that ESG engagement builds stakeholder trust, reduces operational risk, and supports growth (Eccles et al., 2014; Friede et al., 2015).

The study makes at least three contributions to the literature. First, it moves ESG-ownership research beyond the traditional state-versus-private dichotomy by treating partial privatization as a distinct hybrid governance condition, anchored in institutional theory rather than in a loose combination of separate theories. Second, prior mixed-ownership studies have largely tested a direct ownership–ESG link (Doshi, Jain, Sharma, Mukherjee, & Kumar, 2024; Bilyay-Erdogan & Öztürk, 2023). We depart from these studies by identifying the institutional conditions (namely, regional development and product-market competition) under which that link strengthens or disappears, and by linking the ESG gains to future firm value. Third, it provides context-specific evidence from China, where partial privatization is widespread and state influence remains strong, offering policy-relevant implications for regulators working on mixed-ownership reform and institutional development.

The remainder of the paper is organized as follows. Section 2 develops the theoretical framework and hypotheses. Section 3 describes the data, variables, and estimation methodology. Section 4 presents the empirical results, additional tests, robustness checks, and endogeneity analyses. Section 5 discusses the findings in relation to prior literature. Section 6 concludes with theoretical and policy implications.

2. Theory and hypotheses

2.1. Theoretical underpinning: Partial privatisation and institutional complexity

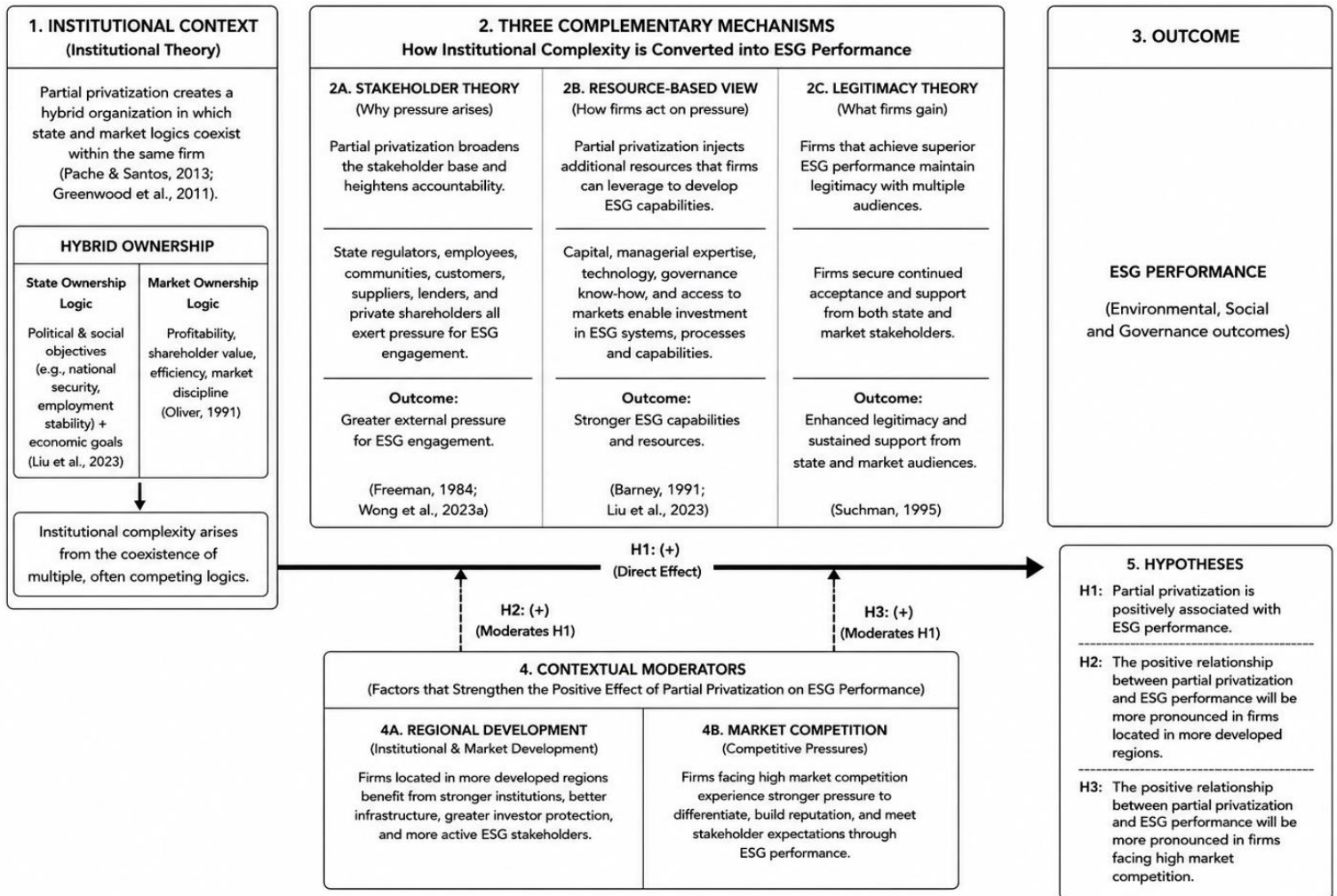
This study is underpinned by institutional theory. Partial privatization creates a hybrid organization in which state and market logics coexist within the same firm (Pache & Santos, 2013; Greenwood et al., 2011). When the firm is under full state ownership, the dominant logic favours political and social objectives (e.g., national security, employment stability) alongside economic goals (Liu et al., 2023). Following partial privatisation, a second actor (private shareholders) enters the scene and introduces a market-oriented logic alongside the first, rather than replacing it (Oliver, 1991). This creates a kind of institutional complexity requiring firms to respond appropriately. Firms that face such institutional complexities may respond strategically by selecting and combining practices from both logics in ways that let them maintain legitimacy with multiple audiences at the same time

(Meyer & Rowan, 1977; Pache & Santos, 2013). ESG engagement represents one of such practices in a complex institutional environment, partly because it is valued by both state regulators (who value social and environmental outcomes) and private investors, who increasingly price ESG into valuation and financing decisions (Agyei-Boapeah et al., 2024).

We treat stakeholder theory, the Resource-Based View (RBV), and legitimacy theory as three complementary mechanisms through which this institutional complexity is converted into ESG outcomes, rather than as three competing explanations. First, stakeholder theory identifies why pressure for ESG engagement arises. With partial privatisation, the presence of new private shareholders broadens the firm's stakeholder base and heightens accountability (Freeman, 1984; Wong et al., 2023a). Second, the RBV identifies how firms act on that pressure by harnessing its resource endowments. Specifically, partial privatization injects additional resources (e.g., capital, managerial expertise, and technology) into the firm that can be deployed toward developing ESG capabilities (Barney, 1991; Liu et al., 2023). Third, legitimacy theory identifies what firms gain from doing so. Firms that develop their ESG capabilities to achieve superior ESG performance enjoy continued acceptance from state and market audiences alike (Suchman, 1995).

Since these three mechanisms operate jointly rather than in isolation, our institutional-complexity framing yields a prediction that the ESG effect of partial privatization should not be uniform across firms but should instead depend on how strongly external institutions and markets reinforce the pressures, resources, and legitimacy concerns that hybrid ownership creates. We summarise our theoretical framing in Fig.1 below and continue to develop our logic into H1, H2 and H3 in the subsections that follow.

Fig. 1 – Theoretical Framework



2.2. Partial privatization and ESG performance

Partial privatisation leads to a reduction in state ownership, which typically shifts a firm's focus from primarily governmental objectives toward a broader set of stakeholder interests (Wong et al., 2023a; Liu et al., 2023). The new non-state (private) shareholders, together with investors, customers, and communities, can pressurise firms to address ESG concerns, partly because investors increasingly factor ESG ratings into capital-allocation decisions (Wang et al., 2023b; Zhang et al., 2025). Firms seeking to maximize long-term value must satisfy these varied stakeholder demands, and ESG engagement is a central tool for achieving this (Mitchell et al., 2010, Zhang & Lai, 2024).

The RBV offers a complementary channel for linking partial privatisation to ESG outcomes. Partial privatization brings new capital, technology, and managerial expertise that firms can deploy toward environmental management systems, green innovation, social programs, and governance structures (Liu et al., 2021; Wan et al., 2023; Zhang & Lai, 2024). For instance, greater financial flexibility under partial privatisation can fund cleaner production technologies that might have been deprioritized under budget-constrained state control (Zhang & Lai, 2024; Liu et al., 2021; Yan et al., 2025). These positive ESG practices and outcomes (e.g. green innovation), backed by financial and managerial resources, can become a source of competitive advantage for attracting environmentally and socially conscious investors and consumers (Zhang et al., 2024; Bashir et al., 2023).

Legitimacy theory adds the final piece. As state ownership falls, these partially privatised firms may face increased scrutiny from regulators, the public, and other stakeholders (Mou et al., 2025), and ESG engagement becomes a way to secure a “social license to operate” and avoid negative publicity (Li et al., 2025; Zhang & Lai, 2024; Yu et al., 2025). Firms may also adopt ESG practices mimetically by way of resembling successful peers or conform to prevailing institutional expectations (Li et al., 2025; Duan et al., 2025).

Taken together, these mechanisms lead us to expect a positive association between partial privatization and ESG performance. Therefore, we formulate H1 as follows:

H1: Partial privatization is positively associated with ESG performance.

2.3. The role of institutional pressure

Contingency theory holds that organizational outcomes depend on the fit between internal governance arrangements and the external environment (Donaldson, 2001). Accordingly, hybrid ownership should translate into better ESG outcomes only where external conditions permit the strategic discretion, resource deployment, and accountability that ESG engagement requires. In China, regional development and product-market competition are two key sources of institutional pressure. Developed regions have stronger regulatory enforcement, more stakeholder awareness, and more sustainability

infrastructure, while competitive markets sharpen reputational concerns and reward ESG differentiation. In less competitive settings, these pressures may simply be too weak to activate the ESG-enhancing potential of partial privatisation (Donaldson, 2001; Filatotchev & Allcock, 2010; Payne et al., 2009).

2.3.1 Regional development

Regional development operates as an informal institutional pressure (Wen, 2025). In more developed regions, firms face stronger regulatory oversight, more public awareness, and more active civil society organizations advocating for environmental and social outcomes (Rauf et al., 2025; Barbero et al., 2024). Stakeholders in these regions, including consumers, investors, and NGOs tend to be more attentive to corporate sustainability (Lee et al., 2024; Li et al., 2025), which pushes even partially privatized firms to prioritize ESG. In less developed regions, this informal pressure is weaker, and the ESG benefits of partial privatization should be correspondingly muted (Usman et al., 2024; Rauf et al., 2025; Barbero et al., 2024). Accordingly, we formulate H2 as follows:

H2: The positive relationship between partial privatization and ESG performance will be more pronounced in firms located in more developed regions.

2.3.2 Market competition

Product-market competition can incentivize ESG improvements because firms differentiate themselves not only on price and quality but on sustainability commitments (Muhmad et al., 2021; Wang et al., 2024). Evidence is mixed on the baseline direction, with Muhmad et al. (2021) finding that competition is associated with lower ESG performance absent strong governance, while Wang et al. (2024) finds that competition amplifies the positive link between ESG disclosure and innovation. This suggests that competition is a conditioning force rather than a uniformly positive one. For partially privatized firms, we expect the strengthening channel to dominate since ESG performance offers a strategic tool for competitive advantage (Li & Li, 2025; Dkhili, 2024), helping

firms attract socially conscious investors, appeal to environmentally aware consumers, and build reputation (Brueninghaus et al., 2025; Agyei-Boapeah et al., 2024; Guo, 2024). This leads us to H3 below:

H3: The positive relationship between partial privatization and ESG performance will be more pronounced in firms facing high market competition.

3. Methodology

3.1. Data and sample

This study examines A-share companies listed on the Shanghai and Shenzhen Stock Exchanges from 2009 to 2022. Our sample starts in 2009, coinciding with the introduction of ESG performance ratings for Chinese-listed companies by the Sino-Securities Index. ESG ratings data are sourced from the Sino-Securities Index, while other data come from the China Stock Market & Accounting Research (CSMAR) database. After excluding financial firms, special-treatment firms, and firms with incomplete data, our final sample comprises 28,796 firm-year observations from 3,294 unique companies.

Since our sample is restricted to already-listed A-share firms, “partial privatization” in this article refers to a reduction in the state’s existing shareholding in a listed firm, not the initial listing or full privatization of a previously wholly state-owned, unlisted enterprise. Our unit of analysis is, therefore, listed firms with a pre-existing state ownership stake that is subsequently reduced, consistent with prior studies using the same definition (Chen et al., 2018; Usman et al., 2024; Rauf et al., 2025).¹

3.2. Variable measurement

We measure firms’ ESG performance (ESG-Performance) using ESG ratings from the Sino-Securities Index, following prior research (e.g., Yang et al., 2024; Chen et al., 2025).

¹In the interest of robustness, we later conduct further analyses involving different specifications of our sample: (i) only firms with government ownership; (ii) firms in which the government is the majority shareholder; and (iii) firms in which the government holds a minority ownership stake. In all specifications, our proxies for partial privatization remain positive and significant (see Section 4.4.3 and Table 9).

The ratings follow a 9-grade system (AAA, AA, A, BBB, BB, B, CCC, CC, C) with corresponding numerical scores (1–9). We use the natural logarithm of these scores for two reasons. First, the log transformation captures the diminishing marginal effect of ESG improvement: moving from a rating of 1 to 2 is a 100% increase, while moving from 8 to 9 is only a 12.5% increase, and the logarithmic function reflects this concavity. Second, ESG scores in our sample are right-skewed, with 92% of firms clustered between 1 and 5; the log transformation compresses the tail and reduces skew, which is preferable for linear estimation (Cameron & Trivedi, 2005). Because the underlying scale is ordinal rather than continuous, we treat the log-transformed measure as the primary specification for interpretability and comparability with prior ESG studies, and we report the non-transformed ordinal scale, estimated via ordered logistic regression, as a robustness check (see Section 4.4).

Consistent with existing studies, we define partial privatization as a reduction in state ownership (for further details, please see Chen et al., 2018; Usman et al., 2024; Rauf et al., 2025). Our proxies for partial privatization are *Privatize_Dum*, a dummy variable indicating a reduction in state ownership (1 = state ownership reduced, 0 = otherwise), and *Privatize_Pro*, the proportion of state ownership reduced. In addition, in our robustness test, we employ a threshold approach (Usman et al., 2024) to define privatization levels, using state ownership caps of 10% and 20%. Specifically, we use two alternative measures of partial privatization: *Privatization_10%*, a dummy variable equaling 1 if a firm has sold 10% or more shares from its state ownership portion (and 0 otherwise); and *Privatization_20%*, a dummy variable equaling 1 if a firm has sold 20% or more shares from its state ownership portion (and 0 otherwise).

The study examines two moderating variables that may influence the relationship between partial privatisation and ESG performance. Regional development (*Development*), a binary variable, equals 1 if a firm is located in developed eastern coastal regions and 0 otherwise (Javed et al., 2023). Market competition (*Competition*) is measured using the Herfindahl-Hirschman Index (HHI), which is calculated as the sum of the squared market shares of firms in an industry; a higher HHI value indicates lower market competition.

To isolate the effect of partial privatization on ESG performance, we follow existing studies and control for a range of firm-level economic and governance characteristics (e.g., Lu et al., 2024; He et al., 2024; Chen et al., 2025; Li et al., 2025; Al-Shaer et al., 2026). We include governance variables because they shape the quality of internal monitoring and a firm’s propensity for ethical risk-taking. Specifically, we control for board size (*B-Size*), board independence (*B-Outside*), and gender diversity (*B-Female*), as prior work shows that well-structured, diverse boards curb managerial opportunism and strengthen oversight of sustainability initiatives (Zalata et al., 2019; Sila et al., 2016). To account for agency costs, we also control for CEO duality (*Duality*) and equity ownership by the CEO (*CEO-Owner*) and board (B-Owner). This ensures that changes in ESG performance are attributable to the shift in ownership structure rather than to entrenched managers’ status-seeking or overconfidence (Chen et al., 2019; Sako & Kubo, 2019; Wang & Xiao, 2024). In addition, we control for institutional ownership (*Institutional-Owner*), which is often associated with long-term green investment strategies, and for residual state ownership (*SOE*) to capture the political or social objectives that continue to differentiate state-linked firms from private counterparts (Tan et al., 2020; Luo & Liu, 2025).

We also control for firm-level economic characteristics that affect ESG capacity and incentives. Firm size (*F-Size*) and age (*F-Age*) proxy for visibility, resource slack, and organizational maturity; larger, older firms face greater public scrutiny and possess more capital to invest in non-financial reporting (Xie et al., 2022; Tan et al., 2020). Financial leverage (*Financial-Leverage*) and firm performance (*Performance-TQ*) are included to capture financing constraints, since highly levered firms may prioritize short-term obligations over long-term environmental projects (Wang & Shao, 2024; Wang & Xiao, 2024). Finally, we control for capital intensity (*Capital Intensive*) to account for industry-specific asset structures and the associated ecological burdens and regulatory requirements (Usman et al., 2024).

Finally, we include year and industry dummies to account for time-specific shocks and unobserved industry-specific heterogeneity that may influence ESG practices. Table 1 presents our variable descriptions in detail.

[PLEASE INSERT TABLE 1 HERE]

3.3. Estimation methodology

To explore the relationship between partial privatization and ESG performance, we estimate equation 1. We estimate equation 1 using multiple regression and compute t -statistics by clustering standard errors by firm and year to ensure robust inferences and account for within-firm and time correlations (Thompson, 2011; Usman et al., 2026).

$$ESG_Performance_{it} = \beta_0 + \beta_1 Privatize_{it} + \sum_{i=1}^n \beta_n Controls_{it} + \varepsilon_{it} \quad (Eq. 1)$$

where *ESG-Performance* refers to the ESG rating, *Privatize* refers to proxies for partial privatization (*Privatize_Dummy* & *Privatize_Proportion*), and *Controls* encompasses all control variables.

4. Results

4.1. Descriptive statistics and correlation analysis

Table 2 presents descriptive statistics, showing that state ownership decreased in 25.1% of firm-year observations, with a mean reduction of 3.80%. The average ESG rating is 4.048, indicating that Chinese firms in our sample generally have a B rating or higher. The ESG rating range (minimum 1, maximum 8) highlights significant variation in ESG performance across these firms, suggesting a need to explore the determinants of this variation. The mean value for *Development* (0.667) indicates that approximately 66.7% of the companies in our sample are located in developed regions of China.

To address potential multicollinearity concerns, we present the correlation matrix in Table 3 (Panel A). The correlation coefficients among all variables remain below 0.70, indicating that multicollinearity is unlikely to affect our multivariate analysis. Additionally, we compute the variance inflation factors (VIFs) for all explanatory variables. As shown in Panel B of Table 3, the VIF values for eleven of the explanatory variables were below 2, while those for the remaining six ranged between 2 and 4. The highest VIF was 3.895, observed for Board Share Ownership. These values are well below the commonly accepted

threshold of 10 (and the more conservative threshold of 5), suggesting that multicollinearity is unlikely to be a concern in our analyses.

[PLEASE INSERT TABLE 2 HERE]

[PLEASE INSERT TABLE 3 HERE]

4.2. Regression analysis

4.2.1 Partial privatization and ESG performance (H1)

Table 4 presents the results on the relationship between partial privatization and ESG performance. The coefficients for both partial privatization proxies are consistently positive and statistically significant (*Privatize_Dummy* = 0.027, $p < 0.01$; *Privatize_Proportion* = 0.038, $p < 0.05$). These findings indicate that partial privatization is associated with a notable improvement in ESG performance, suggesting that reducing state ownership can enhance a firm's commitment to sustainability. By aligning more closely with market and stakeholder expectations, partial privatization appears to drive firms towards better ESG practices and outcomes, ultimately boosting their overall ESG performance.

This is consistent with recent mixed-ownership evidence (Liu et al., 2023) but contrasts with Mou et al. (2025), who find that privatization can hurt ESG performance where a state-owned imprint persists in management practice. A plausible reconciliation is that our sample retains partial (not full) state ownership, on average (mean SOE = 0.388), so residual state linkages may continue to discipline firms even as private shareholders introduce additional ESG pressure, whereas Mou et al. (2025) study settings where the state-owned imprint dominates post-divestment.

[PLEASE INSERT TABLE 4 HERE]

4.2.2 Partial privatization and ESG performance: The Role of Regional Development (H2)

Next, we investigate how regional variations in development influence the relationship between partial privatization and ESG performance. We first conduct a split-sample

analysis, estimating the partial privatization impact on ESG performance separately for firms in more developed versus less developed regions (Table 5, columns 1-4). Results show both partial privatization proxies remain positive and significant for firms in more developed regions, but are insignificant for those in less developed regions. This suggests the positive partial privatization effect on ESG performance is more pronounced for firms in more developed regions. We then analyse the partial privatization-ESG performance nexus with regional development using interaction effects (Table 5, columns 5-6). Both interaction terms are positive and significant ($Privatize_Dummy \times Development = 0.031$, $p < 0.01$; $Privatize_Proportion \times Development = 0.100$, $p < 0.01$).

Overall, these results support our second hypothesis, indicating that regional development strengthens the positive impact of partial privatization on ESG performance. This implies that in more developed regions, the benefits of partial privatization on ESG are amplified, likely because firms here face stronger institutional pressures, greater stakeholder scrutiny, and better resources to invest in ESG initiatives, thereby, enhancing the effectiveness of privatization in driving ESG improvements.

[PLEASE INSERT TABLE 5 HERE]

4.2.3 Partial privatization and ESG performance: The Role of Market Competition (H3)

Finally, we examine how product market competition moderates the relationship between partial privatization and ESG performance. Using a split-sample analysis, we estimate the impact of partial privatization on ESG performance separately for firms facing high market competition (HH_Index below sample mean) and those facing low market competition (HH_Index above sample mean), as presented in Columns 1-4 of Table 6. The results show that both proxies of partial privatization remain positive and significant for firms facing high market competition, whereas they remain insignificant for firms facing low market competition. These findings suggest that the positive effect of partial privatization on ESG performance is more pronounced for firms operating in competitive markets. Further analysis using interaction effects, reported in Columns 5 and 6 of Table 6, reveals that both interaction terms are positive and statistically significant

(*Privatize_Dummy*×*Competition* = 0.026, $p<0.01$; *Privatize_Proportion*×*Competition* = 0.090, $p<0.05$).

Overall, these results provide robust support for our third hypothesis, indicating that market competition strengthens the positive impact of partial privatization on ESG performance. A plausible explanation is that firms facing intense competition are more incentivized to bolster ESG credentials after partial privatization, in order to attract eco-conscious investors, meet stakeholder demands, and build sustainable competitive advantage, consistent with Li & Li (2025) and Dkhili (2024).

[PLEASE INSERT TABLE 1 HERE]

4.3. Additional test (Partial privatization, ESG performance, and firm value)

A remaining question is whether ESG improvement linked to partial privatization translates into shareholder value. Table 7 reports results with future firm performance (*Future_Performance-TQ*) as the dependent variable. Both interaction coefficients are positive and significant (*Privatize_Dummy*×*ESG_Performance* = 0.166, $p<0.01$; *Privatize_Proportion*×*ESG_Performance* = 0.396, $p<0.05$), indicating that ESG improvement stemming from partial privatization is associated with higher future firm performance, consistent with the view that ESG engagement builds stakeholder trust, reduces operational risk, and supports growth (Eccles et al., 2014; Friede et al., 2015).

[PLEASE INSERT TABLE 7 HERE]

4.4. Robustness test

To ensure the robustness of our findings, we conduct a series of sensitivity analyses employing alternative measures of both dependent and independent variables.

4.4.1 Alternative measure of ESG performance

Firstly, we re-examine the relationship between partial privatization and ESG performance using an alternative ESG performance metric. Specifically, we utilize the raw ESG ratings, ranging from 1 to 9, provided by the Sino-Securities Index, rather than the

log-transformed values employed in our primary analysis. Given the ordinal nature of this variable, we estimate ordered logistic regression models and report the results in Columns 1 and 2 of Table 8. These results are consistent with our existing findings, indicating that partial privatization significantly enhances ESG performance.

4.4.2 Alternative measure of partial privatization

Secondly, we adopt a threshold approach (Usman et al., 2024) to redefine partial privatization, leveraging reductions in state ownership thresholds of 10% and 20%. We construct two alternative measures of partial privatization: *Privatization_10%*, a dummy variable equalling 1 if a firm's state ownership has been reduced by at least 10 percentage points (and 0 otherwise); and *Privatization_20%*, a dummy variable equalling 1 if a firm's state ownership has been reduced by at least 20 percentage points (and 0 otherwise). The results, presented in Columns 3 and 4 of Table 8, are consistent with our primary findings, indicating that partial privatization leads to significant improvements in ESG performance.

[PLEASE INSERT TABLE 8 HERE]

4.4.3 Alternative samples

Finally, to assess the robustness of our findings to the sample composition underlying our definition of partial privatization, we re-estimate the baseline model using three alternative subsamples. First, we restrict the analysis to firms with government ownership, thereby excluding fully private firms (Columns 1–2 of Table 9). Second, we focus on firms in which the government is the majority shareholder (Columns 3–4). Third, we estimate the model for firms in which the government holds a minority ownership stake (Columns 5–6). Across all three subsamples, the results remain qualitatively unchanged and continue to show that partial privatization is positively and significantly associated with ESG performance. These findings provide further evidence that our main results are not driven by the composition of the full sample or by our definition of partial privatization.

[PLEASE INSERT TABLE 9 HERE]

4.5. Controlling for endogeneity

Our results may be affected by endogeneity concerns, including reverse causality, omitted variable bias, self-selection, and sensitivity to unobservable variables. To address these issues, we employ a one-year lag model, firm fixed effects regression, propensity score matching, and Oster delta sensitivity analysis (Javed et al., 2023; Wang et al., 2024; Usman et al., 2025; Niu et al., 2025; Usman et al., 2026a,b).

4.5.1 Reverse causality

To address potential biases stemming from reverse causality and account for the likely delayed impact of partial privatization on ESG performance, we adopt a methodological approach consistent with the spirit of recent studies (Wang et al., 2024; Niu et al., 2025). Specifically, we apply a one-year lag to both the independent variable (partial privatization) and the control variables, thereby better capturing the temporal dynamics of this relationship. The results of this lagged regression model are presented in Columns 1 and 2 of Table 10. As shown, our core findings remain robust, indicating that partial privatization has a significant positive effect on ESG performance even after accounting for temporal lags.

Furthermore, we employ the difference-in-differences (DID) approach to mitigate concerns about reverse causality. Following Huang and Kisgen (2013) and Alkebsee et al. (2021), we identify firms that experienced partial privatization and restrict the sample to firm-years within five years before and after the event (excluding the event year), which increases the number of usable privatization events while limiting serial-correlation bias in DID designs (Bertrand, Duflo, & Mullainathan, 2004). We define *Post* as equal to 1 for firm-years following partial privatization. The coefficient on *Privatize-Proportion* × *Post* (Table 10, column 3)² is positive and significant at the 5% level, reinforcing that partial privatization raises ESG performance in the post-event period rather than merely proxying for pre-existing firm quality.

²In this analysis, we restrict the sample to only firms that experienced partial privatisation, so we could not run regressions using our *Privatize_Dummy* proxy. Accordingly, we only rely on *Privatize_Proportion* for this estimation.

4.5.2 Omitted variable bias

To address omitted-variable bias arising from time-invariant firm-specific characteristics, such as organizational culture or management style, that could confound our estimates, we employ firm-fixed-effects regression models (Javed et al., 2023). By controlling for these unobserved firm-specific factors, we can mitigate omitted-variable bias and obtain more precise and reliable estimates of the relationship between partial privatization and ESG performance (Javed et al., 2023). The results of these firm-fixed effects regressions, presented in Columns 4 and 5 of Table 10, are consistent with our earlier findings and reinforce the notion that partial privatization leads to significant improvements in ESG performance.

4.5.3 Self-selection bias

To overcome the issue of self-selection bias, which may arise if firms with certain characteristics are more likely to undergo partial privatization and simultaneously exhibit better ESG performance, we adopt a Propensity Score Matching (PSM) approach, following the methodologies of recent studies (Niu et al., 2025; Usman et al., 2024). By employing PSM, we aim to mitigate the impact of observable differences in firm characteristics that may influence ESG performance, effectively creating a matched control group of firms that are similar in all respects except for the treatment (partial privatization). This allows us to more accurately isolate the treatment effect and reduce self-selection bias.

To do so, we estimate a probit regression model to predict the likelihood of partial privatization based on the study's control variables (first-stage results reported in Column 4 of Table 11). We then employ a nearest-neighbor matching approach with a 1% caliper to match each partially privatized firm with a control firm that exhibits similar characteristics. This process yields a matched sample of 1,4452 firm-year observations.

The univariate analysis of the PSM-matched sample, presented in Columns 1-3 of Table 10, indicates that firms with and without partial privatization are well matched on observable characteristics, suggesting effective balancing of the treatment and control

groups. We then re-estimate our primary model (Equation 1) using this matched sample, and we find results (Columns 5 and 6 of Table 11) consistent with our earlier findings.

[PLEASE INSERT TABLE 10 HERE]

[PLEASE INSERT TABLE 11 HERE]

4.5.4 Unobservable variables sensitivity

To further assess the robustness of our results to unobserved confounding factors, we apply Oster's (2019) method, following Usman et al. (2025). This approach evaluates the sensitivity of our findings to omitted-variable bias, indicating how strong an omitted variable would need to be to explain away the observed effect, relative to the observed covariates.

The Oster delta values for *Privatize_Dummy* and *Privatize_Proportion* are 3.66 and 3.86, respectively, both exceeding the threshold of 1 (Oster, 2019), suggesting that our findings are robust to omitted-variable bias. This implies that unobserved factors are unlikely to reverse the positive association between partial privatization and ESG performance, lending further support to the reliability of our results.

5. Discussion

This study provides evidence that partial privatization is positively associated with ESG performance in Chinese firms, and that this relationship is conditional on institutional pressure from regional development and market competition. These findings extend prior research on ownership structure and sustainability by showing that hybrid ownership can outperform both purely state-owned and fully private firms in responding to ESG demands, at least where institutional and competitive pressures are strong enough to activate that response.

First, the positive partial privatization–ESG association supports the view that hybrid ownership combines the strengths of state and market logics: state ownership offers policy alignment and long-term orientation, while private ownership introduces efficiency,

managerial discipline, and accountability (Megginson & Netter, 2001; Bruton et al., 2015). This is consistent with stakeholder theory's prediction that partial privatization broadens firms' stakeholder exposure and increases responsiveness to environmental and social expectations (Freeman, 1984). Partially privatized firms face stronger scrutiny from investors and analysts than fully state-owned peers, which makes ESG engagement both strategically valuable and reputationally necessary.

Second, from the RBV, partial privatization appears to enhance access to ESG-relevant resources such as managerial expertise, technology, governance know-how (Barney, 1991). This is consistent with evidence that private shareholders push for professionalized, performance-oriented governance (Gupta, 2005; Estrin & Pelletier, 2018). Our results suggest that these resource gains translate into more effective ESG implementation in environments that require organizational learning and sustained investment.

Third, the strengthening role of regional development highlights the importance of institutional infrastructure for activating the ESG benefits of partial privatization. In more developed regions, stronger regulatory enforcement and higher stakeholder awareness intensify legitimacy pressure and reduce symbolic ESG adoption (Marquis & Qian, 2014; Li et al., 2020). Weaker institutional environments appear to limit how far partial privatization translates into substantive sustainability improvement. This is consistent with the contingency logic of Donaldson (2001) and with the institutional-complexity framing (Greenwood et al., 2011; Pache & Santos, 2013) we adopted in Section 2, i.e., hybrid ownership only pays off where external institutions reinforce it.

Fourth, the moderating effect of market competition supports institutional and contingency-based arguments that competitive pressure disciplines firms and encourages ESG differentiation (Porter & van der Linde, 1995; Aghion et al., 2016). In highly competitive markets, ESG performance functions as a signal of quality and long-term orientation; market discipline appears to complement state oversight, reducing managerial slack while strengthening incentives for responsible behavior.

Finally, the positive association between ESG performance and future firm value reinforces the economic relevance of sustainability in emerging markets, consistent with evidence that ESG investment reduces risk and strengthens long-term competitiveness

(Eccles et al., 2014; Friede et al., 2015). Our findings suggest that partial privatization does not merely improve ESG symbolically but contributes to financially meaningful sustainability performance, which is in line with the broader survey evidence on ESG and investor behavior (Rau & Yu, 2024).

6. Implications and conclusion

This study advances understanding of ESG governance by showing that partial privatization is a distinct and consequential ownership arrangement for sustainability outcomes. Using a large panel of Chinese listed firms from 2009 to 2022, we show that partial privatization is positively associated with ESG performance, and that institutional pressure from regional development and market competition amplifies this relationship. Improved ESG performance is, in turn, linked to higher future firm value, underscoring the strategic and economic significance of sustainability.

Theoretically, the study moves beyond the binary state-versus-private distinction and conceptualizes partial privatization as a hybrid governance mechanism grounded primarily in institutional theory (Meyer & Rowan, 1977; Oliver, 1991; Pache & Santos, 2013), with stakeholder theory, the RBV, and legitimacy theory operating as complementary mechanisms rather than competing explanations. This integration shows how hybrid ownership reshapes accountability, resource endowments, and legitimacy pressures in ways that promote ESG engagement, and it reinforces the contingency-based argument that governance mechanisms are context-dependent rather than universally effective.

Practically, the results carry specific implications for three audiences. For policymakers designing mixed-ownership reform, the findings suggest that partial privatization is not a substitute for institutional development: reform programs are more likely to deliver ESG gains when sequenced alongside investment in regional regulatory capacity, rather than rolled out uniformly across regions of very different institutional strength. For regulators, strengthening product-market competition can itself raise the ESG returns to ownership reform, since our results show competition and privatization working together rather than independently. For investors, our findings suggest that partially privatized firms located in developed, competitive regions are more likely to deliver genuine (rather than symbolic)

ESG improvement, which is a more specific screening criterion than “partially state-owned” alone, and one that is further supported by the link we document between ESG gains and future firm value (World Economic Forum, 2023).

The study has limitations that open avenues for future research. Future work could examine the micro-level mechanisms through which partial privatization influences ESG outcomes (e.g., managerial incentives, board dynamics, or stakeholder engagement processes) and comparative analyses across countries and institutional systems would help establish how far our findings generalize beyond China. Overall, this study underscores that ownership reform and sustainability are closely interconnected, and that partial privatization, appropriately supported by institutional development, can play a meaningful role in advancing ESG performance in emerging economies.

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Table 1: Variables measurement.

Variables	Description
ESG-Performance	ESG ratings from the Sino-Securities Index (range from 1-9)
Privatize-Dum	A dummy variable indicating a decrease in state ownership (1 = state-ownership reduction, 0 = otherwise)
Privatize-Proportion	The proportion of state ownership reduction.
B-Size	Number of directors on the board.
B-Outside	Proportion of outside directors on the board.
B-Female	Proportion of female directors on the board.
Duality	Equals 1 if the CEO is also chairperson of the board and 0 otherwise.
CEO-Owner	Proportion of shares owned by the CEO.
B-Owner	Proportion of shares owned by the board of directors.
Institutional-Owner	Proportion of shares owned by the institutions.
SOE	Equals 1 if the government is the ultimate owner and 0 otherwise
Development	Equals 1 if the firm is located in developed regions of China (i.e., eastern coastal side) and 0 otherwise
Competition	Measured through the Herfindahl-Hirschman Index (The sum of the squared market shares of all firms in the industry).
Performance-TQ	A ratio of market to book value of assets
F-Size-Assets	Log of total assets.
Capital-Intensive	A ratio of total assets to total revenue.
F-Age-Listing	log of years since stock exchange listing.
Financial-Leverage	A ratio of total debt to total assets.

Source: Authors' compilation.

Table 2: Descriptive statistics

	Mean	Standard Deviation	Minimum	p25	Median	p75	Maximum
ESG-Performance	4.048	1.083	1.000	3.000	4.000	5.000	8.000
Privatize-Dum	0.251	0.434	0.000	0.000	0.000	1.000	1.000
Privatize-Proportion	0.038	0.122	0.000	0.000	0.000	0.000	0.994
B-Size	8.577	1.702	4.000	7.000	9.000	9.000	18.000
B-Outside	0.374	0.054	0.167	0.333	0.333	0.429	0.800
B-Female	0.149	0.131	0.000	0.000	0.111	0.222	0.800
Duality	0.263	0.440	0.000	0.000	0.000	1.000	1.000
CEO-Owner	0.046	0.107	0.000	0.000	0.000	0.015	0.707
B-Owner	0.117	0.185	0.000	0.000	0.002	0.197	0.897
Institutional-Owner	0.444	0.243	0.004	0.255	0.458	0.635	0.930
SOE	0.388	0.487	0.000	0.000	0.000	1.000	1.000
Development	0.667	0.471	0.000	0.000	1.000	1.000	1.000
Competition	0.136	0.143	0.021	0.054	0.089	0.153	0.877
Performance-TQ	2.080	1.360	0.849	1.250	1.648	2.373	8.938
F-Size-Assets	22.193	1.301	18.886	21.278	22.028	22.942	27.028
Capital-Intensive	2.657	2.687	0.390	1.323	1.933	2.948	21.677
F-Age-Listing	2.118	0.895	0.000	1.609	2.303	2.833	3.296
Financial-Leverage	0.435	0.197	0.112	0.272	0.432	0.590	0.783

Source: Authors' compilation.

Table 3: Multicollinearity analyses

Panel A: Correlation analysis																		
Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.ESG-Performance	1																	
2.Privatize-Dum	0.063*	1																
3.Privatize-Proportion	0.002	0.540*	1															
4.B-Size	0.050*	0.138*	0	1														
5.B-Outside	0.047*	-0.042*	-0.005	-0.476*	1													
6.B-Female	-0.024*	-0.069*	0.013*	-0.104*	0.038*	1												
7.Duality	-0.028*	-0.103*	0.014*	-0.187*	0.126*	0.112*	1											
8.CEO-Owner	0.050*	-0.130*	-0.003	-0.172*	0.110*	0.107*	0.519*	1										
9.B-Owner	0.081*	-0.202*	-0.025*	-0.209*	0.095*	0.116*	0.253*	0.697*	1									
10.Institutional-Owner	0.081*	0.209*	0.018*	0.251*	-0.093*	-0.125*	-0.217*	-0.441*	-0.625*	1								
11.SOE	0.072*	0.267*	-0.090*	0.297*	-0.094*	-0.174*	-0.305*	-0.328*	-0.476*	0.422*	1							
12.Development	0.076*	-0.074*	-0.014*	-0.091*	0.016*	0.048*	0.101*	0.121*	0.149*	-0.088*	-0.176*	1						
13.Competition	-0.065*	0.026*	0.003	0.035*	-0.005	-0.020*	-0.037*	-0.045*	-0.054*	0.077*	0.050*	0.001	1					
14.Performance-TQ	-0.115*	-0.022*	0.027*	-0.126*	0.048*	0.038*	0.064*	0.027*	0.013*	-0.031*	-0.142*	0.005	-0.01	1				
15.F-Size-Assets	0.203*	0.195*	0.047*	0.261*	-0.017*	-0.099*	-0.158*	-0.213*	-0.295*	0.405*	0.313*	-0.022*	0.061*	-0.431*	1			
16.Capital Intens	-0.053*	-0.003	0.001	-0.014*	0.012*	0.023*	-0.025*	-0.046*	-0.069*	0.003	0.016*	-0.026*	0.103*	0.002	0.047*	1		
17.F-Age-Listing	-0.081*	0.185*	0.053*	0.147*	-0.040*	-0.065*	-0.236*	-0.404*	-0.581*	0.231*	0.418*	-0.142*	0.031*	-0.041*	0.396*	0.113*	1	
18.Financial-Leverage	-0.083*	0.118*	0.015*	0.163*	-0.029*	-0.081*	-0.135*	-0.219*	-0.316*	0.210*	0.286*	-0.097*	0.041*	-0.260*	0.465*	-0.022*	0.351*	1

Source: Authors' compilation. **Note:** *, indicate significance at 5% level. For variable descriptions, see Table 1.

Panel B: VIF analysis

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
VIF	-	1.120	1.030	1.574	1.352	1.095	1.560	2.639	3.895	2.363	1.752	1.141	2.130	1.595	2.447	1.376	2.205	1.617
1/VIF	-	0.892	0.968	0.635	0.740	0.913	0.641	0.379	0.257	0.423	0.571	0.876	0.470	0.627	0.409	0.727	0.453	0.618

Table 4: Partial privatization and ESG performance (H1).

	Partial privatization and ESG performance (H1).	
	<i>DV = ESG-Performance</i>	
	Column 1	Column 2
Privatize-Dummy	0.027*** (6.61)	
Privatize-Proportion		0.038** (2.49)
B-Size	0.004*** (3.34)	0.004*** (3.53)
B-Outside	0.377*** (10.09)	0.378*** (10.11)
B-Female	-0.004 (-0.29)	-0.005 (-0.36)
Duality	-0.018*** (-3.28)	-0.018*** (-3.32)
CEO-Owner	0.012 (0.49)	0.014 (0.57)
B-Owner	0.207*** (11.49)	0.206*** (11.41)
Institutional-Owner	0.035*** (3.10)	0.038*** (3.32)
SOE	0.078*** (15.68)	0.084*** (16.70)
Development	0.024*** (5.84)	0.023*** (5.75)
Competition	-0.100*** (-5.61)	-0.100*** (-5.61)
Performance-TQ	0.002 (0.98)	0.002 (1.15)
F-Size-Assets	0.093*** (43.24)	0.093*** (43.67)
Capital-Intensity	-0.011*** (-12.23)	-0.011*** (-12.31)
F-Age-Listing	-0.045*** (-15.47)	-0.045*** (-15.40)
Financial-Leverage	-0.407*** (-31.95)	-0.407*** (-31.98)
Constant	-0.618*** (-13.14)	-0.635*** (-13.52)
<i>N</i>	28796	28796
<i>R</i> ²	0.18	0.18
Year-fixed effects	Yes	Yes
Industry-fixed effects	Yes	Yes
Error cluster (Dual)	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 5: Partial privatization, ESG performance, and regional development nexus (H2).

	Partial privatization and ESG performance: Role of regional development (H2).					
	Split sample analysis				Interaction effect analysis	
	More-developed regions		Less-developed region		Whole sample	
	sample		sample			
	<i>DV = ESG-Performance</i>					
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Privatize-Dummy	0.036*** (7.33)		0.012 (1.62)		0.008 (1.15)	
Privatize-Proportion		0.071*** (4.19)		-0.026 (-0.86)		-0.028 (-0.90)
Privatize-Dummy×Development					0.031*** (3.69)	
Privatize-Proportion×Development						0.100*** (2.86)
B-Size	0.003* (1.76)	0.003* (1.87)	0.005** (2.50)	0.005*** (2.61)	0.004*** (3.43)	0.004*** (3.55)
B-Outside	0.320*** (6.72)	0.318*** (6.68)	0.465*** (7.66)	0.467*** (7.70)	0.381*** (10.20)	0.379*** (10.14)
B-Female	-0.036** (-2.17)	-0.037** (-2.19)	0.062** (2.24)	0.060** (2.16)	-0.006 (-0.40)	-0.006 (-0.42)
Duality	-0.011* (-1.84)	-0.012* (-1.89)	-0.033*** (-3.20)	-0.033*** (-3.22)	-0.017*** (-3.26)	-0.018*** (-3.33)
CEO-Owner	-0.027 (-0.96)	-0.024 (-0.89)	0.165*** (3.14)	0.168*** (3.20)	0.012 (0.50)	0.014 (0.58)
B-Owner	0.272*** (13.05)	0.271*** (13.02)	0.047 (1.28)	0.044 (1.21)	0.207*** (11.50)	0.206*** (11.43)
Institutional-Owner	0.084*** (6.22)	0.087*** (6.46)	-0.064*** (-3.04)	-0.062*** (-2.95)	0.035*** (3.10)	0.038*** (3.37)
SOE	0.076*** (12.57)	0.084*** (13.73)	0.077*** (8.66)	0.078*** (8.69)	0.078*** (15.71)	0.083*** (16.64)
Development					0.015*** (3.22)	0.019*** (4.54)
Competition	-0.102*** (-4.88)	-0.102*** (-4.90)	-0.117*** (-3.39)	-0.117*** (-3.38)	-0.100*** (-5.64)	-0.100*** (-5.62)
Performance-TQ	-0.000 (-0.03)	0.000 (0.13)	0.003 (1.11)	0.004 (1.16)	0.002 (0.94)	0.002 (1.12)
F-Size-Assets	0.088*** (34.62)	0.089*** (35.07)	0.098*** (24.36)	0.098*** (24.48)	0.092*** (43.09)	0.093*** (43.63)
Capital-Intensity	-0.011*** (-9.64)	-0.011*** (-9.72)	-0.012*** (-7.65)	-0.012*** (-7.69)	-0.011*** (-12.23)	-0.011*** (-12.32)
F-Age-Listing	-0.036*** (-10.67)	-0.036*** (-10.62)	-0.062*** (-10.88)	-0.061*** (-10.81)	-0.045*** (-15.52)	-0.044*** (-15.38)
Financial-Leverage	-0.405*** (-26.07)	-0.406*** (-26.09)	-0.415*** (-18.34)	-0.416*** (-18.37)	-0.406*** (-31.93)	-0.407*** (-31.99)
Constant	-0.509*** (-8.73)	-0.528*** (-9.08)	-0.674*** (-7.99)	-0.683*** (-8.11)	-0.609*** (-12.94)	-0.631*** (-13.44)
<i>N</i>	19218	19218	9578	9578	28796	28796
<i>R</i> ²	0.19	0.19	0.18	0.18	0.18	0.18
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Error cluster (Dual)	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 6: Partial privatization, ESG performance, and market competition (H3).

	Partial privatization and ESG performance: Role of market competition (H3)					
	Split sample analysis				Interaction effect analysis	
	High market competition		Low market competition		Whole sample	
	sample		sample			
	<i>DV = ESG-Performance</i>					
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Privatize-Dummy	0.032*** (6.95)		0.013 (1.57)		0.009 (1.09)	
Privatize-Proportion		0.063*** (3.72)		-0.027 (-0.81)		-0.027 (-0.81)
Privatize-Dummy×High-Competition					0.026*** (2.81)	
Privatize-Proportion×High-Competition						0.090** (2.44)
B-Size	0.005*** (3.58)	0.006*** (3.70)	0.002 (0.70)	0.002 (0.82)	0.004*** (3.39)	0.004*** (3.50)
B-Outside	0.364*** (8.21)	0.364*** (8.21)	0.415*** (6.00)	0.414*** (6.00)	0.378*** (10.13)	0.377*** (10.10)
B-Female	-0.009 (-0.57)	-0.011 (-0.65)	0.025 (0.86)	0.025 (0.85)	-0.004 (-0.29)	-0.005 (-0.36)
Duality	-0.013** (-2.13)	-0.013** (-2.17)	-0.028** (-2.48)	-0.027** (-2.46)	-0.018*** (-3.28)	-0.018*** (-3.31)
CEO-Owner	0.008 (0.30)	0.010 (0.37)	0.002 (0.04)	0.003 (0.06)	0.012 (0.49)	0.013 (0.55)
B-Owner	0.215*** (10.41)	0.214*** (10.33)	0.200*** (5.51)	0.200*** (5.50)	0.208*** (11.51)	0.206*** (11.42)
Institutional-Owner	0.064*** (4.89)	0.066*** (5.08)	-0.025 (-1.09)	-0.023 (-1.01)	0.035*** (3.11)	0.037*** (3.30)
SOE	0.070*** (12.79)	0.077*** (13.96)	0.097*** (9.10)	0.098*** (9.24)	0.078*** (15.72)	0.084*** (16.71)
Development	0.014*** (2.99)	0.013*** (2.93)	0.054*** (6.63)	0.054*** (6.60)	0.023*** (5.81)	0.023*** (5.74)
Competition					0.022*** (3.03)	0.026*** (3.85)
Performance-TQ	-0.002 (-1.18)	-0.002 (-1.03)	0.011*** (3.33)	0.011*** (3.40)	0.002 (0.95)	0.002 (1.13)
F-Size-Assets	0.090*** (36.73)	0.091*** (37.08)	0.098*** (23.12)	0.098*** (23.33)	0.093*** (43.21)	0.093*** (43.62)
Capital-Intensity	-0.011*** (-11.32)	-0.012*** (-11.43)	-0.009*** (-5.05)	-0.009*** (-5.06)	-0.011*** (-12.29)	-0.011*** (-12.39)
F-Age-Listing	-0.041*** (-12.48)	-0.041*** (-12.45)	-0.055*** (-9.42)	-0.055*** (-9.33)	-0.045*** (-15.49)	-0.044*** (-15.39)
Financial-Leverage	-0.417*** (-28.32)	-0.418*** (-28.35)	-0.372*** (-14.98)	-0.373*** (-14.99)	-0.407*** (-31.94)	-0.407*** (-31.96)
Constant	-0.762*** (-7.97)	-0.785*** (-8.22)	-0.743*** (-8.66)	-0.755*** (-8.83)	-0.649*** (-13.85)	-0.665*** (-14.21)
<i>N</i>	20498	20498	8298	8298	28796	28796
<i>R</i> ²	0.19	0.19	0.19	0.19	0.18	0.18
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Error cluster (Dual)	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 7: Partial privatization, ESG performance, and future firm performance nexus (Additional test).

	Partial privatization, ESG performance, and future firm performance nexus	
	<i>DV = Future-Performance-TQ</i>	
	Column 1	Column 2
Privatize-Dummy×ESG-Performance	0.166*** (2.73)	
Privatize-Proportion×ESG-Performance		0.392** (2.09)
ESG-Performance	-0.053* (-1.88)	-0.029 (-1.12)
Privatize-Dummy	-0.169* (-1.92)	
Privatize-Proportion		-0.495* (-1.87)
B-Size	0.003 (0.69)	0.004 (0.82)
B-Outside	0.940*** (6.37)	0.954*** (6.46)
B-Female	-0.069 (-1.15)	-0.069 (-1.15)
Duality	0.051** (2.34)	0.050** (2.30)
CEO-Owner	0.103 (0.98)	0.109 (1.04)
B-Owner	0.064 (0.86)	0.058 (0.78)
Institutional-Owner	1.197*** (25.46)	1.205*** (25.55)
SOE	-0.244*** (-12.24)	-0.234*** (-11.66)
Development	-0.070** (-2.31)	-0.070** (-2.30)
Competition	0.123 (1.33)	0.122 (1.33)
F-Size-Assets	-0.524*** (-45.30)	-0.521*** (-45.12)
Capital-Intensity	0.009** (2.18)	0.009** (2.14)
F-Age-Listing	0.203*** (15.86)	0.205*** (15.94)
Financial-Leverage	-0.394*** (-7.18)	-0.397*** (-7.23)
Constant	12.926*** (56.18)	12.839*** (56.26)
<i>N</i>	23847	23847
<i>R</i> ²	0.36	0.36
Year-fixed effects	Yes	Yes
Industry-fixed effects	Yes	Yes
Error cluster (Dual)	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 8: Partial privatization and ESG performance (Using alternative measures).

	Partial privatization and ESG performance (Using alternative measures)			
	ESG-Rating (Ordinal regression)		ESG-Performance	
	Column 1	Column 2	Column 3	Column 4
Privatize-Dummy	0.177*** (6.56)			
Privatize-Proportion		0.201** (2.08)		
Privatize-10%			0.019*** (3.13)	
Privatize-20%				0.016** (2.06)
B-Size	0.030*** (3.65)	0.031*** (3.82)	0.004*** (3.52)	0.004*** (3.54)
B-Outside	3.136*** (12.87)	3.140*** (12.91)	0.378*** (10.12)	0.378*** (10.11)
B-Female	-0.035 (-0.39)	-0.038 (-0.43)	-0.005 (-0.35)	-0.005 (-0.35)
Duality	-0.103*** (-3.28)	-0.105*** (-3.35)	-0.018*** (-3.32)	-0.018*** (-3.32)
CEO-Owner	-0.044 (-0.28)	-0.029 (-0.18)	0.014 (0.57)	0.014 (0.58)
B-Owner	1.276*** (11.04)	1.267*** (10.97)	0.207*** (11.44)	0.206*** (11.40)
Institutional-Owner	0.151** (2.15)	0.168** (2.40)	0.038*** (3.33)	0.038*** (3.34)
SOE	0.482*** (16.02)	0.517*** (17.19)	0.084*** (16.74)	0.084*** (16.58)
Development	0.189*** (7.59)	0.187*** (7.49)	0.023*** (5.76)	0.023*** (5.72)
Competition	-0.740*** (-6.85)	-0.736*** (-6.84)	-0.099*** (-5.59)	-0.099*** (-5.59)
Performance-TQ	0.041*** (4.10)	0.043*** (4.30)	0.002 (1.14)	0.002 (1.17)
F-Size-Assets	0.657*** (46.65)	0.662*** (47.12)	0.093*** (43.65)	0.093*** (43.71)
Capital-Intensity	-0.063*** (-12.97)	-0.063*** (-13.06)	-0.011*** (-12.30)	-0.011*** (-12.32)
F-Age-Listing	-0.292*** (-16.28)	-0.290*** (-16.17)	-0.045*** (-15.40)	-0.044*** (-15.35)
Financial-Leverage	-2.431*** (-33.31)	-2.434*** (-33.35)	-0.407*** (-31.98)	-0.407*** (-31.97)
Constant			-0.635*** (-13.51)	-0.637*** (-13.55)
<i>N</i>	28796	28796	28796	28796
<i>R</i> ² / <i>Pseudo R</i> ²	0.08	0.08	0.18	0.18
Year-fixed effects	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes
Error cluster (Dual)	Yes	Yes	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 9: Partial privatization and ESG performance (Using subsample analysis).

	Partial privatization and ESG performance: Subsample analysis					
	Sample firms with state-ownership (excludes firms with no state ownership)		Sample firms with state-ownership where the state is the majority shareholder		Sample firms with state-ownership where the state is a minority shareholder	
	DV = ESG-Performance					
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Privatize-Dummy	0.029*** (6.82)		0.020*** (3.71)		0.039*** (5.99)	
Privatize-Proportion		0.001*** (2.64)		0.006** (1.98)		0.001*** (3.07)
B-Size	0.003** (2.14)	0.003** (2.33)	0.002 (1.51)	0.002 (1.56)	0.004* (1.80)	0.005** (1.96)
B-Outside	0.374*** (9.71)	0.376*** (9.73)	0.404*** (7.64)	0.405*** (7.65)	0.374*** (6.34)	0.374*** (6.33)
B-Female	-0.001 (-0.10)	-0.003 (-0.18)	0.023 (0.95)	0.022 (0.93)	-0.017 (-0.89)	-0.019 (-0.97)
Duality	-0.024*** (-4.17)	-0.024*** (-4.20)	-0.032*** (-3.18)	-0.032*** (-3.20)	-0.022*** (-3.21)	-0.022*** (-3.21)
CEO-Owner	0.016 (0.57)	0.018 (0.64)	-0.726*** (-2.77)	-0.727*** (-2.77)	0.016 (0.55)	0.019 (0.62)
B-Owner	0.196*** (9.92)	0.194*** (9.82)	0.081 (0.60)	0.071 (0.52)	0.184*** (8.37)	0.183*** (8.32)
Institutional-Owner	0.025** (2.11)	0.028** (2.33)	-0.008 (-0.44)	-0.006 (-0.29)	0.028* (1.84)	0.031** (2.03)
SOE	0.071*** (14.22)	0.077*** (15.24)				
Development	0.027*** (6.46)	0.026*** (6.36)	0.037*** (6.41)	0.037*** (6.39)	0.016*** (2.61)	0.015** (2.57)
Competition	-0.122*** (-7.11)	-0.122*** (-7.10)	-0.162*** (-6.93)	-0.161*** (-6.89)	-0.083*** (-3.16)	-0.084*** (-3.18)
Performance-TQ	0.001 (0.60)	0.001 (0.82)	-0.003 (-0.98)	-0.002 (-0.89)	0.006** (2.43)	0.006*** (2.59)
F-Size-Assets	0.092*** (41.87)	0.093*** (42.26)	0.086*** (29.16)	0.087*** (29.36)	0.102*** (30.25)	0.103*** (30.43)
Capital-Intensity	-0.010*** (-11.78)	-0.011*** (-11.85)	-0.010*** (-8.01)	-0.010*** (-8.07)	-0.010*** (-8.13)	-0.010*** (-8.16)
F-Age-Listing	-0.041*** (-12.85)	-0.041*** (-12.87)	-0.022*** (-4.29)	-0.023*** (-4.39)	-0.054*** (-13.20)	-0.054*** (-13.06)
Financial-Leverage	-0.406*** (-30.85)	-0.407*** (-30.89)	-0.392*** (-20.56)	-0.393*** (-20.61)	-0.416*** (-22.71)	-0.417*** (-22.72)
Constant	-0.598*** (-12.49)	-0.615*** (-12.85)	-0.455*** (-7.40)	-0.462*** (-7.51)	-0.750*** (-9.51)	-0.767*** (-9.72)
N	26267	26267	11150	11150	15117	15117
R ²	0.18	0.18	0.20	0.20	0.17	0.17
Year-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Error cluster (Dual)	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 10: Partial privatization and ESG performance (Controlling endogeneity through a one-year lag model, DID, and firm-fixed effects regression)

	Partial privatization and ESG performance: Controlling for endogeneity through a one-year lag model, DID, and firm-fixed effects regression				
	One-year lag		DID	Firm-fixed effects	
	<i>DV = ESG-Performance</i>				
	Column 1	Column 2	Column 3	Column 4	Column 5
Privatize-Dummy	0.019*** (4.08)			0.019*** (4.74)	
Privatize-Proportion		0.030* (1.75)			0.034** (2.57)
Privatize-Proportion×Post			0.067** (1.99)		
Post			0.029*** (2.58)		
B-Size	0.004*** (2.78)	0.004*** (2.88)	0.002 (0.81)	0.002 (1.01)	0.002 (1.03)
B-Outside	0.356*** (8.56)	0.357*** (8.57)	0.330*** (4.22)	0.329*** (6.58)	0.330*** (6.59)
B-Female	-0.018 (-1.14)	-0.019 (-1.19)	-0.003 (-0.07)	0.043** (2.37)	0.042** (2.33)
Duality	-0.017*** (-2.94)	-0.017*** (-2.97)	-0.026* (-1.89)	-0.019*** (-3.19)	-0.019*** (-3.18)
CEO-Owner	0.005 (0.16)	0.006 (0.20)	0.041 (0.54)	0.041 (1.12)	0.041 (1.13)
B-Owner	0.186*** (8.92)	0.185*** (8.89)	0.116** (2.04)	0.185*** (6.93)	0.184*** (6.88)
Institutional-Owner	0.042*** (3.41)	0.044*** (3.54)	0.012 (0.43)	0.026 (1.56)	0.025 (1.49)
SOE	0.081*** (14.94)	0.085*** (15.75)	0.020* (1.65)	0.003 (0.32)	0.005 (0.45)
Development	0.025*** (5.64)	0.025*** (5.59)	0.033*** (3.47)	0.088*** (3.61)	0.089*** (3.65)
Competition	-0.103*** (-5.74)	-0.103*** (-5.74)	-0.100** (-2.54)	-0.071*** (-3.60)	-0.071*** (-3.59)
Performance-TQ	0.004** (2.46)	0.005*** (2.59)	-0.009** (-2.25)	0.003* (1.77)	0.004* (1.89)
F-Size-Assets	0.089*** (38.24)	0.089*** (38.48)	0.083*** (17.60)	0.095*** (23.36)	0.096*** (23.62)
Capital-Intensity	-0.012*** (-11.86)	-0.012*** (-11.91)	-0.007*** (-3.59)	-0.006*** (-6.55)	-0.006*** (-6.57)
F-Age-Listing	-0.038*** (-11.84)	-0.038*** (-11.82)	-0.033*** (-4.58)	-0.028*** (-4.80)	-0.029*** (-4.86)
Financial-Leverage	-0.413*** (-29.64)	-0.413*** (-29.66)	-0.344*** (-11.40)	-0.302*** (-18.54)	-0.302*** (-18.55)
Constant	-0.606*** (-11.77)	-0.617*** (-12.00)	-0.333*** (-3.32)	-0.682*** (-7.73)	-0.699*** (-7.93)
<i>N</i>	23847	23847	4416	28796	28796
<i>R</i> ²	0.16	0.16	0.18	0.06	0.06
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Industry-fixed effects	Yes	Yes	Yes	No	No
Firm-fixed effects	No	No	No	Yes	Yes
Error cluster (Dual)	Yes	Yes	Yes	No	No

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.

Table 11: Partial privatization and ESG performance (Controlling endogeneity through PSM).

	Partial privatization and ESG performance: Controlling endogeneity through PSM					
	Univariate analysis of the PSM-matched sample			Regression results		
	Mean of firms with partial privatization	Mean of firms without partial privatization	Compare mean analysis (t-test)	1 st stage results	2 nd stage results	
				<i>DV = Privatize-Dummy</i>	<i>DV = ESG-Performance</i>	
	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Privatize-Dummy					0.028*** (5.87)	
Privatize-Proportion						0.028* (1.64)
Privatize-Proportion×Post						
Post						
B-Size	8.982	8.989	(0.241)	0.028*** (4.80)	0.003* (1.71)	0.003* (1.73)
B-Outside	0.370	0.369	(-0.956)	-0.172 (-0.97)	0.356*** (7.09)	0.357*** (7.10)
B-Female	0.133	0.134	(0.2050)	-0.090 (-1.31)	-0.004 (-0.18)	-0.005 (-0.23)
Duality	0.185	0.183	(-0.279)	-0.044* (-1.80)	-0.032*** (-4.01)	-0.032*** (-4.00)
CEO-Owner	0.022	0.023	(0.414)	0.628*** (4.23)	0.033 (0.65)	0.031 (0.61)
B-Owner	0.053	0.053	(-0.068)	-0.573*** (-5.49)	0.168*** (4.43)	0.167*** (4.38)
Institutional-Owner	0.532	0.533	(0.292)	0.376*** (6.95)	0.024 (1.50)	0.024 (1.48)
SOE	0.613	0.615	(0.239)	0.430*** (19.75)	0.075*** (11.33)	0.078*** (11.24)
Development	0.607	0.612	(0.647)	-0.072*** (-3.82)	0.033*** (6.07)	0.033*** (6.05)
Competition	0.142	0.141	(-0.372)	0.008 (0.10)	-0.161*** (-6.85)	-0.160*** (-6.84)
Performance-TQ	2.029	2.001	(-1.236)	0.047*** (6.10)	0.000 (0.13)	0.000 (0.21)
F-Size-Assets	22.632	22.617	(-0.640)	0.126*** (12.89)	0.095*** (35.39)	0.095*** (35.38)
Capital-Intensity	2.645	2.677	(0.702)	-0.011*** (-2.92)	-0.011*** (-8.87)	-0.011*** (-8.91)
F-Age-Listing	2.405	2.416	(0.939)	0.104*** (7.21)	-0.039*** (-8.90)	-0.040*** (-9.04)
Financial-Leverage	0.475	0.475	(0.109)	-0.091* (-1.67)	-0.395*** (-22.33)	-0.395*** (-22.29)
Constant				-3.846*** (-17.72)	-0.637*** (-11.38)	-0.630*** (-11.24)
<i>N</i>	7226	7226		28795	14452	14452
<i>R</i> ²				0.10	0.21	0.20
Year-fixed effects				Yes	Yes	Yes
Industry-fixed effects				Yes	Yes	Yes
Error cluster (Dual)				No	Yes	Yes

Source: Authors' compilation. **Note:** t-statistics are in parentheses. *, **, ***, indicate significance at the 10%, 5%, and 1% levels, respectively. For variable descriptions, see Table 1.