

“Ownership concentration and firm performance: The joint role of institutional quality and firm size”

AUTHORS	Nguyen Thi Thu Thuy 
	 Nguyen Thi Kim Lien 
ARTICLE INFO	Nguyen Thi Thu Thuy and Nguyen Thi Kim Lien (2026). Ownership concentration and firm performance: The joint role of institutional quality and firm size. <i>Investment Management and Financial Innovations</i> , 23(4), 120–134. doi: 10.21511/imfi.23(4).2026.08
DOI	http://dx.doi.org/10.21511/imfi.23(4).2026.08
RELEASED ON	Thursday, 15 October 2026
RECEIVED ON	Friday, 03 April 2026
ACCEPTED ON	Wednesday, 23 September 2026
LICENSE	
	This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

59



NUMBER OF FIGURES

1



NUMBER OF TABLES

7

© The author(s) 2026. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Type of the article: Research Article

Received on: 3rd of April, 2026

Accepted on: 23rd of September, 2026

Published on: 15th of October, 2026

© Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien, 2026

Nguyen Thi Thu Thuy, Ph.D., Faculty of Management, Ho Chi Minh City University of Law, Ho Chi Minh City, Vietnam. (Corresponding author)

Nguyen Thi Kim Lien, Ph.D., Assistant Professor, Department of Industrial Management, Asia Eastern University of Science and Technology, New Taipei City, Taiwan.



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license, which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

Conflict of interest statement:

Author(s) reported no conflict of interest

Nguyen Thi Thu Thuy (Vietnam), Nguyen Thi Kim Lien (Taiwan)

OWNERSHIP CONCENTRATION AND FIRM PERFORMANCE: THE JOINT ROLE OF INSTITUTIONAL QUALITY AND FIRM SIZE

Abstract

Ownership concentration (OC) remains a subject of debate in emerging markets, particularly under heterogeneous institutional conditions and firm characteristics. This study examines how ownership concentration affects firm performance (FP) in Vietnam, while also analyzing the roles of firm size and subnational institutional quality in shaping this relationship. Using a balanced panel dataset of 425 non-financial listed companies over the period 2015–2024, the analysis applies the two-step system GMM approach to mitigate potential endogeneity concerns, with institutional quality proxied by the Provincial Competitiveness Index (PCI). The findings indicate that ownership concentration exerts a positive and economically meaningful effect on firm performance. This effect is substantially strengthened by both firm size and institutional quality, indicating pronounced heterogeneity across firms and regions. Specifically, the performance-enhancing role of ownership concentration is more evident in larger firms and in provinces with stronger institutional environments. In addition, the three-way interaction among ownership concentration, firm size, and institutional quality is significant, suggesting that these factors jointly reinforce the effectiveness of ownership concentration. The findings show that the performance implications of ownership concentration are shaped by the interaction between local institutional conditions and firm-specific factors.

Keywords

governance, institutions, heterogeneity, firm size, panel data, endogeneity, Vietnam, emerging markets

JEL Classification

G32, G34, C23, O16

INTRODUCTION

Ownership concentration (OC) is a defining characteristic of corporate ownership structures in many emerging and transition economies, where a relatively small number of investors often hold substantial control rights (La Porta et al., 1999; Claessens et al., 2002). Such ownership arrangements may influence firm performance (FP) through competing mechanisms. Concentrated ownership can strengthen oversight and reduce agency conflicts between managers and shareholders. At the same time, dominant owners may have incentives to pursue private benefits that are not shared with minority investors (Jensen & Meckling, 1976; Shleifer & Vishny, 1997). These governance concerns are particularly relevant in countries where institutional arrangements and investor protection mechanisms remain unevenly developed (North, 1990).

Although ownership concentration has received considerable attention in the corporate governance literature, its consequences for firm performance remain open to debate. Existing studies provide inconsistent evidence, suggesting that the influence of OC varies across eco-

conomic environments and organizational settings (Morck et al., 1988; Himmelberg et al., 1999). As a result, understanding the circumstances under which concentrated ownership improves or weakens corporate performance continues to represent an important research challenge.

Among the contextual factors that may shape this association, institutional quality and firm size deserve particular attention. Institutional quality affects the effectiveness of governance enforcement and the protection of investor interests (La Porta et al., 1998; Peng et al., 2008). Firm size, in contrast, reflects differences in organizational complexity, resource endowments, and internal monitoring capacity (Demsetz & Lehn, 1985). Vietnam provides a suitable setting for examining these issues because both institutional development and business characteristics vary substantially across provinces and firms. While previous studies have typically investigated the moderating influence of institutional quality or firm size separately, limited evidence is available regarding their combined role in explaining the OC–FP nexus. In particular, little is known about whether ownership concentration, institutional quality, and firm size jointly interact to influence corporate performance (Aiken & West, 1991; Haans et al., 2016). Addressing this issue may contribute to a better understanding of governance mechanisms in transition economies and provide new evidence from the Vietnamese context.

1. LITERATURE REVIEW AND HYPOTHESES

Agency theory suggests that dispersed ownership may weaken the incentives of shareholders to monitor management effectively, thereby creating opportunities for agency conflicts (Jensen & Meckling, 1976). In this context, ownership concentration represents a governance arrangement through which major shareholders can exercise closer supervision over managerial decisions (Berle & Means, 1932; Fama & Jensen, 1983; Shleifer & Vishny, 1986; Morck et al., 1988). Because large shareholders bear a greater share of the costs and benefits associated with corporate decisions, they are more likely to engage in active monitoring, which can reduce agency-related inefficiencies and enhance firm performance.

However, the effect of ownership concentration is not uniform and reflects a fundamental trade-off between monitoring benefits and expropriation risks (Shleifer & Vishny, 1997; La Porta et al., 1998; Johnson et al., 2000; Dyck & Zingales, 2004). While concentrated ownership can enhance oversight and strategic control, particularly in environments with weak external governance (Claessens & Fan, 2002; Heugens et al., 2009), it may also enable tunneling and private benefit extraction by controlling shareholders (Claessens et al., 2000; Faccio & Lang, 2002).

Empirical evidence further suggests that the ownership–performance relationship is context-dependent and potentially endogenous, varying across institutional environments and firm characteristics (Demsetz, 1983; Demsetz & Lehn, 1985; Demsetz & Villalonga, 2001; Wintoki et al., 2012). In emerging markets, large shareholders may also contribute positively through access to resources, networks, and strategic expertise (Carney & Gedajlovic, 2001; Peng et al., 2008). In Vietnam, where investor protection remains relatively weak and ownership concentration is widespread, controlling shareholders are expected to play a particularly important governance role (Phung & Mishra, 2016; Vo et al., 2020).

Beyond firm-level governance, institutional theory emphasizes that firms operate within broader legal and regulatory environments that shape governance effectiveness and performance outcomes (North, 1990, 1991; Williamson, 2000; Scott, 2001; Acemoglu & Robinson, 2012). High-quality institutions characterized by transparency, rule enforcement, and property rights protection reduce agency costs and constrain opportunistic behavior (Djankov et al., 2003; Beck et al., 2003; Levine, 1999).

From a substitution–complementarity perspective, ownership concentration may substitute for weak external governance by providing internal monitoring when institutions are underdeveloped (Khanna & Palepu, 2010; La Porta et al., 1999; Love,

2011). However, weak institutions may also facilitate expropriation by controlling shareholders (Lins, 2003; Boubakri et al., 2005). Conversely, strong institutions complement internal governance by constraining opportunistic behavior and enhancing the value-creating role of ownership concentration (Acemoglu & Johnson, 2005; Heugens et al., 2009).

Importantly, institutional quality is not homogeneous within countries. Subnational variation in governance quality plays a significant role in shaping firm outcomes, especially in emerging economies (Malesky, 2014). In Vietnam, provincial differences captured by the Provincial Competitiveness Index (PCI) reflect variation in transparency, regulatory efficiency, and legal enforcement, thereby influencing firm-level governance effectiveness (Vo et al., 2020; Ha et al., 2024; Nguyen & van Dijk, 2012).

Firm size also plays a crucial role in shaping governance effectiveness. From a resource-based view, larger firms possess greater financial resources, more professional management, and more sophisticated internal control systems (Barney, 1991; Penrose, 1959). These characteristics enhance monitoring capacity and improve the effectiveness of ownership concentration in reducing agency costs (Claessens & Fan, 2002).

In contrast, smaller firms often rely on informal governance mechanisms and face resource constraints, which weaken monitoring effectiveness and increase entrenchment risks (Steffens et al., 2009; Zahra et al., 2000). These differences are particularly relevant in emerging markets where external governance mechanisms remain underdeveloped (Wright et al., 2005).

Overall, the literature suggests that the impact of ownership concentration on firm performance is not isolated but jointly shaped by institutional quality and firm size. These two factors interact to determine whether ownership concentration functions as a value-enhancing monitoring mechanism or a value-reducing expropriation channel. Therefore, examining higher-order interaction effects provides a more complete understanding of governance heterogeneity and conditional performance outcomes (Aiken & West, 1991; Haans et al., 2016; Liang et al., 2021).

This study therefore aims to examine the effect of ownership concentration on firm performance in Vietnam, while accounting for the moderating roles of provincial institutional quality and firm size. Accordingly, the following hypotheses are proposed:

H1: OC is positively associated with FP in Vietnam.

H2: The positive relationship between OC and FP becomes stronger as provincial institutional quality increases.

H3: The positive relationship between OC and FP becomes stronger as firm size increases.

H4: The positive relationship between OC and FP is jointly conditioned by provincial institutional quality and firm size, such that the effect is strongest among large firms located in provinces with higher institutional quality.

2. DATA AND METHODOLOGY

2.1. Sample and data sources

The empirical analysis uses a balanced panel dataset comprising 425 non-financial companies listed on HOSE and HNX continuously over the period 2015–2024, yielding 4,250 firm-year observations. Financial firms are excluded because they are subject to industry-specific regulations and reporting requirements. The sample includes firms with available audited financial statements and ownership data. Because the dynamic System GMM specification includes a one-period lagged dependent variable, the estimation sample contains 3,825 observations, corresponding to nine usable observations per firm.

To construct the balanced panel, firms with incomplete observations, newly listed firms, and delisted firms were excluded. This sample-selection requirement may create potential survivorship bias because continuously listed firms may differ from firms that entered or exited the market. Therefore, the findings may be more representative of continuously listed firms than of the broader population of Vietnamese listed companies.

Financial and ownership information is obtained from annual reports and official disclosures. Firms are matched to provinces based on the location of their headquarters, allowing the incorporation of provincial institutional indicators.

Provincial institutional quality is measured using the Provincial Competitiveness Index (PCI), obtained from the official PCI database published by the Vietnam Chamber of Commerce and Industry (VCCI) in collaboration with USAID for the period 2015–2024 (Vietnam Chamber of Commerce and Industry & USAID, n.d.). The corresponding PCI score is assigned to each firm-year observation to reflect changes in provincial institutional conditions over time.

2.2. Variables

Firm performance is measured by Tobin's Q, calculated as the ratio of the market value of equity plus book value of debt to the book value of total assets. Ownership concentration (*TOP*) serves as the principal explanatory variable and captures the governance role of concentrated ownership. Firm size (*Size*) is incorporated both as a control factor and as a moderator to examine whether the effect of ownership concentration varies across firms of different scales.

The analysis further incorporates a set of control variables, including board size (*BDR*), measured as the natural logarithm of the number of board members; board independence (*Ind*), measured as the proportion of independent directors; firm age (*Age*), measured as the natural logarithm of the number of years since establishment; financial leverage (*LEV*), measured as total liabilities divided by total assets; and a *Covid-19* dummy variable equal to one for the pandemic period and zero otherwise.

Provincial institutional quality is measured using the Provincial Competitiveness Index (PCI), published annually by the Vietnam Chamber of Commerce and Industry (VCCI) in collaboration with USAID. The original PCI scores range from 0 to 10, with higher values indicating a more favorable provincial business environment.

Following Nguyen et al. (2015) and Knudsen (2011), we construct a composite institutional quality mea-

sure (*PCI_index*) from four PCI sub-indices that are most relevant to firm performance: Transparency, Legal Institutions, Informal Charges, and Entry Costs. Each sub-index is standardized before aggregation to ensure comparability across dimensions. Higher values of *PCI_index* indicate better provincial institutional quality. The resulting composite index exhibits good internal consistency (Cronbach's $\alpha = 0.80$) and captures cross-provincial variation in institutional quality.

In line with earlier studies, ownership and governance variables are considered potentially endogenous. Detailed descriptions of all variables are provided in Appendix Table A1. For robustness purposes, FP is alternatively measured by return on assets (ROA).

2.3. Estimation approach

The empirical models are estimated using the two-step System Generalized Method of Moments (System GMM) estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998). This estimator is appropriate for dynamic panel data where the number of cross-sectional units exceeds the time dimension ($N > T$) and effectively addresses unobserved firm-specific heterogeneity, dynamic panel bias arising from the inclusion of the lagged dependent variable, and potential reverse causality (Nickell, 1981; Wintoki et al., 2012).

To ensure robust statistical inference, all models are estimated using the two-step System GMM estimator with Windmeijer-corrected robust standard errors (Roodman, 2009). The lagged dependent variable, the main explanatory variables (*TOP*, *PCI_index*, and *Size*), and all interaction terms are treated as endogenous and instrumented using their own lagged values (Bun & Sarafidis, 2015). GMM-style instruments are constructed using lags ($t - 2$) to ($t - 3$) for the differenced equation and lagged first differences at ($t - 1$) for the level equation.

To mitigate instrument proliferation and preserve the power of the Hansen test (Roodman, 2009), the instrument matrix is collapsed. Consequently, the number of instruments remains well below the number of cross-sectional units (425) across all model specifications. In addition, all regressions

include year fixed effects to control for common time-varying shocks affecting all firms over time. The COVID-19 dummy is retained to capture the specific effect of the pandemic period. Given the potential overlap between the COVID-19 dummy and year fixed effects, we further verified this specification through additional robustness checks. The coefficients of the main explanatory variables and interaction terms remain qualitatively unchanged when the COVID-19 dummy is excluded.

Model validity is assessed using the Arellano–Bond tests for first-order [AR(1)] and second-order [AR(2)] serial correlation, together with the Hansen test and the Difference-in-Hansen test for the validity of the overidentifying restrictions and instrument exogeneity.

2.4. Research models

Three dynamic panel specifications are employed to examine the effect of OC on FP. The models progressively incorporate institutional quality, firm size, and their joint interaction to evaluate both separate and combined moderating effects.

The first specification focuses on the direct association between OC and FP.

$$TobinQ_{it} = \alpha_0 + \alpha_1 TobinQ_{i,t-1} + \beta_1 TOP_{it} + \sum_{k=1}^5 \gamma_k Control_{k,it} + \mu_i + \lambda_t + \varepsilon_{it}. \quad (1)$$

The second model introduces two-way interaction terms to test the moderating roles of provincial institutional quality and firm size:

$$TobinQ_{it} = \alpha_0 + \alpha_1 TobinQ_{i,t-1} + \beta_1 TOP_{it} + \beta_2 PCI_index_{it} + \beta_3 Size_{it} + \beta_4 (TOP_{it} \cdot PCI_index_{it}) + \beta_5 (TOP_{it} \cdot Size_{it}) + \beta_6 (PCI_index_{it} \cdot Size_{it}) + \sum_{k=1}^5 \gamma_k Control_{k,it} + \mu_i + \lambda_t + \varepsilon_{it}. \quad (2)$$

The final model incorporates the three-way interaction term to examine the joint moderating effect of institutional quality and firm size:

$$TobinQ_{it} = \alpha_0 + \alpha_1 TobinQ_{i,t-1} + \beta_1 TOP_{it} + \beta_2 PCI_index_{it} + \beta_3 Size_{it} + \beta_4 (TOP_{it} \cdot PCI_index_{it}) + \beta_5 (TOP_{it} \cdot Size_{it}) + \beta_6 (PCI_index_{it} \cdot Size_{it}) + \beta_7 (TOP_{it} \cdot PCI_index_{it} \cdot Size_{it}) + \sum_{k=1}^5 \gamma_k Control_{k,it} + \mu_i + \lambda_t + \varepsilon_{it}. \quad (3)$$

Here, i and t indicate firms and years, respectively. *TobinQ* is the measure of FP, whereas *TOP* reflects OC. *PCI_index* and *Size* are the moderating variables representing institutional quality and firm size. *Control* is a vector comprising BDR, Ind, Age, LEV, and Covid_19. α_0 is the constant, μ_i and λ_t denote firm and year effects, respectively, and ε_{it} is the error term.

3. RESULTS

3.1. Descriptive statistics

Descriptive statistics for the sample are presented in Table 1. The dataset comprises 4,250 firm-year observations covering 425 non-financial listed firms from 2015 to 2024. The descriptive statistics exclude the COVID-19 dummy variable.

On average, Tobin's Q is 1.03, while ROA averages 0.10. Ownership concentration (*TOP*) averages 0.49, indicating substantial concentration among Vietnamese listed firms. The provincial institutional quality index (*PCI_index*) has a mean of 6.17. Firm size (*Size*) has a mean of 6.36, where *Size* is measured as the natural logarithm of total assets in billion VND. Average board size (*BDR*) is 1.70 in logarithmic terms, with the observed range corresponding approximately to boards of 5–11 members. Independent directors (*Ind*) account for 28% of board seats. Firm age and leverage (*LEV*) have mean values of 2.96 and 0.51, respectively.

3.2. Correlation matrix and multicollinearity diagnostics

The Pearson correlation results are presented in Table 2. Most explanatory variables exhibit rela-

Table 1. Summary statistics for the balanced panel sample (2015–2024)

Variable	Observation	Std. dev.	Mean	Min	Max
TobinQ	4,250	0.55	1.03	0.01	9.04
ROA	4,250	0.08	0.10	−0.29	0.31
TOP	4,250	0.19	0.49	0.05	0.83
PCI_index	4,250	0.62	6.17	4.67	7.61
Size	4,250	1.47	6.36	2.76	12.57
Ind	4,250	0.08	0.28	0.1	0.45
BDR	4,250	0.16	1.70	1.61	2.40
Age	4,250	0.67	2.96	0.69	4.51
LEV	4,250	0.22	0.51	0.01	0.97

Notes: The table reports summary measures for all variables included in the analysis. Observation refers to the total number of observations; Std. Dev. indicates the standard deviation, while Min and Max represent the lowest and highest observed values, respectively.

Table 2. Correlation matrix of variables

Variables	TobinQ	TOP	PCI_index	Size	BDR	Ind	LEV	Age	Covid_19
TobinQ	1.000								
TOP	0.119***	1.000							
PCI_index	0.007	0.024	1.000						
Size	0.138***	0.087***	−0.060***	1.000					
BDR	0.100***	−0.097***	0.009	0.290***	1.000				
LEV	−0.137***	0.025*	−0.002	0.301***	−0.034**	1.000			
Ind	−0.023	0.027*	−0.011	−0.005	−0.055***	−0.020	1.000		
Age	0.068***	0.082***	−0.045**	0.053***	0.034**	0.056***	0.016	1.000	
Covid_19	0.031**	0.004	0.000	0.021	0.009	−0.012	0.060***	0.060***	1.000

Notes: Pearson correlation coefficients are reported in the lower triangle. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. The reported VIF values correspond to the explanatory variables in the baseline specification. Variable definitions are provided in Appendix A1.

tively modest correlations, indicating an acceptable degree of independence among regressors. To further assess potential multicollinearity arising from the inclusion of the two-way and three-way interaction terms, Variance Inflation Factor (VIF) statistics were computed for the full model specification. As reported in Appendix Table A2, all VIF values remain below the commonly accepted threshold of 10 (Gujarati, 2004), indicating that multicollinearity is not a serious concern.

3.3. Baseline regression results

Table 3 summarizes the estimates obtained from the dynamic panel specifications. Given the dynamic specification, the reported coefficients are interpreted as short-run effects, conditional on the persistence captured by the lagged dependent variable. Model 1 examines the direct relationship between OC and FP. Model 2 introduces two-way interaction terms to evaluate the moderating roles of institutional quality and firm size, whereas Model 3 extends the analysis by incorporating the

three-way interaction among OC, institutional quality, and firm size.

Across all specifications, post-estimation diagnostic tests support the validity of the System GMM framework. The Arellano–Bond AR(1) test shows marginal evidence of first-order serial correlation in Model 1 ($p = 0.067$) and statistically significant results in Models 2 and 3 ($p < 0.01$), which is expected in first-differenced dynamic panel models. More importantly, the AR(2) test indicates no evidence of second-order serial correlation ($p = 0.813$ in Model 1, $p = 0.304$ in Model 2, and $p = 0.391$ in Model 3), supporting the use of lagged variables as instruments. The Hansen and Difference-in-Hansen tests further confirm the validity of the instrument set.

Focusing on Model 1, the coefficient on TOP is positive and significant ($\beta = 0.208$, $p < 0.01$). The estimated coefficient indicates that a higher degree of ownership concentration is associated with improved firm performance. This finding

Table 3. Dynamic panel estimates: Direct, two-way, and three-way effects

Variables	Model 1	Model 2	Model 3
Lag.TobinQ	0.647*** (0.036)	0.868*** (0.032)	0.572*** (0.094)
TOP	0.208*** (0.024)	0.439*** (0.060)	0.678*** (0.124)
PCI_index		0.745*** (0.086)	0.860*** (0.129)
Size	0.029 (0.115)	0.652*** (0.023)	0.780*** (0.015)
TOP × PCI_index		0.524*** (0.072)	0.902*** (0.275)
TOP × Size		0.504** (0.253)	0.985*** (0.009)
PCI_index × Size		0.448*** (0.011)	0.027* (0.015)
TOP × PCI_index × Size			0.136*** (0.018)
BDR	−0.041 (0.062)	−0.111 (0.128)	−0.750*** (0.100)
Ind	0.436*** (0.059)	0.213*** (0.077)	0.675 (0.524)
Age	0.602*** (0.139)	0.086 (0.426)	0.281** (0.134)
LEV	−0.427** (0.203)	0.051 (0.201)	0.320** (0.134)
Covid_19	−0.011 (0.018)	−0.002 (0.018)	−0.012 (0.015)
Number of observations	3825	3825	3825
Number of groups	425	425	425
Number of instruments	29	52	49
AR(1) p-value	0.067	0.001	0.001
AR(2) p-value	0.813	0.304	0.391
Hansen p-value	0.230	0.408	0.624
Difference-in-Hansen	0.321	0.413	0.356

Notes: Two-step System GMM estimates for 425 non-financial firms (2015–2024). TobinQ is the dependent variable. Windmeijer-corrected robust standard errors are in parentheses. *, **, and *** denote significance at 10%, 5%, and 1%, respectively. AR(1) and AR(2) are Arellano–Bond tests for serial correlation ($N(0,1)$). Hansen and Difference-in-Hansen tests evaluate overidentifying restrictions/instrument exogeneity. Variable definitions are in Appendix A1.

is consistent with the view that concentrated ownership enhances monitoring incentives and limits agency-related problems within firms (Shleifer & Vishny, 1997; Anderson & Reeb, 2003; Heugens et al., 2009). Among the control variables, *Age* is positively related to FP, whereas *LEV* is associated with lower performance. These results suggest that more established firms tend to perform better, while higher leverage and adverse economic disruptions may exert downward pressure on firm value. The moderating effects of institutional quality and firm size are examined in Model 2.

3.4. Moderating roles of institutional quality and firm size

Model 2 introduces interaction terms to examine the moderating roles of institutional quality and firm size.

The coefficient on the interaction term $TOP \times PCI_index$ is positive and significant at the 1% level ($\beta = 0.524$), suggesting that the beneficial impact of OC on FP becomes more pronounced in regions characterized by stronger institutional environments. This finding supports Hypothesis 2 and

aligns with institutional theory, which emphasizes that strong legal and regulatory environments enhance the effectiveness of governance mechanisms (La Porta et al., 1998; Lins, 2003; Heugens et al., 2009). It is also consistent with recent evidence from Vietnam highlighting the importance of subnational institutional variation (Vo et al., 2020; Ha et al., 2024).

Similarly, the interaction between ownership concentration and firm size ($TOP \times Size$) is positive and significant ($\beta = 0.504, p < 0.05$), suggesting that the impact of ownership concentration becomes stronger as firm size increases. This result supports Hypothesis 3 and is consistent with prior studies showing that larger firms possess more complex organizational structures and require stronger governance mechanisms (Demsetz & Lehn, 1985; Claessens & Fan, 2002).

Taken together, the evidence suggests that both institutional conditions and firm characteristics shape the effectiveness of ownership concentration as a governance mechanism.

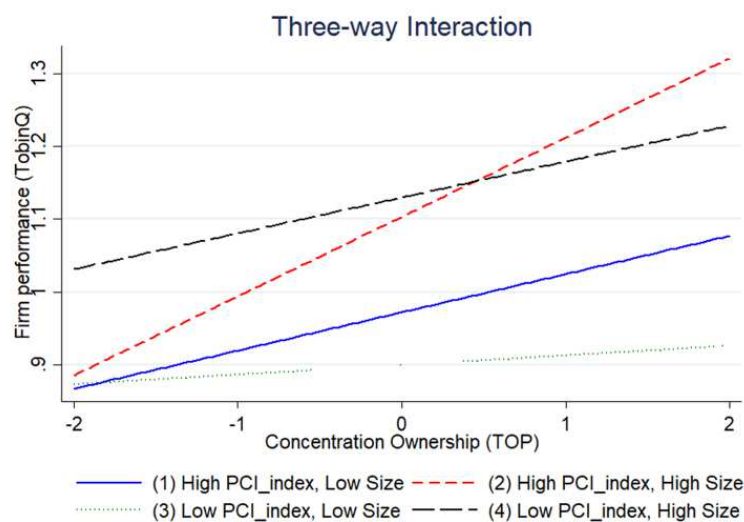
3.5. Three-way interaction effects

Model 3 indicates that the three-way interaction term among ownership concentration, institutional quality, and firm size is positive and statistically significant ($\beta = 0.136, p < 0.01$), thereby supporting Hypothesis 4.

This result implies that the impact of ownership concentration on firm performance is not uniform but jointly conditioned by both institutional quality and firm size. Specifically, the positive effect of ownership concentration becomes stronger for larger firms operating in provinces with higher institutional quality, whereas it weakens for smaller firms and those located in less developed institutional environments.

3.6. Joint moderating effects

Model 3 extends the analysis by incorporating the three-way interaction among TOP , PCI_index , and $Size$. The estimated coefficient of the three-way interaction is positive and statistically significant ($\beta = 0.136, p < 0.01$), providing statistical support for Hypothesis 4. Following Dawson and Richter (2006) and Haans et al. (2016), the substantive implications of this higher-order interaction are interpreted using marginal effects rather than the interaction coefficient alone. Figure 1 illustrates how the marginal effect of ownership concentration on firm performance varies across different combinations of institutional quality and firm size. The results show that the positive association between ownership concentration and firm performance is strongest for high institutional quality and high firm size, and weakest for low institutional quality and low firm size.



Notes: This figure illustrates the three-way interaction, showing that the relationship between OC and FP jointly depends on the institutional environment (PCI_index) and firm size ($Firm\ Size$). Slopes (1)–(4) represent combinations of high/low PCI_index and firm size (measured at ± 1 standard deviation from the mean). All variables are standardized to facilitate the interpretation of marginal effects.

Figure 1. Three-way Interaction Effects of OC, PCI_index , and Firm Size on FP

formance is stronger among larger firms operating in provinces with higher institutional quality, whereas the effect is weaker among smaller firms and firms located in provinces with less favorable institutional environments. These findings highlight the importance of considering multiple contextual factors when examining governance mechanisms and suggest that two-way interaction models may not fully capture the conditional nature of the ownership–performance relationship.

3.7. Robustness analyses

To examine whether the main conclusions remain stable under alternative specifications, supplementary analyses are performed using different measures of firm performance and institutional conditions.

3.7.1. ROA-based specification

To evaluate the sensitivity of the main findings, Models 2 and 3 are re-estimated using return on

assets (ROA) instead of TobinQ. Unlike TobinQ, ROA captures accounting-based performance and is more closely related to firms' operating outcomes.

The estimation results are reported in Table 4. The interaction terms involving *TOP*, *PCI_index*, and *Size* retain their expected signs and remain statistically significant. In particular, the coefficients associated with $TOP \times PCI_index$ and $TOP \times Size$ continue to support the moderating roles of institutional quality and firm size. The three-way interaction term also remains significant, suggesting that the contribution of OC to firm performance is most pronounced among larger firms located in provinces with stronger institutional conditions.

Taken together, the evidence obtained from the ROA specification is broadly consistent with the main results, indicating that the conclusions are not sensitive to the choice of performance measure.

Table 4. ROA-based system GMM estimates

Variables	Two-way	Three-way
Lag.ROA	0.538*** (0.049)	0.658*** (0.045)
TOP	0.324*** (0.019)	0.390*** (0.127)
PCI_index	0.044* (0.023)	0.114* (0.065)
Size	0.020** (0.009)	0.020*** (0.007)
TOP × PCI_index	0.078* (0.045)	0.270*** (0.034)
TOP × Size	0.039** (0.019)	0.053*** (0.017)
PCI_index × Size	0.004** (0.002)	0.018** (0.009)
TOP × PCI_index × Size		0.041** (0.019)
Controls	Yes	Yes
Year dummies	Yes	Yes
Number of observations	3825	3825
Number of groups	425	425
Number of instruments	75	86
AR (1) test – p-value	0.000	0.000
AR (2) test – p-value	0.142	0.150
Hansen test	0.142	0.122
Difference-in-Hansen	0.522	0.481

Notes: Two-step System GMM estimates for 425 non-financial firms (2015–2024). ROA is the dependent variable. Windmeijer-corrected robust standard errors are reported in parentheses. AR(1) and AR(2) denote the Arellano–Bond tests for serial correlation. Hansen and Difference-in-Hansen evaluate instrument validity. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

3.7.2. Alternative measures of provincial institutional quality

As a second robustness check, the composite *PCI_index* used in the baseline analysis is replaced by each of its four constituent dimensions – Transparency, Legal Institutions, Entry Costs, and Informal Charges – which are entered separately into the System GMM model. This specification examines whether the baseline findings are driven by any single dimension of provincial institutional quality rather than by the composite index.

The results remain qualitatively consistent across all four specifications (Table 5). Transparency reduces information asymmetry (Knudsen, 2011), legal institutions strengthen contract enforcement (North, 1990; La Porta et al., 1999), entry costs reflect administrative barriers, and informal charges reflect governance distortions (Faccio & Lang, 2002). Despite capturing different aspects of the institutional environment, each component produces results that are consistent with those obtained using the composite *PCI_index*.

Taken together, these findings reinforce the conclusion that the effect of ownership concentration on firm performance is jointly conditioned by provincial institutional quality and firm size.

3.8. Testing for non-linear effects

To address potential functional form misspecification, we further test whether ownership concentration exhibits a non-monotonic (U-shaped or inverted U-shaped) relationship with firm performance. Specifically, a quadratic term of ownership concentration (Top^2) was introduced into the baseline empirical model. The estimated coefficient of Top^2 was statistically insignificant ($p > 0.10$), indicating no empirical support for non-linear dynamics in our sample. Consequently, to maintain model parsimony and prevent severe multicollinearity in the presence of higher-order interaction terms ($TOP \times PCI_index \times Size$), we retain the linear specification for ownership concentration in our primary and interaction specifications.

Table 5. Robustness checks: Alternative measures of provincial institutional quality

Variables	(1) Transparency	(2) Legal Institutions	(3) Entry Costs	(4) Informal Charges
TOP	2.454** (1.085)	8.352* (4.290)	21.387*** (8.285)	27.641*** (8.389)
Component	2.983** (1.390)	0.659** (0.311)	1.617** (0.665)	1.763*** (0.654)
Size	3.123** (1.434)	0.809** (0.331)	1.320** (0.565)	1.301** (0.605)
$TOP \times Component$	5.691* (3.189)	1.147* (0.612)	3.211** (1.343)	4.133*** (1.354)
$TOP \times Size$	5.709* (3.281)	0.664* (0.397)	2.698** (1.154)	3.177*** (1.208)
$Component \times Size$	0.445** (0.195)	0.115** (0.048)	0.189** (0.091)	0.181* (0.098)
$TOP \times Component \times Size$	0.809* (0.446)	0.093** (0.041)	0.396** (0.186)	0.460** (0.196)
Controls	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Number of observations	3,825	3,825	3,825	3,825
Number of groups	425	425	425	425
Number of instruments	46	76	63	78
AR (1) test – p-value	0.003	0.001	0.008	0.003
AR (2) test – p-value	0.266	0.564	0.103	0.768
Hansen test	0.374	0.100	0.129	0.253
Difference-in-Hansen	0.345	0.431	0.421	0.331

Notes: Two-step system GMM estimates. TobinQ is the dependent variable. Component refers to the PCI dimension included in each model. Robust standard errors are reported in parentheses. *, **, and *** indicate significance at conventional levels.

3.9. Summary of hypothesis testing

The hypothesis-testing results provide overall support for the proposed relationships. The positive association between ownership concentration and firm performance supports *H1*. The positive moderating effect of provincial institutional quality supports *H2*, while the positive moderating effect of firm size supports *H3*. Furthermore, the significant three-way interaction among ownership concentration, provincial institutional quality, and firm size supports *H4*. The marginal-effect analysis further indicates that the positive association between ownership concentration and firm performance is strongest among larger firms operating in provinces with higher institutional quality. These findings are broadly consistent with the robustness analyses using ROA and alternative measures of provincial institutional quality.

4. DISCUSSION

The results suggest that ownership concentration is associated with improved firm performance among Vietnamese listed firms. This pattern may reflect the greater ability of dominant shareholders to oversee management and influence strategic decisions. Similar conclusions emerge under alternative performance measures, indicating that the main findings are stable across model specifications (Demsetz & Villalonga, 2001).

The analysis also underscores the relevance of institutional quality. Higher PCI scores are associated with a stronger positive relationship between OC and FP. In provinces with better transparency, stronger legal enforcement, and more efficient regulatory environments, large shareholders may be more effective in exercising control and reducing agency and transaction costs. This underscores the role of subnational institutional quality as a key condition shaping corporate governance effectiveness in emerging markets, in line with institutional theory (North, 1990; Acemoglu & Johnson, 2005).

Firm size also plays a significant moderating role. The effect of ownership concentration is stronger in larger firms, where organizational

complexity and agency costs are higher. In such firms, concentrated ownership may be associated with improved monitoring efficiency and managerial discipline.

Importantly, the study documents a significant three-way interaction among ownership concentration, provincial institutional quality, and firm size. The marginal-effect analysis indicates that the positive association between ownership concentration and firm performance is strongest among large firms operating in high-PCI provinces, while its effect is weaker in smaller firms and in lower-quality institutional environments. This demonstrates that ownership effects are jointly determined by both internal firm characteristics and external institutional conditions.

The analysis provides further evidence that the effect of ownership concentration depends on the combined influence of institutional quality and firm size. This finding suggests that governance outcomes are shaped by interconnected factors rather than by isolated moderating mechanisms (Dawson & Richter, 2006; Haans et al., 2016). The findings should therefore be interpreted as conditional associations rather than definitive causal effects.

Notwithstanding these findings, several limitations should be acknowledged. First, ownership concentration (TOP) is measured as the shareholding percentage of the five largest shareholders without distinguishing among owner types (e.g., state, foreign, institutional, or family ownership). Future research could examine these ownership categories separately to provide a more nuanced understanding of the ownership–performance relationship.

Second, although the System GMM estimator addresses important endogeneity concerns, its reliance on internal instruments does not by itself establish causal relationships. Future studies could employ quasi-experimental settings, regulatory reforms, or other exogenous shocks to strengthen causal identification.

Third, institutional quality is measured based on the province where a firm's headquarters is

located. Potential location-selection bias cannot be entirely ruled out, as firms may select into provinces with stronger institutions or successful firms may influence local institutional development. Future research could use firm relocation events or multi-location firms to examine this issue further.

Finally, the study assumes a linear relationship between ownership concentration and firm performance. Future research could investigate potential nonlinear effects, such as quadratic or threshold relationships, documented in the corporate governance literature.

CONCLUSION

This study investigates the relationship between OC and FP among Vietnamese listed firms while accounting for local institutional conditions and firm size. Using system GMM estimates for 2015–2024, the results show that OC is positively associated with FP. The findings further indicate that this effect becomes stronger in provinces with higher institutional quality and among larger firms. In addition, the significant three-way interaction suggests that the influence of OC depends on the combined effect of institutional quality and firm size. Overall, the results emphasize that governance outcomes are shaped by both external institutional conditions and firm-specific characteristics. The study provides additional evidence on the role of contextual factors in explaining variations in governance effectiveness across emerging-market firms.

AUTHOR CONTRIBUTIONS

Conceptualization: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Data curation: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Formal analysis: Nguyen Thi Thu Thuy.
 Investigation: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Methodology: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Project administration: Nguyen Thi Thu Thuy.
 Resources: Nguyen Thi Thu Thuy.
 Software: Nguyen Thi Thu Thuy.
 Supervision: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Validation: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Visualization: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Writing – original draft: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.
 Writing – review & editing: Nguyen Thi Thu Thuy, Nguyen Thi Kim Lien.

REFERENCES

1. Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy*, 113(5), 949-995. <https://doi.org/10.1086/432166>
2. Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Business.
3. Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
4. Anderson, R. C., & Reeb, D. M. (2003). Founding-family ownership and firm performance: Evidence from the S&P 500. *The Journal of Finance*, 58(3), 1301-1328. <https://doi.org/10.1111/1540-6261.00567>
5. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
6. Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120. <https://doi.org/10.1177/014920639101700108>
7. Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law and finance: Why does legal origin matter? *Journal of Comparative Economics*, 31(4), 653-675. <https://doi.org/10.1016/j.jce.2003.08.001>
8. Berle, A. A., & Means, G. C. (1932). *The modern corporation and private property*. Macmillan.
9. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic

- panel data models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
10. Boubakri, N., Cosset, J.-C., & Guedhami, O. (2005). Post-privatization corporate governance: The role of ownership structure and investor protection. *Journal of Financial Economics*, 76(2), 369-399. <https://doi.org/10.1016/j.jfineco.2004.05.003>
 11. Bun, M. J. G., & Sarafidis, V. (2015). Dynamic panel data models. In B. H. Baltagi (Ed.), *The Oxford handbook of panel data* (pp. 76-110). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199940042.013.0003>
 12. Carney, M., & Gedajlovic, E. R. (2001). Corporate governance and firm capabilities: A comparison of managerial, alliance, and personal capitalisms. *Asia Pacific Journal of Management*, 18(3), 335-354. <https://doi.org/10.1023/A:1010649828352>
 13. Claessens, S., & Fan, J. P. H. (2002). Corporate governance in Asia: A survey. *International Review of Finance*, 3(2), 71-103. <https://doi.org/10.1111/1468-2443.00034>
 14. Claessens, S., Djankov, S., & Lang, L. H. P. (2000). The separation of ownership and control in East Asian corporations. *Journal of Financial Economics*, 58(1-2), 81-112. [https://doi.org/10.1016/S0304-405X\(00\)00067-2](https://doi.org/10.1016/S0304-405X(00)00067-2)
 15. Claessens, S., Djankov, S., Fan, J. P. H., & Lang, L. H. P. (2002). Disentangling the incentive and entrenchment effects of large shareholdings. *The Journal of Finance*, 57(6), 2741-2771. <https://doi.org/10.1111/1540-6261.00511>
 16. Dawson, J. F., & Richter, A. W. (2006). Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *Journal of Applied Psychology*, 91(4), 917-926. <https://doi.org/10.1037/0021-9010.91.4.917>
 17. Demsetz, H. (1983). The structure of ownership and the theory of the firm. *Journal of Law and Economics*, 26(2), 375-390. <https://doi.org/10.1086/467041>
 18. Demsetz, H., & Lehn, K. (1985). The structure of corporate ownership: Causes and consequences. *Journal of Political Economy*, 93(6), 1155-1177. <https://doi.org/10.1086/261354>
 19. Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of Corporate Finance*, 7(3), 209-233. [https://doi.org/10.1016/S0929-1199\(01\)00020-7](https://doi.org/10.1016/S0929-1199(01)00020-7)
 20. Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2003). Courts. *The Quarterly Journal of Economics*, 118(2), 453-517. <https://doi.org/10.1162/003355303321675437>
 21. Dyck, A., & Zingales, L. (2004). Private benefits of control: An international comparison. *The Journal of Finance*, 59(2), 537-600. <https://doi.org/10.1111/j.1540-6261.2004.00642.x>
 22. Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics*, 65(3), 365-395. [https://doi.org/10.1016/S0304-405X\(02\)00146-0](https://doi.org/10.1016/S0304-405X(02)00146-0)
 23. Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics*, 26(2), 301-325. <https://doi.org/10.1086/467037>
 24. Gujarati, D. N. (2004). *Basic econometrics* (4th ed.). McGraw-Hill.
 25. Ha, V., Andre, J., Tran Kim, A., & Nguyen Thi Thu, H. (2024). Total factor productivity and institutional quality in Vietnam: Which institutions matter most? *Asia-Pacific Journal of Regional Science*, 8(2), 705-736. <https://doi.org/10.1007/s41685-024-00343-9>
 26. Haans, R. F. J., Pieters, C., & He, Z.-L. (2016). Thinking about U: Theorizing and testing U- and inverted U-shaped relationships. *Strategic Management Journal*, 37(7), 1177-1195. <https://doi.org/10.1002/smj.2399>
 27. Heugens, P. P. M. A. R., van Essen, M., & van Oosterhout, J. H. (2009). Meta-analyzing ownership concentration and firm performance in Asia: Towards a more fine-grained understanding. *Asia Pacific Journal of Management*, 26(3), 481-512. <https://doi.org/10.1007/s10490-008-9109-0>
 28. Himmelberg, C. P., Hubbard, R. G., & Palia, D. (1999). Understanding the determinants of managerial ownership and the link between ownership and performance. *Journal of Financial Economics*, 53(3), 353-384. [https://doi.org/10.1016/S0304-405X\(99\)00025-2](https://doi.org/10.1016/S0304-405X(99)00025-2)
 29. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
 30. Johnson, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2000). Tunneling. *The American Economic Review*, 90(2), 22-27. <https://doi.org/10.1257/aer.90.2.22>
 31. Khanna, T., & Palepu, K. G. (2010). *Winning in emerging markets: A road map for strategy and execution*. Harvard Business Press.
 32. Knudsen, J. S. (2011). Company delistings from the UN Global Compact: Limited business demand or domestic governance failure? *Journal of Business Ethics*, 103(3), 331-349. <https://doi.org/10.1007/s10551-011-0875-0>
 33. La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (1999). Corporate ownership around the world. *The Journal of Finance*, 54(2), 471-517. <https://doi.org/10.1111/0022-1082.00115>
 34. La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, 106(6), 1113-1155. <https://doi.org/10.1086/250042>
 35. Levine, R. (1999). Law, finance, and economic growth. *Journal of Financial Intermediation*, 8(1-2), 8-35. <https://doi.org/10.1006/jfin.1998.0255>
 36. Liang, X., Tang, L., Xu, Z., & Lyu, X. (2021). Three-way interaction

- effect model: Moderating effect of resource between business age and host performance. *Frontiers in Psychology*, 12, Article 763633. <https://doi.org/10.3389/fpsyg.2021.763633>
37. Lins, K. V. (2003). Equity ownership and firm value in emerging markets. *Journal of Financial and Quantitative Analysis*, 38(1), 159-184. <https://doi.org/10.2307/4126768>
 38. Love, I. (2011). Corporate governance and performance around the world: What we know and what we don't. *The World Bank Research Observer*, 26(1), 42-70. <https://doi.org/10.1093/wbro/lkp030>
 39. Malesky, E. (2014). *The Vietnam Provincial Competitiveness Index: Measuring economic governance for private sector development: 2013 final report* (PCI Report No. 9). Vietnam Chamber of Commerce and Industry & United States Agency for International Development. Retrieved from <https://scholars.duke.edu/publication/1009559>
 40. Morck, R., Shleifer, A., & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*, 20(1-2), 293-315. [https://doi.org/10.1016/0304-405X\(88\)90048-7](https://doi.org/10.1016/0304-405X(88)90048-7)
 41. Nguyen, T. T., & van Dijk, M. A. (2012). Corruption, growth, and governance: Private vs. state-owned firms in Vietnam. *Journal of Banking & Finance*, 36(11), 2935-2948. <https://doi.org/10.1016/j.jbankfin.2012.03.027>
 42. Nguyen, T., Locke, S., & Reddy, K. (2015). Ownership concentration and corporate performance from a dynamic perspective: Does national governance quality matter? *International Review of Financial Analysis*, 41, 148-161. <https://doi.org/10.1016/j.irfa.2015.06.005>
 43. Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica*, 49(6), 1417-1426. <https://doi.org/10.2307/1911408>
 44. North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511808678>
 45. North, D. C. (1991). Institutions. *Journal of Economic Perspectives*, 5(1), 97-112. <https://doi.org/10.1257/jep.5.1.97>
 46. Peng, M. W., Wang, D. Y. L., & Jiang, Y. (2008). An institution-based view of international business strategy: A focus on emerging economies. *Journal of International Business Studies*, 39(5), 920-936. <https://doi.org/10.1057/palgrave.jibs.8400377>
 47. Penrose, E. T. (1959). *The theory of the growth of the firm*. Basil Blackwell.
 48. Phung, D. N., & Mishra, A. V. (2016). Ownership structure and firm performance: Evidence from Vietnamese listed firms. *Australian Economic Papers*, 55(1), 63-98. <https://doi.org/10.1111/1467-8454.12056>
 49. Roodman, D. (2009). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal*, 9(1), 86-136. <https://doi.org/10.1177/1536867X0900900106>
 50. Scott, W. R. (2001). *Institutions and organizations* (2nd ed.). Sage.
 51. Shleifer, A., & Vishny, R. W. (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94(3), 461-488. <https://doi.org/10.1086/261385>
 52. Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The Journal of Finance*, 52(2), 737-783. <https://doi.org/10.1111/j.1540-6261.1997.tb04820.x>
 53. Steffens, P. R., Davidsson, P., & Fitzsimmons, J. R. (2009). Performance configurations over time: Implications for growth- and profit-oriented strategies. *Entrepreneurship Theory and Practice*, 33(1), 125-148. <https://doi.org/10.1111/j.1540-6520.2008.00283.x>
 54. Vietnam Chamber of Commerce and Industry & USAID. (n.d.). *Provincial Competitiveness Index (PCI) – Data*. Retrieved from <https://pcivietnam.vn/du-lieu-pci>
 55. Vo, X. V., Nguyen, T. L. A., Tuan, L. Q., Luu, H. N., & Vu, K. T. (2020). Local business environment, domestic CEOs and firm performance in a transitional economy: Empirical evidence from Vietnam. *Economic Analysis and Policy*, 66, 236-249. <https://doi.org/10.1016/j.eap.2020.04.006>
 56. Williamson, O. E. (2000). The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature*, 38(3), 595-613. <https://doi.org/10.1257/jel.38.3.595>
 57. Wintoki, M. B., Linck, J. S., & Netter, J. M. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, 105(3), 581-606. <https://doi.org/10.1016/j.jfineco.2012.03.005>
 58. Wright, M., Filatotchev, I., Hoskisson, R. E., & Peng, M. W. (2005). Strategy research in emerging economies: Challenging the conventional wisdom. *Journal of Management Studies*, 42(1), 1-33. <https://doi.org/10.1111/j.1467-6486.2005.00487.x>
 59. Zahra, S. A., Neubaum, D. O., & Huse, M. (2000). Entrepreneurship in medium-size companies: Exploring the effects of ownership and governance systems. *Journal of Management*, 26(5), 947-976. <https://doi.org/10.1177/014920630002600509>

APPENDIX A

Table A1. Definition of variables

Category	Variables	Acronym	Unit / Type	Definition
Dependent variable	Tobin's Q	TobinQ	Ratio	The ratio of market value of equity plus book value of total liabilities to book value of total assets
	ROA	ROA	Ratio	The ratio of net income to total assets
Ownership structure variable	Ownership concentration (%)	TOP	%	Percentage of outstanding shares held by the five largest shareholders
Board structure variables	Board size	BDR	Log (number of directors)	The natural logarithm of the total number of directors
	Board independence	Ind	Ratio	The proportion of independent directors on the board
Institutional quality variables	Aggregate institutional quality index	PCI_index (standardized)	0-10	PCI_index: Composite index constructed from standardized PCI sub-indices: Transparency, Legal Institutions, Informal Charges, and Entry Costs. <i>Source:</i> VCCI–USAID PCI reports (2015–2024)
Moderator / Interaction variable	Firm Size	Size	Log (total assets in Billion VND)	Natural logarithm of total assets (Billion VND). Included as a control variable in baseline models and as a moderating variable in interaction specifications
Control variables	Firm age	Age	Log(Years)	The natural logarithm of the number of years since the firm was listed
	Financial leverage	LEV	Ratio	The ratio of total debt to total assets
	Covid-19 dummy	Covid_19	0/1	Equals 1 for 2020–2021, 0 otherwise

Note: TobinQ is the primary dependent variable; ROA is used for robustness tests. PCI_index is a composite of four standardized PCI sub-indices. Size serves as both a control and a moderating variable. BDR and Age are natural logarithms; Ind and LEV are ratios. Covid_19 equals 1 for 2020–2021 and 0 otherwise.

Table A2. Variance inflation factor (VIF) diagnostics

Variable	VIF
TOP	2.12
PCI_index	1.21
Size	1.04
BDR	3.21
LEV	2.11
Ind	3.01
Age	1.11
Covid_19	2.41
TOP × PCI_index	3.44
TOP × Size	3.12
PCI_index × Size	5.11
TOP × PCI_index × Size	6.24
Mean VIF	2.84

Note: VIF statistics are computed for the full baseline specification, including all control variables and the two-way and three-way interaction terms. All VIF values are below the commonly accepted threshold of 10, indicating that multicollinearity is not a serious concern.