



e-ISSN: 2550-1895

Available online at
<https://mar.uitm.edu.my/index.php>

Management And Accounting Review (25) 2026, 191-209

**Management And
Accounting
Review**

Corporate Governance and Recovery Performance: Evidence from Chinese Manufacturing Firms

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ARTICLE INFO

Article history:

Received 15 February 2026

Accepted 27 March 2026

Published 1 April 2026

Keywords:

GMM
Manufacturing
Corporate Governance
Financial Performance
Special Treatment

DOI:

10.24191/MAR.V25i01-12

ABSTRACT

This study examined how corporate governance relates to the recovery of Chinese listed manufacturing firms after exiting special treatment (ST). Using a sample of 182 A-share manufacturing firms that recovered between 2009 and 2023 and remained out of ST for at least three consecutive years, the study treated recovery as multidimensional: profitability restoration (ROA, ROE), financial resilience (ZChina score), and market confidence (Tobin's Q). A two-step system GMM dynamic panel model with year effects was used to control for performance persistence and endogeneity. Results showed that overall governance quality (G score) had a significant positive correlation with profitability restoration and financial resilience, indicating that better governance helps stabilise and improve recovery after ST exit. However, market confidence showed a different pattern: G score had a significant negative correlation with Tobin's Q, whereas the share of female directors and political connections had significant positive correlations with Tobin's Q. Overall, recovery is not a single-track process. These findings provide guidance for policymakers, board members, and investors when gauging governance quality and assessing sustainable recovery.

1. INTRODUCTION

China, as one of the key manufacturing hubs for the world, can send shocks to the global market via trade and supply chains when its manufacturing fluctuates (Carvalho, 2014). Over the past few decades, the sector had also been repeatedly affected by global economic shocks (Deng & Jie, 2025; Song et al., 2025). Against this backdrop, a number of manufacturing firms have been classified as special treatment (ST) firms. China's ST system is one of the distinctive mechanisms in China's regulation system, which can be used to publicly identify financially distressed firms, thereby imposing trading restrictions and impacting their

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external credibility. The ST label acts as an official risk warning to investors regarding financial instability (Liu et al., 2023; Shanghai Stock Exchange, 2024). Although some firms ultimately exit the ST status and return to their regular position in the marketplace, there is a growing focus among regulators on how well firms fare post-ST exit, particularly regarding their (1) improving in underlying business conditions and (2) disclosure practices, with the goal of lowering the odds of a subsequent ST designation (EY, 2021). According to statistics on the iFinD database, more than 40 A-share companies in 2023 were removed from the ST list (among them, about 25 were manufacturers), suggesting that such cases are not isolated (Hithink RoyalFlush Information Network Co., Ltd., 2026). Even so, leaving ST does not automatically mean the turnaround is secure.

Whether a firm can recover sustainably may not depend on these external shocks per se, but rather on what the firm did when it was under stress and whether its recovery measures could actually be carried out (Li et al., 2021). As a result, recovery is more represented by an internal decision-making and implementation procedure instead of an automatic bounce due to the improvement in the macroeconomic condition (Li et al., 2021; Jing et al., 2024).

Corporate governance offers a useful lens for understanding why recovery trajectories differ across firms (Li et al., 2021). From the agency view, effective internal governance and control systems mitigate the conflict of interests, limit opportunism and enhance accountability (Maizatul et al., 2016). Good governance improves decision discipline, monitoring, and the credibility of managers' decisions (Li et al., 2021). As a consequence, the plans for recovery are more likely to provide a better opportunity for translating strategic intent into visible, verifiable, and enforceable action than symbolic change.

Based on this logic, this study focused on listed manufacturing firms in China that had exited the ST status, referred to here as "ST-recovered firms." It examined whether corporate governance mechanisms in these manufacturing firms were correlated with their recovery performance. This paper defined recovery from three different perspectives: profitability restoration (Return on Assets (ROA) and Return on Equity (ROE)), financial resilience (ZChina-score), and market confidence (Tobin's Q).

Against this backdrop, this study had several implications for stakeholders concerned with post-distress recovery among listed firms. For regulatory purposes, exiting the ST status does not necessarily mean that the firm will achieve a lasting recovery. After the firm returns to the non-ST state, the quality of governance remained an important factor in strengthening financial resilience and rebuilding market trust. Building on this concern, for boards and managers of firms, improving the overall governance mechanism is more conducive to restoring profits and achieving financial resilience than relying solely on symbolic board characteristics. At the same time, market confidence suggests that more "visible" governance signals (such as board diversity) may influence investors' short-term confidence in the early stages of recovery. For investors and creditors, this paper provides a more detailed assessment perspective, namely that, when judging the sustainability of the recovery, it is necessary to distinguish between profitability restoration and market confidence. Overall, this study helps to form a more policy-relevant and practice-oriented framework for understanding corporate governance and to explain how governance functions in the recovery context.

2. LITERATURE REVIEW

2.1 Governance Mechanism

Corporate governance, as an internal mechanism, is widely used to explain firm performance, risks, and the adjustment process aftershocks (Klarner et al., 2023). In relevant literature, governance is typically measured by the characteristics of the board structure, especially female directors and independent directors (Long et al., 2024). In recent years, scholars have also begun to use more comprehensive governance quality indicators, such as the governance dimension (G score) in Environmental, Social, and Governance (ESG) (Hsiao et al., 2022). Although these proxy variables are widely used in empirical research, the research conclusions still show significant differences and are highly context-dependent (Mishra, 2023; Tubik & Herberger, 2026). This inconsistency is particularly prominent in the context of crisis recovery, as firms not only need to repair their operational fundamentals but also must rebuild external credibility (Kuzey et al., 2023).

2.2 The Agency Theory and Governance Mechanisms in the Recovery Phase

Although corporate governance has been extensively studied during periods of normal firm operations, its effects may not mechanically persist during the post-financial distress recovery phase. This study adopted the Agency Theory as an analytical lens to organise and interpret related empirical evidence. Once a firm falls into financial distress, agency conflicts tend to intensify (Kuzey et al., 2023). As default risks escalate and operating performance deteriorates, management may postpone loss recognition or commit to higher-risk projects in an attempt to reverse unfavourable conditions through a "gamble for resurrection" (Jing et al., 2024; Bai et al., 2024). Apart from the issues mentioned above, financial distress may also lead to damage to a firm's reputation, increased information asymmetry, higher capital costs, and weakened external support (Kuzey et al., 2023; Akin & Akin, 2025). From this perspective, corporate governance is crucial for a firm's recovery because it can enhance supervision and accountability, curb opportunistic behavior, and improve the credibility of management actions through higher quality financial disclosure and stricter reporting discipline (Alam et al., 2019; Yin et al., 2025; Huang et al., 2025). In the context of China's ST system, these governance mechanisms are particularly important. Even if a manufacturing has exited from the ST status, the recovery process still involves high execution risks. A more reasonable expectation is that truly effective improvements need to be continuously demonstrated in subsequent operations rather than through one-off "quick fixes".

2.3 Governance Mechanisms in Recovery Outcomes

Against this backdrop, empirical studies on governance mechanisms and distress recovery show mixed results. One strand focuses on board gender diversity. Research in China suggests female directors can positively affect organisational outcomes (Long et al., 2024), but other studies find conditional or negative effects depending on ownership and governance context (Muien et al., 2024). Overall, gender diversity enhances supervision, yet this does not consistently translate into performance recovery.

The second strand examines independent directors. They are seen as curbing managerial entrenchment and improving board oversight. Crisis evidence shows they can help firms resume operations by promoting cautious decisions (Chen et al., 2021). However, many studies find insignificant or even negative effects on profitability, partly because some appointments are compliance-driven rather than capability-based, and independent directors often lack firm-specific knowledge, making their "formal independence" ineffective (Mishra, 2023). Thus, board structure matters but is context-dependent; independent directors do not guarantee stronger recovery.

Given this, recent research has shifted toward richer firm-level governance quality indicators. Systemic capabilities (internal control, risk management, compliance, disclosure discipline) better reflect a firm's ability to implement recovery measures. Higher governance quality and ESG performance are linked to greater resilience, though the relationship varies with market conditions (Hsiao et al., 2022). Improving transparency and disclosure quality enhances information environments and reduces financing frictions, which are crucial for post-crisis reputation and external support (Huang et al., 2025). Mandatory ESG disclosure is associated with higher earnings quality and lower capital costs, helping restore investor and creditor confidence (Akin & Akin, 2025). Overall, comprehensive governance measurement (e.g., G score) is especially important in the recovery stage, as successful turnaround depends on sustained governance execution and operational improvement.

2.4 Research Gap and Hypotheses Development

Despite growing evidence on corporate governance and firm performance, four gaps remain in the governance–recovery literature. First, most studies have examined governance effects using broad samples of non-distressed firms or mixed firm conditions. Evidence specific to ST-recovery firms remains limited. As a result, it is likely that relatively little is known about how governance operates after firms exit distress but still face a high risk of relapse.

Second, existing studies often conceptualise "performance" as a single outcome variable. However, post-distress corporate recovery is inherently multidimensional. Metrics such as profitability restoration (ROA/ROE), financial resilience (ZChina-score), and market confidence (Tobin's Q) are likely to respond through distinct mechanisms and across varying timeframes. Nonetheless, few studies have simultaneously examined these dimensions within a unified research framework, which may partially account for the inconsistent or contradictory conclusions observed in the literature.

Thirdly, the existing evidence usually relies on a single corporate governance proxy variable (such as female directors or independent directors). However, board characteristics have a strong context dependence and may not be sufficient to fully reflect the overall governance strength of a firm. Comprehensive governance indicators such as ESG governance pillar scores (G score), especially in the context of firm recovery, are rarely jointly analysed with board structure variables in the same model. Therefore, it is still unclear whether recovery performance is mainly driven by overall governance quality or is more dependent on certain specific board attributes.

Finally, at the methodological level, existing studies have rarely addressed the dual issues of performance persistence and endogeneity in the analysis of financial performance during the recovery period, which may introduce bias in the estimation of corporate governance effects. To address these gaps, this study focused on ST exiting firms and employed empirical approaches that explicitly accounted for dynamic persistence and endogeneity to examine the relationship between corporate governance and three types of recovery outcomes: profitability restoration, financial resilience, and market confidence. Firm age and political connection were included as control variables. Accordingly, Figure 1 summarises the conceptual framework. Based on this framework, this study proposed the following hypotheses.

H1a: Corporate governance (female director, independent director and G score) is associated with profitability restoration (ROA and ROE) among ST-recovery firms.

H1b: Corporate governance (female director, independent director and G score) is associated with financial resilience (ZChina-score) among ST-recovery firms.

H1c: Corporate governance (female director, independent director and G score) is associated with market confidence (Tobin's Q) among ST-recovery firms.

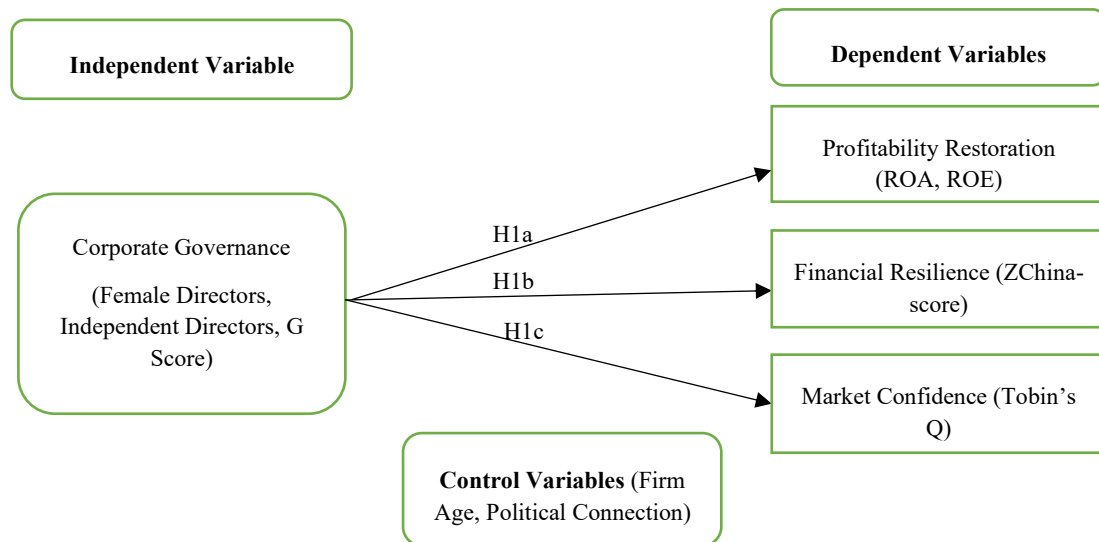


Figure 1. Conceptual Framework

3. METHODOLOGY

3.1 Sample and Data Sources

This study examined Chinese ST-recovery firms in the manufacturing sector. The sample comprised 182 A-share manufacturing firms that were designated as ST due to financial distress during 2009–2023 and subsequently exited ST status. To ensure that recovery performance was assessed within a more stable post-exit period, this study retained only firms that remained non-ST for at least three consecutive years after the exit. When defining recovery after a period of distress, this study followed the previous practice of classifying a firm as an ST-recovery firm only if it remained in a non-ST status for three consecutive years after being removed from the ST list. This standard was designed to characterise a relatively stable recovery state and mitigate misjudgements arising from short-term performance improvements following the exit of ST status by the firm. Therefore, a multi-year observation period was helpful in distinguishing between persistent adjustments and temporary rebounds. Additionally, the firm identification information and ST exit information were sourced from the East money Choice database. The financial statement data and firm-level characteristic variables were taken from the China Stock Market and Accounting Research (CSMAR) database, which is a commonly used data source for researching listed firms in China. Where applicable, this study also used the Wind database to supplement and cross-check some market and accounting items. Finally, this study excludes financial firms and sample observations with missing key

estimated variables. To reduce the influence of outliers, continuous variables were winsorized at the 1% and 99% percentiles. The final sample used for estimation was an unbalanced panel dataset.

3.2 Variable Measurement

Consistent with the conceptual framework developed above, the dependent variables captured three dimensions of recovery performance (profitability restoration, financial resilience, and market confidence). The key independent variables proxy corporate governance used female directors, independent directors, and the G score (see Appendix Table A), while firm age and political connection were included as controls. Detailed definitions and constructions are provided in Table 1.

Table 1. Description of Variables

Variable	Definition	Measurement
ROA	Measures a firm's efficiency to generate profit from its assets.	$ROA = \text{Net Income} / \text{Total Assets}$
ROE	Indicates how effectively a firm uses its equity to generate profit.	$ROE = \text{Net Income} / \text{Shareholder's Equity}$
Tobin's Q	Provides an assessment of market valuation relative to asset replacement costs.	$\text{Tobin's Q} = \text{Market Value of Firm} / \text{Replacement Cost of Assets}$
ZChina-score	A country-specific version of the Altman Z-score, used to predict financial distress.	$Z\text{China-score} = 6.56 \times \text{Working Capital} / \text{Total Assets} + 3.26 \times \text{Retained Earnings} / \text{Total Assets} + 6.72 \times \text{EBIT} / \text{Total Assets} + 1.05 \times \text{Market Value of Equity} / \text{Total Liabilities}$
Female Director	Proportion of female directors as a percentage of the total number of board members.	$\text{Female Director} = \text{Number of Female Directors} / \text{Total Number of board members}$
Independent Director	Proportion of independent directors to the total number of board members.	$\text{Independent Director} = \text{Number of Independent Directors} / \text{Total Number of board members}$
G Score	G score provided by the Sino-Securities Index Information Services (Shanghai) Co., Ltd.	Selecting Governance (G) indicators mainly includes Governance structure, Information disclosure, and Operational risk.
Firm Age	The number of years since the firm's establishment.	$\text{Firm Age} = \text{Year of Analysis} - \text{Year of Establishment}$
Political Connection	A dummy variable indicating whether the firm's top executives have political affiliations.	Political Connection = 1 if political affiliation exists, 0 otherwise

Source: Authors' own work.

3.3 Analytical Approach

To examine how corporate governance was related to recovery performance among ST-recovery firms, the study estimated four dynamic panel model specifications as formalised in Equations 1–4.

$$ROA_{it} = \alpha + \beta_1 ROA_{it-1} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Firm Age}_{it} + \beta_4 \text{Political Connection}_{it} + \epsilon_{it} \quad (1)$$

$$ROE_{it} = \alpha + \beta_1 ROE_{it-1} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Firm Age}_{it} + \beta_4 \text{Political Connection}_{it} + \epsilon_{it} \quad (2)$$

$$\text{Tobin's } Q_{it} = \alpha + \beta_1 \text{Tobin's } Q_{it-1} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Firm Age}_{it} + \beta_4 \text{Political Connection}_{it} + \epsilon_{it} \quad (3)$$

$$\text{ZChina-score}_{it} = \alpha + \beta_1 \text{ZChina-score}_{it-1} + \beta_2 \text{Corporate Governance}_{it} + \beta_3 \text{Firm Age}_{it} + \beta_4 \text{Political Connection}_{it} + \epsilon_{it} \quad (4)$$

Here, ROA_{it} , ROE_{it} , Tobin's Q_{it} , and $Z\text{China-score}_{it}$ represented the financial performance of firm i at time t ; ROA_{it-1} , ROE_{it-1} , Tobin's Q_{it-1} , and $Z\text{China-score}_{it-1}$ were the lagged financial performance indicators; $\text{Corporate Governance}_{it}$, firm age_{it} , and $\text{political connection}_{it}$ were the independent and control variables; and ϵ_{it} was the error term. In addition, $\text{Corporate Governance}$ included FemaleDirector , $\text{IndependentDirector}$, and GScore .

This study employed the two-step system generalised method of moments (GMM) estimator as the baseline approach to address endogeneity in the four dynamic panel specifications, including potential reverse causality and omitted-variable bias (Blundell & Bond, 1998; Arellano & Bond, 1991). Each model included the lagged dependent variable to capture persistence in recovery performance. Time-invariant firm effects were removed within the GMM transformation, and year fixed effects (FE) were included to absorb common macro shocks. To improve inference under the finite-sample issues often associated with efficient two-step GMM, this study reported finite-sample corrected standard errors and followed recent discussions on variance estimation in two-step GMM (Hwang & Valdés, 2023).

Endogeneity was further mitigated by using internal instruments with a restricted and collapsed instrument set to limit instrument proliferation. Model validity was assessed using standard post-estimation diagnostics, including the Arellano–Bond tests for serial correlation and the Hansen test of over-identifying restrictions (Arellano & Bond, 1991; Roodman, 2009). As robustness checks, the study also estimated firm-level FE regressions and interpreted these results as comparative benchmarks.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

As summarised in Table 2 the ST recovery samples, showed that the average profitability of the sample firms was relatively weak: the mean ROA was -0.0023, and the mean ROE is -0.0623, both exhibiting high dispersion and a pronounced negative long-tail distribution. In contrast, the average market confidence was higher (the mean Tobin's Q is 2.48), but the volatility was very strong (the maximum value reaches 121.48), which was consistent with the significant heterogeneity of investor expectations during the recovery stage. Financial resilience also varied significantly: the mean ZChina-score was 0.10, with a range of values from -29.23 to 6.92. In terms of governance, female directors accounted for 12.9% on average, independent directors for 37.3%, and the mean G Score is 76.70; political connections were prevalent (mean 0.91). Multicollinearity appeared negligible, with VIFs close to 1.

Table 2. Descriptive Statistics of Variables for ST-recovery firms

Variable	Obs	Mean	Std. dev.	Min	Max	VIF
ROA	2245	-0.0023166	0.1242091	-2.6464610	0.7858650	
ROE	2245	-0.0622620	0.8926055	-31.0623300	2.3851100	
Tobin's Q	2231	2.4846450	4.8289950	0.1125392	121.4825000	
ZChina-score	2245	0.1042773	1.9997570	-29.2303400	6.9208410	
Female director	2245	0.1287898	0.1216179	0.0000000	0.8000000	1.02
Independent director	2245	0.3727603	0.0558993	0.0000000	0.6666667	1.00
G Score	2245	76.6963100	7.2524070	39.7900000	91.2300000	1.04
Political Connection	2245	0.9064588	0.2912542	0.0000000	1.0000000	1.01
Firm Age	2245	17.3955500	6.3383070	0.0000000	33.0000000	1.06

Source: Authors' own work.

Table 3 presents the descriptive correlation results and revealed several characteristics pertinent to subsequent analyses. Profitability indicators exhibited a high degree of synchronisation with financial resilience metrics: a strong positive correlation was observed between ROA and ROE, and both metrics were highly consistent with the ZChina-score. In contrast, Tobin's Q demonstrated a relatively weak correlation with contemporaneous accounting profitability, appearing largely decoupled, and exhibited a negative correlation with the ZChina-score.

The pairwise correlations between corporate governance variables and various performance outcomes, as well as among the governance variables themselves, were generally relatively mild. Among them, the G score showed the most systematic positive correlation with profitability and financial resilience. Overall, the correlation structure did not indicate serious multicollinearity issues, thereby providing support for the multivariate regression settings in subsequent models.

Table 3. Correlation Matrix of ST-recovery firms

Variables	ROA	ROE	Tobin's Q	ZChina-score	Female Director	Independent Director	G Score	Firm Age
ROA	1							
ROE	0.744***	1						
Tobin's Q	0.002	0.010	1					
ZChina-score	0.822***	0.625***	-0.242***	1				
Female Director	0.029	0.008	0.046**	0.027	1			
Independent Director	-0.048**	-0.043**	0.040*	-0.055***	0.003	1		
G Score	0.164***	0.145***	-0.071***	0.243***	-0.047**	0.023	1	
Firm Age	0.050**	0.026	0.064***	-0.058***	0.136***	0.049**	-0.189***	1
Political Connection	0.032	0.007	-0.055***	0.034	-0.037*	-0.026	0.010	-0.081***

*, **, *** denote significance at the 10%, 5%, and 1% levels, respectively.

Source: Authors' own work.

4.2 Regression Results

To address this gap in the post-ST recovery literature, Table 4 reports two-step system GMM estimates with year FE for ST-recovery firms across multiple recovery dimensions. The coefficients of the lagged dependent variables were both positive and significantly non-zero in the models of Tobin's Q (0.8234) and ZChina-score (0.7138), indicating that market confidence and financial resilience had obvious dynamic persistence, that is, the level of the previous period will significantly affect the performance of the current period.

The G score was the most systematic and stable governance-related indicator; it was significantly positively correlated with ROA (0.0092), ROE (0.0388), and ZChina-score (0.1032), but significantly negatively correlated with Tobin's Q (-0.0718). This indicated that improvements in governance quality at the system level tended to occur concurrently with the restoration of profitability and the enhancement of financial stability, but not necessarily with a simultaneous boost in investor confidence during the same period.

Specifically, in terms of board characteristics, the proportion of female directors on the board was significantly positively correlated with Tobin's Q (4.2676), while the proportion of independent directors is significantly positively correlated with ROE (4.3689). Political connections showed a weakly positive relationship with Tobin's Q (1.0359) but did not manifest a clear correlation with accounting-based profitability or financial resilience. In addition, the validity of the two-step system GMM specification, supported by diagnostic test: the Hansen test did not reject the validity of the instruments, and the AR(2) test was insignificant, satisfying the required moment conditions.

Table 4: GMM Regression of four models in the ST-recovery firm

Variable	ROA (1)	ROE (2)	Tobin's Q (3)	ZChina -score (4)
L.ROA	0.4182 (0.3806)			
L.ROE		0.4429 (0.3748)		
L.Tobin's Q			0.8234*** (0.0555)	
L.ZChina-score				0.7138*** (0.0989)
Female Director	0.0322 (0.2792)	-0.5596 (1.4839)	4.2676*** (1.6353)	-0.546 (1.4504)
Independent Director	-0.2714 (0.8788)	4.3689*** (1.6293)	-1.8569 (3.7651)	-2.6424 (3.2165)
G Score	0.0092*** (0.0032)	0.0388** (0.0178)	-0.0718*** (0.0275)	0.1032*** (0.0252)
Firm Age	-0.0162 (0.0130)	0.0001 (0.0445)	0.0184 (0.0148)	-0.0090 (0.0117)
Political Connection	0.1786 (0.1489)	0.1369 (0.1550)	1.0359* (0.5346)	0.6094 (0.5822)
Year control	Yes	Yes	Yes	Yes
_cons	-0.3792 (0.4573)	-4.7278*** (1.5528)	4.4011** (2.1775)	-7.1873*** (2.2926)
No. of Instruments	35	47	97	70
No. of Groups	174	175	180	175

Variable	ROA (1)	ROE (2)	Tobin's Q (3)	ZChina -score (4)
No. of Obs.	998	1116	1533	1116
Hansen p	0.8231	0.9209	0.8547	0.7488
ar1p	0.0457	0.0064	0.0000	0.0000
ar2p	0.9877	0.2492	0.4485	0.2160

Notes: Standard errors are reported in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. Lagged levels are used as instruments for the differenced equation, and lagged differences are used as instruments for the level equation. The lag window is set as follows: ROA, lag (2 4); ROE, lag (2 5); TQ, lag (3 4); and ZChina-score, lag (3 5).

Source: Authors' own work.

4.3 Robustness Check Results

As a robustness benchmark, Table 5 reports the results of the firm FE regression including annual fixed effects. The lagged dependent variable was positive and statistically significant in all models (ROA: 0.4746; ROE: 0.1539; Tobin's Q: 0.5882; ZChina-score: 0.6255), indicating that the outcome variables of ST-recovery firms showed obvious persistence after exiting the ST status.

Table 5: FE Regression of four models in ST-recovery firm

Variable	ROA (1)	ROE (2)	Tobin's Q (3)	ZChina-score (4)
L.ROA	0.4746*** (0.0565)			
L.ROE		0.1539** (0.0758)		
L.Tobin's Q			0.5882*** (0.0465)	
L.ZChina-score				0.6255*** (0.0512)
Female Director	-0.0038 (0.0229)	-0.1756* (0.0899)	-0.7076* (0.3882)	-0.0260 (0.2970)
Independent Director	0.0608	-0.0339	0.1166	0.6812

Variable	ROA (1)	ROE (2)	Tobin's Q (3)	ZChina-score (4)
	(0.0499)	(0.2390)	(0.7647)	(0.6291)
G Score	0.0007	0.0061***	-0.0176***	0.0098*
	(0.0005)	(0.0018)	(0.0058)	(0.0051)
Firm Age	-0.0022***	-0.0053**	-0.0317***	-0.0342***
	(0.0006)	(0.0023)	(0.0117)	(0.0076)
Political Connection	-0.0099	-0.0781*	-0.0237	-0.1364
	(0.0088)	(0.0415)	(0.1440)	(0.1112)
Year control	Yes	Yes	Yes	Yes
_cons	-0.0235	-0.2795	2.8891***	-0.2062
	(0.0462)	(0.1854)	(0.6384)	(0.5220)

Note: Standard errors are reported in parentheses. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. For all of the models total number of observations is 1882.

Source: Authors' own work

In terms of corporate governance variables, the FE estimation showed a more "selective" feature. The comprehensive governance index (G score) was positively correlated with ROE (0.0061) and ZChina-score (0.0098), but significantly negatively correlated with Tobin's Q (-0.0176), and was not statistically significant in the ROA model.

For board characteristics, the results were mixed and less stable, with sign changes relative to the two-step system GMM estimates. In particular, female director representation was negatively associated with ROE (-0.1756) and Tobin's Q (-0.7076), while it was not statistically significant for ROA or the ZChina-score. Independent director was statistically insignificant across all four outcomes in the FE models.

Relative to the two-step system GMM results, the FE estimates differed in both magnitude and significance for several governance proxies. This divergence was plausible because governance adjustments during recovery may be endogenous to restructuring and financing conditions (Schweizer & Nienhaus, 2017). In this setting, system GMM was better suited to accommodate dynamic persistence and mitigate endogeneity using internal instruments. Together with the post-estimation diagnostics, therefore, this study treated the GMM estimates as the primary evidence and used FE results as robustness benchmarks.

5. DISCUSSION

Building on the results above, this section explains how different governance mechanisms relate to three dimensions of ST recovery: profitability restoration, financial resilience and market confidence.

Across the main specifications, corporate governance was positively associated with profitability (ROA/ROE) and financial resilience (ZChina-score). Although the independent director was also positively related to ROE, the G score was the most consistent governance measure linked to recovery performance. Higher governance quality was associated with stronger accounting performance and greater financial resilience, which is consistent with evidence that governance is informative about firms' financial condition and distress risk (Li et al., 2021; Alam et al., 2022). This was also logical in the recovery period, where information opacity and financing frictions often persist. In such a context, governance may mainly function through credibility, transparency, and improving access to external funds (Kuzey et al., 2023). Overall, the baseline results were consistent with H1a and H1b.

The evidence regarding market confidence (H1c) was relatively less clear. In the results of the system GMM, the coefficient of the G score on Tobin's Q was negative and significantly correlated; while the proportion of female directors was significantly positively correlated with Tobin's Q. The conclusions of existing studies on the relationship between female directors and firm value were inconsistent and have obvious context dependence, which implies that market responses may vary under other institutional arrangements or over a longer time span (Long et al., 2024). This study also found that political connections were significantly positively correlated with Tobin's Q, which is consistent with the view in the relevant literature that political ties may bring certain value when information is opaque or other constraints exist (Hu et al., 2019). As for the negative correlation between the G score and Tobin's Q, apart from the explanations mentioned earlier, this study also proposes two possible reasons. First, investors may still be sceptical of firms that have just emerged from difficulties, thus interpreting governance improvement as a kind of "signal display" rather than a manifestation of genuine capability enhancement. Second, governance improvements often come with short-term adjustment costs and compliance expenditures, and the market may capitalise these costs in advance in the price before observing their long-term benefits (Kuzey et al., 2023; Akin & Akin, 2025). Overall, these benchmark regression results provided some support for H1c, but the support was relatively limited.

In combination with the Agency Theory, these findings are consistent with the view that "financial distress will amplify agency conflicts and information asymmetry". Therefore, governance at the system level and disclosure discipline are particularly crucial for enhancing the credibility of execution and strengthening resilience after recovery. At the same time, the differences in valuation responses corresponding to different governance proxy variables also suggest that there are two relatively different channels of "execution (profitability restoration; financial resilience)" and "investor cognition (Market Confidence)" during the recovery stage.

The discrepancy between the FE benchmark results and the system GMM estimates also indicated that this study needs to take into account both the endogeneity issue and the dynamic characteristics of the variables simultaneously. During the recovery stage, changes in corporate governance often occur concurrently with factors such as restructuring activities and financing conditions, making it more difficult to provide a clear interpretation of the reduced-form correlations. Recent methodological studies have shown that the choice of estimators in dynamic performance models can affect inference results (Cave et al., 2023), and a review study on the relationship between boards and performance has also emphasised the issue of endogeneity and had pointed out that this is precisely the important motivation for adopting dynamic identification strategies (Tubik & Herberger, 2026).

Overall, the corporate governance of ST-recovery firms did not function through a singular mechanism. A comprehensive governance quality demonstrated a more stable and consistent association with the remediation of profitability and financial resilience. In contrast, market confidence tended to respond more readily in the short term to visible governance signals and institutional characteristics. This also helps elucidate the frequent inconsistencies observed in existing research findings: the effects of corporate governance in post-financial distress recovery contexts vary depending on the specific dimension of recovery examined, as well as on the methodologies employed to account for dynamic attributes and endogeneity (Klarner et al., 2023).

This study also offers practical implications for key stakeholders involved in the recovery process. For regulatory authorities, the findings suggest that a firm's exit from ST status does not equate to achieving stable and long-term successful recovery. Corporate governance quality remains a key foundational factor requiring continuous monitoring. By assessing governance standards, regulators can more effectively identify firms undergoing "precarious exits," thereby reducing the risk of re-entering financial distress. For boards of directors and management, the study underscores that strengthening firm-level governance structures is essential to enhancing sustainable profitability and financial resilience. At the same time, the research also revealed that, within a short time window, more "visible" signals of board governance may influence market sentiment: reinforcing external confidence in the firm's executive capacity and partially alleviating financing frictions (Kuzey et al., 2023). For investors and creditors, the findings highlighted the importance of distinguishing between two types of outcomes when evaluating the "quality" of economic or corporate recovery: one pertains to profitability and financial resilience, and the other to valuation recovery. These two dimensions do not necessarily evolve in tandem. Moreover, governance-related information should be leveraged to differentiate between sustainable corporate turnarounds and fragile recoveries, thereby supporting more effective screening, pricing, and capital allocation decisions.

6. CONCLUSION

This study demonstrated that corporate governance remains important during the recovery phase of firms, but its impact is not uniform across all outcomes. The relationship between overall governance quality (G score) and profitability and financial resilience is more stable, while market confidence is more sensitive to more visible governance characteristics and institutional signals. In summary, recovery is multi-dimensional, and the speed of profit adjustment and market valuation adjustment may not be synchronised.

The contributions of this study are mainly reflected in three aspects. First, in the research context, this study focused on the recovery stage of ST exit in China's listed manufacturing, which is characterised by significant institutional constraints and high uncertainty. It extends the relationship between corporate governance and performance from the "normal operation sample" to the "recovery sample after exit from distress", addressing the issue of insufficient extrapolation of existing evidence in the recovery context. Second, in terms of the research framework, this study defined recovery as a three-dimensional performance of profit restoration (ROA/ROE), financial resilience (ZChina-score), and market confidence (Tobin's Q), avoiding simplifying recovery to a single indicator and thus more precisely depicting the differences in the quality and sustainability of recovery after ST exit. Third, in terms of theoretical and practical significance, this study, in combination with the Agency Theory, revealed that governance mechanisms may simultaneously play a role through two paths in the recovery period: "execution " and "investor ", providing

more targeted references for regulatory authorities to identify "vulnerable ST removal", for boards and management to enhance governance and disclosure discipline, and for investors to distinguish between "profitability and financial resilience " and "valuation".

A key limitation is that, although year effects were included, it cannot fully rule out time-varying omitted factors that shape recovery. Future research could examine longer-term recovery trajectories after ST exit and assess whether governance effects on market valuation materialise over a longer horizon. Further analysis could examine heterogeneity by firm scale, ownership structure and the severity and duration of financial distress prior to ST removal. Subject to data availability, future studies could incorporate macroeconomic indicators and more industry-level shock variables to more comprehensively capture the impact of exogenous factors on the recovery phase, thereby enhancing the explanatory power of the overall model for the recovery process.

7. ACKNOWLEDGEMENTS/FUNDING

We thank the editor and two anonymous reviewers for their constructive feedback and valuable suggestions, which substantially improved the quality of this work. All individuals acknowledged here have given their consent. The authors declare no competing interests.

8. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

9. AUTHORS' CONTRIBUTIONS

Jinyu Xiao designed the study, collected and analysed the data, and wrote the manuscript. **Md. Mahmudul Alam** provided overall supervision, contributed to the development of the research framework, and offered critical guidance in refining the analysis and interpretation. **Shazida Jan Mohd Khan** contributed to conceptual discussions and provided comments on manuscript. All authors read and approved the final manuscript.

10. DATA AVAILABILITY/SUPPLEMENTARY MATERIALS

The datasets used in this study were obtained from the CSMAR and Wind databases. These are subscription-based commercial databases and are therefore not publicly available. However, the datasets are available from the corresponding author on reasonable request and with permission from the data providers.

11. ETHICS STATEMENT

The authors declare that this research did not involve human or animal subjects.

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13. APPENDIX

A. Sino-Securities Index Governance pillar (G score)

Organising dimension	Governance themes covered	Illustrative key issues
Governance structure	Shareholders' interests; Governance structure	Shareholder rights protection; ESG governance and risk control; board structure; management stability
Information disclosure	Quality of information disclosure	ESG external assurance; disclosure credibility
Operational risk	Governance risk; External punishment; Business ethics	Major shareholder behaviour; solvency; legal litigation; tax transparency; external punishment; anti-corruption and bribery

Source: Authors' own work.