



Examining the Factors of Corporate Frauds in Chinese A-share Listed Enterprises

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Abstract

Using data from Chinese A-share listed enterprises from 2007 to 2023, this study employs a two-way fixed effects model to examine the effects of internal control quality, CEO duality, ownership concentration, and financial distress on corporate fraud. The benchmark results indicate that higher internal control quality mitigates the risk of corporate fraud, while CEO duality, ownership concentration, and financial distress increase this risk. Robustness checks utilizing lagged variables confirm these findings. Heterogeneity analysis reveals that in highly leveraged firms, CEO duality and ownership concentration significantly increase fraud risk, whereas internal control quality reduces this risk. In low-leveraged firms, internal control quality reduces fraud, and CEO duality and financial distress increase fraud risk. Analysis based on business cycle heterogeneity shows the importance of robust internal controls in both fast and slow cycles, with varied effects of CEO duality and ownership concentration. Industry analysis indicates that internal controls are crucial in both heavily and less polluted industries, with ownership concentration and financial distress having significant impacts in less polluted sectors. Policymakers should mandate stricter internal control requirements and regular audits to ensure compliance and effectiveness.

Keywords

Corporate fraud, Internal control quality, CEO duality, Ownership concentration, Financial distress

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1. Introduction

Corporate financial fraud is a major concern in the modern business environment, that undermines investor confidence, disrupts market operations, and results in economic and reputational losses for enterprises. The fraud triangle theory suggests that various pressures, opportunities, and rationalizations tend to cause financial fraud (Cressey Donald, 1953). Firms engage in fraudulent activities to present their more favorable image for attracting investments, and to satisfy the shareholders (Dechow, Ge, Larson, & Sloan, 2011). The lack of a stringent regulatory framework, complex corporate structure, and ineffective governance mechanisms provide strong grounds to managers for financial fraud (Zhou & Kapoor, 2011). China's corporate sector has a significant contribution toward the national GDP and global supply chain, so any financial fraud in this sector could disrupt global supply chain operations. Therefore, in the context of Chinese-A share-listed enterprises, it is essential to understand the factors, leading to financial fraud. Due to rapid economic development, evolving regulatory framework, and state influence in the Chinese market, it is critical to uncover the un-

derlying causes of corporate financial frauds (L. Chen & Lin, 2007; Lennox & Pittman, 2008).

The negative consequences of financial fraud can lead to the collapse of the company's stock price, put the corporation at risk of litigation, and cause investors to suffer huge losses (Firth, Rui, & Wu, 2011; Hilal, Gadsden, & Yawney, 2022; Kerr & Murthy, 2013; D. Kong, Xiang, Zhang, & Lu, 2019; Palmrose, Richardson, & Scholz, 2004). Therefore, curbing these frauds is a hot and emerging issue among academicians and policymakers (Su, Feng, & Tang, 2021). There is an immense literature examining the key factors of financial fraud: motivation, opportunity, and pretext, collectively known as the "fraud triangle theory." Motivation factors include enterprise growth rate, financing demand, and incentives for managers (T. Kong, Sun, Sun, & Song, 2022; Y. Sun, Sun, & Wu, 2021; Suyanto, 2009), opportunity factors include internal control quality and corporate governance structure (Kuang & Lee, 2017; Wang, Yu, & Gao, 2022; Xu, Zhang, & Chen, 2018), and pretext factors influence managers' attitudes towards financial fraud, such as the morality and values of management (Ho, Li, Tam, & Zhang, 2015; N. Sun, Salama, Hussainey, & Habbash, 2010). Essentially, the major cause of repeated occurrence of corporate financial fraud is ineffective internal control quality. External investors and financial institutions lack information to evaluate the business ability and financial situation of enterprises beyond financial statements (Cumming, Hou, & Lee, 2016; Kuang & Lee, 2017). Corporate managers with information are able to exploit financing, salary, and stock price stabilization through financial fraud (Gam, Gupta, Im, & Shin, 2021). Most of the previous studies are based on consequences of the financial fraud, and only a few have shown the factors that result in financial fraud. This study is based on examining the factors that could influence corporate fraud.

Based on the above discussion, there are four most critical factors that could contribute the financial fraud within enterprises such as internal control system quality, CEO duality, ownership concentration, and corporate financial distress. Firms with strong internal control quality mitigate fraud risks by ensuring rigorous financial reporting and compliance with regulations, posed by local governments and regulatory agencies (Krishnan, 2005). On the other hand, a weak internal control system provides grounds for fraudulent activities due to not having strict requirements for managers and executives to comply with (Hogan, Rezaee, Riley Jr, & Velury, 2008). CEO duality, where the CEO also serves as the board chairperson, can influence the matters of corporate governance. CEO duality is a concentration of power that could result in insufficient checks and balances and increases the risks of fraudulent activities (Daily & Dalton, 1994; Jensen, 1993). Prior studies show that CEO duality significantly contributes to fraud, as it tends to shape less effective oversight (Dey, 2008; Larcker, Richardson, & Tuna, 2007). Advances in data analytics, such as GANs, have enhanced internal controls by improving data accuracy and offering new tools to prevent financial fraud (Xiong, Zhang, Wang, & Zhou, 2022). Moreover, research increasingly shows that financial deepening significantly impacts corporate governance, particularly in certain economic systems, where it may elevate the risk of corporate fraud due to the increased opportunities for financial manipulation (Qiu, 2017; Qiu, 2019). High ownership concentration results in entrenchment, where major shareholders prioritize their personal gains over the company's interests, and thus facilitate an environment for corporate fraud (Shleifer & Vishny, 1997). This scenario could be more prevalent in Chinese enterprises where state or family-owned enterprises are common, and this could lead to conflicts of interest and misuse of power (Fan & Wong, 2002). Moreover, financial distress posits significant pressure on managers who could be engaged in fraudulent activities, and require immediate measures to hide poor performance and avoid bankruptcy risks (Beneish, 1999; Jones, 1991). This pressure drives managers to manipulate financial statements so they can avoid losing the trust of shareholders (DeFond & Jiambalvo, 1991; Rosner, 2003).

Fraud triangle theory and agency theory ground the theoretical framework to explain the influence of internal control quality, CEO duality, ownership concentration, and corporate distress on corporate financial frauds. The fraud triangle theory states that there could be pressures, opportunities, and rationalizations, that lead individuals to commit fraud (Cressey Donald, 1953). Agency theory posits that conflicts between managers (agents) and shareholders (principals) push the managers to adopt optimistic practices to cover up the actual financial health and performance of the company (Meckling & Jensen, 1976), thereby resulting in financial fraud. Recent studies suggest that innovative approaches combining deep learning and artificial intelligence can effectively detect and predict fraudulent activities in certain financial systems, contributing to the development of more robust internal control mechanisms (Z. Chen, Fu, & Tang, 2023; Xiong, Chen, & Zhang, 2023). By applying the paradigm of these theories, it is hypothesized that weak internal control, CEO duality, higher ownership concentration, and financial distress lead the firms to be engaged in fraudulent activities (Beasley, Carcello, Hermanson, & Lapides, 2000; Skousen, Smith, & Wright, 2009).

The findings of this study show that internal control quality significantly mitigates the corporate fraud risks in Chinese A-share listed enterprises, which emphasizes the importance of a robust internal control system to deter fraudulent activities. Conversely, the effects of CEO duality, ownership concentration, and financial distress are found positive for corporate financial fraud. These factors exacerbate the corporate fraud risks by either increasing pressure or facilitating

fraud in Chinese A-share listed enterprises. At the same time, the heterogeneity among companies in responding to these factors cannot be overlooked, particularly in those with high financial leverage and unstable business cycles, where the impact on fraudulent behavior is more pronounced. Additionally, this study finds that the heterogeneous effects of these factors are different across firms of different sizes, business cycles, financial leverage levels, and pollution intensity in their respective industries. These findings necessitate significant interventions by policymakers to mitigate the risk of corporate fraud.

The remaining of this paper is structured as follows:

Section (2) covers the literature review to show the findings presented by the previous studies regarding the determinants of corporate fraud, this section also presents a theoretical framework and constructs hypothesis;

Section (3) presents the data, methodology, and empirical modelling of this paper;

Section (4) presents empirical results of descriptive statistics, correlation analysis, benchmark regression, robustness test, and heterogeneity analysis;

Section (5) presents conclusion and policy implications.

2. Literature review, theoretical framework, and hypotheses development

Corporate fraud is remained a pervasive issue that raises serious concerns on the integrity of enterprises and financial markets. It erodes investor confidence, downgrades reputation, and sometimes results in bankruptcy. Despite significant advancements in corporate governance practices and regulatory frameworks, fraudulent activities continue across various regions and industries (Hogan et al., 2008). The dynamic nature of the business environment and complex corporate structure directly contribute to fraud risks. Numerous studies explained the underlying factors of corporate fraud, which range from individual motivations and organizational culture to external pressures and structural weaknesses (L. Chen & Lin, 2007; Zhou & Kapoor, 2011). It is crucial to develop a comprehensive understanding of these factors to allow policymakers and managers to develop effective measures and strengthen overall governance frameworks within organizations. Some studies highlight the significance of internal controls, executive characteristics, ownership structures, and financial conditions to influence fraud risks (Cheng, Dhaliwal, & Zhang, 2013). These factors don't only frame a permissible environment for fraudulent practices but at the same time, they also impact the rationalizations and pressures that could drive those practices. Therefore, a detailed examination of these factors is required to present valuable insights into the determinants of corporate fraud and inform strategies to mitigate its occurrence at any stage (Su et al., 2021; Y. Sun et al., 2021). Recent deep learning-based image recommendation algorithms in social networks demonstrate the potential of large-scale data analysis to detect and prevent fraud, offering new tools for corporate risk management (Du, Chen, Wu, Tang, & Li, 2021). Advances in AI for qualitative data analysis offer new insights into key factors of corporate fraud (Zhao, Yu, Trull, & Shang, 2023). Additionally, new methods for resource optimization and uncertainty management provide valuable guidance for corporate governance in complex environments (Hao, Chen, Jin, & Sun, 2023; Lei, 2022). Previous studies mainly focused on examining the influence of governance and macro-environment factors on corporate fraud and completely ignored the effects of ownership concentration and financial distress with governance. So, realizing this, this study will examine the effects of internal control quality, CEO duality, ownership concentration, and financial distress on corporate frauds in the context of Chinese A-share listed enterprises.

The internal control system consists of the governance, management, and reporting structure of an organization. A robust internal control system can aid firms in preventing fraud by ensuring accurate reporting and regulatory compliance (L. Chen & Lin, 2007). The firms with strong internal control mechanisms could have greater compliance with regulations, and thus report fewer incidents of fraud (Lin, Hutchinson, & Percy, 2015). An effective internal control system reduces opportunities for fraudulent practices and enhances oversight across all management functions, thereby creating a deterrent effect for enterprises (Cheng et al., 2013). Carcello, Hermanson, and Ye (2011) show that companies with stringent internal controls are more transparent in terms of their financial reporting. Ashbaugh-Skaife, Collins, and Kinney Jr (2007) suggest that improving internal control quality hinders fraud risks and improves investor confidence.

Internal controls don't only deter fraud but also foster ethical behavior across all the functions of an organization, which develops a culture of accountability and transparency. This culture is essential to avoid fraud (Hoitash, Hoitash, & Bedard, 2008), and ensuring the compliance of enterprises with regulatory requirements. DeFond and Jiambalvo (1991) found that firms with effective internal control systems experience relatively fewer financial irregularities than those having ineffective internal control systems. A robust internal control system limits managers' ability to manipulate financial reports and thus discourages fraudulent behavior (Ge & McVay, 2005). Additionally, it is argued that investing in an internal control system results in enhanced financial performance and reduced number of fraud incidents (L. Chen & Lin, 2007).

The influence of internal control system quality on corporate fraud can be viewed through the lenses of agency and fraud triangle theories. Agency theory states that conflicts between principals (shareholders) and agents (managers) lead to opportunistic behaviors, which can further result in fraud (Meckling & Jensen, 1976). Similarly, the fraud triangle theory posits that fraud occurs when there is the existence of some pressure, opportunity, and rationalization, and these all enforce an individual to commit fraud (Cressey Donald, 1953). In this context, a robust-internal control reduces the opportunity for fraud by implementing checks and balances that could deter fraudulent practices. Based on these theoretical views and empirical findings, we can develop this hypothesis:

Hypothesis 1: The internal control system negatively influences corporate fraud within Chinese listed enterprises.

CEO duality, which is known as the CEO's dual role as the CEO and as the board chairperson, could have significant implications for corporate fraud in Chinese listed enterprises. CEO duality leads to concentration of power, making the CEO more powerful and dominant to lead the organization, and thus reduces the board's ability to provide effective oversight across all functions of the organization resulting in fraudulent practices (Jensen, 1993). J. Sun, Liu, and Lan (2011) state that CEO duality reduces the control of accounting function, and engages employees in financial misreporting. They argue that fraud incidents are relatively higher in those firms with combined leadership roles, which attributes them to having less rigorous monitoring. There are also studies that show that CEO duality increases the streamlined decision-making processes, which can potentially reduce the likelihood of fraud (Gam et al., 2021).

CEO duality influences the overall governance structure and strengthens/weakens the control mechanisms. It is reported that independent directors and auditors mitigate the adverse effects of CEO duality, and frame an effective governance structure where decisions could be made on the basis of majority and knowledge (Wang et al., 2022). However, when there are fewer or no number of independent directors, CEO duality tends to reduce accountability and increase opportunities for fraudulent activities (Jensen, 1993). Beasley, Hermanson, Carcello, and Neal (2010) show that firms with CEO duality would have a higher likelihood of financial fraud, underscoring the need to mitigate fraud risks through the segregation of power. Agency theory grounds the relationship between CEO duality and corporate fraud. This theory suggests that separating the roles of board chairperson and CEO brings board independence and management effectiveness, which both are mandatory to counteract fraudulent practices. The concentration of power leads to conflicts of interest and reduces oversight, thereby increasing the likelihood of fraud. Drawing on these theoretical views, this hypothesis can be postulated:

Hypothesis 2: CEO duality increases corporate fraud in Chinese A-share listed enterprises.

Ownership concentration, characterized as a high proportion of shareholding owned by a few shareholders, is another substantial factor that could influence corporate financial fraud. High ownership concentration tends to increase entrenchment within organizations and increases the likelihood of fraudulent activities (Skousen et al., 2009). Entrenched owners prefer their personal gains over the interests of minority shareholders, and this leads to conflict of interest and fraudulent practices as well (Claessens, Djankov, & Lang, 2000). La Porta, Lopez-de-Silanes, and Shleifer (1999) found that firms with concentrated ownership structures are more exposed to the risks of financial misreporting. It is also reported that ownership concentration aligns the interests of owners and managers, and reduces agency costs and chances of fraudulent activities (Hameed, 2013). The large shareholding ratio allows the key shareholders to closely monitor the management thereby discouraging fraudulent behavior (Shleifer & Vishny, 2010). The dual effects of ownership concentration underscore the need to understand its impact.

Fan and Wong (2002) indicate that on one side ownership concentration leads to entrenchment, while on the other side, it provides incentives for large shareholders to prevent fraud, and thus balances its overall impact on corporate fraud. Agency theory posits that ownership concentration can either exacerbate or hinder agency conflicts, and this depends on the alignment of interests between managers and owners (Jensen & Meckling, 2019). Entrenchment theory suggests that high ownership concentration leads to entrenchment, where controlling shareholders prefer their own interests over minority shareholders' interests (Morck, Shleifer, & Vishny, 1988). These theoretical and empirical perspectives underscore the need to study the impact of ownership concentration on corporate frauds in the context of Chinese A-share listed enterprises, and we postulate this hypothesis:

Hypothesis 3: Ownership concentration mitigates the likelihood of corporate fraud in Chinese A-share listed enterprises.

Corporate financial distress puts immense pressure on firms and urges them to present a favorable financial outlook, which can lead to manipulative behaviors and fraudulent reporting (Jones, 1991). It is argued that firms under financial distress are more likely to engage in fraudulent practices, aimed at avoiding bankruptcy and securing financing. Rosner (2003) shows that firms, undergoing financial pressures, are more prone to earning manipulation, thereby highlighting the link between financial distress and fraud. Fahlenbrach, Low, and Stulz (2010) found that firms experiencing financial difficulties are under a high pressure to perform accounting misreporting. Financial distress leads the firms to adopt

those measures which can be used to conceal poor performance and secure investor confidence (Dechow et al., 2011). It can be argued that greater financial pressure tends to increase the likelihood of fraudulent activities (Agrawal & Chadha, 2005).

J. Chen, Cumming, Hou, and Lee (2016) state that firms under financial distress are more prone to incidences of financial statement fraud, which underscores the need to understand the impact of financial pressure on fraudulent activities. The fraud triangle theory posits that financial pressure could push managers to engage in fraudulent practices. When firms are under pressure to meet financial obligations and avoid bankruptcy, they engage in fraudulent activities. These theoretical views highlight how financial distress facilitates the environment of corporate fraud, and therefore we postulate this hypothesis:

Hypothesis 4: Financial distress increases the fraudulent activities in Chinese A-share listed enterprises.

3. Method

3.1 Research samples and data sources

This paper examines corporate financial fraud in China's A-share listed companies from 2007 to 2023, using an unbalanced panel dataset of 910 enterprises. Financial corporations, companies marked as ST (Special Treatment), and samples with missing related data have been excluded from the analysis. The data for corporate fraud, internal control quality, CEO duality, ownership concentration, and financial distress is sourced from CSMAR. The enterprise financial data for the control variable also came from CSMAR, and industry classification data was gained from the CSRC industry classification.

3.2 Variables of study

3.2.1 Explained variable: Corporate fraud (Fraud)

Irregularities categorized as “Fictitious assets,” “Fictitious profits,” “False statements,” “Delayed disclosure,” and “Major omissions” in the corporate violation database serve as the financial fraud variables. These variables define the financial fraud indicators (*Fraud*) through the construction of dummy variables. The *Fraud* value is set to “1” if a corporation’s data disclosure exhibits at least one of the aforementioned issues in a given year, and otherwise “0”.

3.2.2 Key explanatory variables

Internal control quality (IC Qty)

It is a dummy variable sourced from the Internal Control database of CSMAR, and “1” if internal control is valid, “0”, if it is not valid.

CEO duality (Dual)

It is a dummy variable, measured as “1” and “0”; 1 for the enterprises having dual roles of CEO in a given year, otherwise “0”.

Ownership concentration (Own_Con)

The shareholding ratio of the major five shareholders is classified as the ownership concentration.

Financial distress (Z-score)

Altman’s Z-score is used as the measure of corporate financial distress, and its mathematical equation is as follows:

$$Z - score = 1.2 \times \left(\frac{\text{Working Capital}}{\text{Total Assets}} \right) + 1.4 \times \left(\frac{\text{Retained Earnings}}{\text{Total Assets}} \right) + 3.3 \times \left(\frac{\text{EBIT}}{\text{Total Assets}} \right) + 0.6 \times \left(\frac{\text{Market Value of Equity}}{\text{Book Value of Total Liabilities}} \right) + 1.0 \times \left(\frac{\text{Sales}}{\text{Total Assets}} \right) \quad (1)$$

3.2.3 Control variables

The control variables of this study include firm size (*Size*) measured as the natural logarithm of total assets of the company in a particular financial year, firm liquidity (*Liq*) measured as current assets by current liabilities, debt to equity ratio (*D/E*) is the capital structure ratio measured as debt divided by equity, firm profitability (*ROA*) measured as net income divided by total assets, and firm growth (*Growth*) measured as the change in decimals in operating revenue of company.

3.3 Models

This study employs fixed effects regression model to investigate the influence of internal control quality, CEO duality,

ownership concentration, and financial distress on corporate fraud. Based on hypotheses, the models (2) to (5) are constructed as follows:

$$Fraud_{i,t} = \beta_0 + \beta_1 IC\ Qlty_{i,t} + \sum \beta_k \text{controls}_{i,t} + v_i + \gamma_t + \varepsilon_{i,t} \quad (2)$$

$$Fraud_{i,t} = \beta_0 + \beta_1 Dual_{i,t} + \sum \beta_k \text{controls}_{i,t} + v_i + \gamma_t + \varepsilon_{i,t} \quad (3)$$

$$Fraud_{i,t} = \beta_0 + \beta_1 Own_Con_{i,t} + \sum \beta_k \text{controls}_{i,t} + v_i + \gamma_t + \varepsilon_{i,t} \quad (4)$$

$$Fraud_{i,t} = \beta_0 + \beta_1 Z\text{-score}_{i,t} + \sum \beta_k \text{controls}_{i,t} + v_i + \gamma_t + \varepsilon_{i,t} \quad (5)$$

where *Fraud* is the corporate fraud risk, *IC Qlty* is the internal control system quality, *Dual* represents the CEO duality, *Own_Con* denotes the ownership concentration, *Z-score* is the corporate financial distress risk, β is the regression coefficient for associated variables, v and γ indicate time (t) and firm (i) fixed effects, and ε denotes the error term.

4. Analysis of empirical results

4.1 Descriptive results analysis

As shown in Table 1, *Fraud* has a mean value of 0.1901 for the sample data, which indicates the existence of corporate fraud in Chinese A-share listed enterprises. *IC Qlty* has a mean value of 0.844, with a standard deviation of 0.3635, which denotes the existence of an overall high-quality internal control system in China's enterprises. *Dual* has a mean value of 0.2792 which shows that many enterprises in China have dual roles of CEOs which can significantly influence corporate frauds. Ownership concentration (*Own_Con*) has a mean value of 31.0048 with a standard deviation of 15.1669, and it indicates that firms in China have high ownership concentration which may dominate the role of shareholders to influence the decisions within enterprises. Corporate distress risk (*Z-score*) presented a mean value of 9.5834, which shows that there are significant distress situations experienced by Chinese enterprises, which could put pressure on managers. The descriptive statistics for all control variables are in an acceptable range.

Table 1. Descriptive statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Fraud	12,833	0.1901	0.3924	0	1
IC Qlty	12,833	0.8433	0.3635	0	1
Dual	12,833	0.2792	0.4486	0	1
Own_Con	12,833	31.0048	15.1669	0	99.32
Z-score	12,833	9.5834	615.3714	-700.877	69667.94
Size	12,833	21.8571	1.3648	9	27.2684
Liq	12,833	2.2018	3.8682	0	190.8692
D/E	12,833	1.6670	38.7989	-2266.74	1913.082
ROA	12,833	2.0402	222.7958	-51.9457	25222.73
Growth	12,833	8.7860	557.8288	-45.5523	59411.55

4.2 Correlation analysis

The correlation analysis results of the current study are shown in Table 2. The correlation coefficient of -0.0338 presents a negative relationship between *Fraud* and *IC Qlty*, suggesting that with the increase in internal control quality, there will be mitigation in corporate frauds. CEO duality (*Dual*) has a positive relationship with *Fraud*, reflected by a correlation coefficient of 0.0151, which demonstrates the positive link between these variables. Ownership concentration has shown an insignificant nexus with corporate frauds, which required further testing through regression analysis. There is a negative relationship that exists between corporate distress (*Z-score*) and corporate fraud (*Fraud*), indicated by a value of -0.0041, suggesting that as there will be increased corporate financial distress risk there will be more corporate frauds.

Table 2. Correlation analysis results

	Fraud	IC Qlty	Dual	Own Con	Z-score	Size	Liq	D/E	ROA	Growth
Fraud	1.0000									
IC Qlty	-0.0338*** (0.0001)	1.0000								
Dual	0.0151* (0.0879)	0.0475** (0.0000)	1.0000							
Own_Con	-0.0133 (0.1330)	0.0244** (0.0058)	-0.0271** (0.0022)	1.0000						
Z-score	-0.0041*** (0.0064)	0.0050 (0.5703)	-0.0048 (0.5900)	-0.0185* (0.0358)	1.0000					
Size	0.0147* (0.0956)	0.1499** (0.0000)	-0.0983** (0.0000)	0.0866** (0.0000)	-0.0751** (0.0000)	1.0000				
Liq	-0.0180* (0.0419)	0.0713** (0.0000)	0.0808** (0.0000)	0.0758** (0.0000)	0.0023 (0.7942)	-0.1363** (0.0000)	1.0000			
D/E	-0.0057** (0.0416)	0.0107 (0.2268)	-0.0068 (0.4421)	-0.0029 (0.7448)	-0.0008 (0.9279)	0.0117 (0.1869)	-0.0123 (0.1651)	1.0000		
ROA	-0.0046*** (0.000)	0.0032 (0.7176)	-0.0056 (0.5224)	-0.0181* (0.0401)	0.9987** (0.0000)	-0.0726** (0.0000)	-0.0051 (0.5641)	-0.0006 (0.9428)	1.0000	
Growth	-0.0052*** (0.001)	0.0009 (0.9219)	-0.0023 (0.7904)	-0.0042 (0.6316)	-0.0002 (0.9805)	0.0121 (0.1717)	-0.0029 (0.7406)	0.0001 (0.9923)	-0.0001 (0.9877)	1.0000

Notes: p-values in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

4.3 Benchmark regression analysis

The benchmark results from Table 3 reveal several insights into the factors that influence corporate financial fraud in Chinese A-share listed enterprises. Column (1) of Table 3 shows that internal control quality (IC Qlty) has a regression coefficient of -0.0383, which indicates that higher internal control quality reduces corporate financial fraud in China's corporate sector. Column (2) reports a regression coefficient of 0.0156 for CEO duality (Dual), which implies that when the CEOs serve as the board chairperson with their primary role, the incidence of fraud increases. Column (3) demonstrates that ownership concentration (Own_Con) has a regression coefficient of 0.0321, which suggests that higher ownership concentration increases the likelihood of fraudulent behavior in Chinese A-share listed enterprises. Lastly, Column (4) of Table 3 shows that the Z-score has a regression coefficient of 0.219, implying that firms experiencing financial distress are more prone to fraudulent activities in the context of Chinese A-share listed enterprises.

The negative impact of internal control quality on corporate fraud supports the view that firms with robust internal control are able to reduce opportunities for fraudulent activities by enhancing oversight and accountability (Zeng, Yang, & Shi, 2021). The positive association between CEO duality and fraud is the indication that increased power concentration results in undermining effective oversight and increasing the risks of unethical behavior. The ownership concentration has a positive effect on fraud, and it posits that concentrated ownership tends to conflict of interests and leads the owners to prefer their own interests over the minority shareholders' interests (X. Chen, Feng, & Li, 2020). Lastly, the

positive nexus between financial distress and corporate fraud suggests that firms experiencing financial pressure are more prone to adopt misreporting practices. Collectively, these findings emphasize the need for a comprehensive governance mechanism that could address the vulnerabilities and foster corporate transparency.

Table 3. Benchmark results

Variable	Column (1) <i>Fraud</i>	Column (2) <i>Fraud</i>	Column (3) <i>Fraud</i>	Column (4) <i>Fraud</i>
IC Qlty	-0.0383*** (-3.96)			
Dual		0.0156** (2.00)		
Own_Con			0.0321*** (3.51)	
Z-score				0.219** (2.37)
Size	0.0052** (2.01)	0.0040** (2.55)	0.0039* (1.72)	0.0037** (2.42)
Liq	-0.0013 (-1.46)	-0.0018** (-1.97)	-0.0015* (-1.70)	-0.0018** (-2.01)
D/E	-0.011*** (-3.65)	-0.0134*** (-3.68)	-0.0142*** (-3.69)	-0.01*** (-2.69)
ROA	-0.2511*** (-3.36)	-0.3291** (-3.40)	-3.1561*** (-3.44)	-0.004 (-1.39)
Growth	-0.045*** (-6.62)	-0.0247*** (-4.61)	-0.2691*** (-6.52)	-0.076 (-6.61)
Constant	0.1114** (1.97)	0.1022*** (2.79)	0.1186** (2.10)	0.1137** (2.01)
R-squared	0.181	0.092	0.0717	0.173
N	12,833	12,833	12,833	12,833

Notes: t-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

4.4 Robustness testing

This study uses lagged values of explanatory variables to check the robustness of benchmark results, which is a common method in empirical analysis. This method addresses potential endogeneity concerns, where explanatory variables may be correlated with the error term, and lead to inconsistent or biased estimates (Wooldridge, Wadud, & Lye, 2016). The use of lagged values mitigates reverse causality concerns and ensures the influence direction from independent variables to the dependent variable (West, Wong, & Anatolyev, 2009). Moreover, lagged variables account for dynamic effects, and capture the effects of past values of explanatory variables on current outcomes (Arellano & Bond, 1991). Table 4 reports the robustness results, using the lagged values of the explanatory variables. The results show that *LIC*

Qlty has a negative regression coefficient, and all other variables—*L.Dual*, *L.Own_Con*, and *L.Z-score*—have positive regression coefficients. The values for all these variables are significant, indicating that internal control quality reduces corporate fraud risks, while CEO duality, ownership concentration, and financial distress increase the likelihood of corporate frauds in Chinese A-share listed enterprises. These results are aligned with benchmark results, and thus we accept all hypotheses of this study.

Table 4. Robustness check using the lagged values of explanatory variables

Variable	Column (1) <i>Fraud</i>	Column (2) <i>Fraud</i>	Column (3) <i>Fraud</i>	Column (4) <i>Fraud</i>
L.IC Qlty	-0.0176* (-1.76)			
L.Dual		0.0223*** (2.75)		
L.Own_Con			0.0391** (2.18)	
L.Z-score				0.198*** (3.39)
Size	0.0021*** (2.76)	0.0019*** (2.70)	0.0012** (2.44)	0.0011*** (2.45)
Liq	-0.0018* (-1.77)	-0.0021** (-2.09)	-0.0020* (-1.95)	-0.0020* (-1.94)
D/E	-0.0121** (-1.97)	-0.015** (-2.95)	-0.011*** (-3.94)	-0.0148*** (-3.96)
ROA	-0.197** (-2.25)	-0.219** (-2.45)	-0.167** (-2.48)	-0.198** (-2.38)
Growth	-0.0221*** (-5.60)	-0.0324*** (-5.61)	-0.0431*** (-4.72)	-0.0671*** (-5.42)
Constant	0.1679*** (2.81)	0.1517** (2.52)	0.1712*** (2.87)	0.1731*** (2.89)
R-squared	0.172	0.112	0.156	0.118
N	11,923	11,923	11,923	11,923

Notes: z-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

4.5 Heterogeneity analysis

4.5.1 Financial leverage

The financial leverage can influence the nexus between underlying factors and corporate fraud as high financial leverage increases pressure on firms to meet their financial obligations, which can lift the chances of fraudulent activities as managers could resort to unethical practices aimed at presenting a favorable financial outlook (X. Chen et al., 2020). In highly leveraged firms, shown in columns (1) to (4) of Table 5, CEO duality and ownership concentration increase fraud risk. In low-leveraged enterprises, shown in columns (5) to (8), the internal control quality and CEO duality negatively influence corporate fraud risk, while financial distress fosters the likelihood of fraudulent activities. The negative influence of CEO duality on corporate fraud risk suggests that concentrated leadership could better work in less pres-

sured environments (Zeng et al., 2021).

Table 5. Financial leverage heterogeneity

Variables	Highly Leveraged				Low Leveraged			
	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)	Column (7)	Column (8)
	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>
IC Qlty	0.0110 (1.00)				-0.0198* (-1.80)			
Dual		0.0283** (2.15)				-0.1126*** (-7.89)		
Own_Con			0.031*** (2.81)				-0.0003 (-0.96)	
Z-score				0.0005 (0.32)				0.0312* (1.90)
Constant	0.0844 (1.02)	0.1091 (1.32)	0.0942 (1.15)	0.0941 (1.14)	0.0428 (0.53)	-0.0007 (-0.01)	0.0230 (0.28)	0.0006 (0.01)
R-squared	0.075	0.131	0.072	0.161	0.141	0.050	0.047	0.051
N	6,429	6,429	6,429	6,429	6,404	6,404	6,404	6,404

Notes: t-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

4.5.2 Business cycle

The firms with different paces of the business cycle could experience different situations, which can lead them to adopt different practices to manage corporate fraud risks. During fast business cycles, firms have rapid growth and expansion plans, and they could lead to heightened pressure to meet performance targets, which may increase the likelihood of fraudulent activities (Lins, Servaes, & Tamayo, 2017). The results of the heterogeneity analysis are based on the business cycle in Table 6. As shown in columns (1) and (5) of Table 6, it can be seen that firms with fast or slow business cycles have the effective role of internal control quality to counteract the risks of corporate fraud. CEO duality, shown in columns (2) and (6), posits a positive impact on corporate financial risk. However, in fast-paced enterprises, CEO duality has a greater influence on corporate fraud, implying that firms under pressure to perform aggressively, have the aggressive behavior of CEOs, which leads to increased risks of corporate fraud. For ownership concentration and financial distress, it is found that impact is significant only in fast-cycle enterprises, which suggests that the firms with a higher concentration of shareholding ratio and financial distress during fast business cycles tend to indulge in fraudulent practices.

4.5.3 Firm size

Firm size is an essential factor that shapes the characteristics and potential of enterprises to manage their operations and thus avoid or engage in fraudulent practices. Large-sized enterprises have complex structures and face different challenges and pressures compared to small-sized enterprises (Faccio, Marchica, & Mura, 2016). Firm size heterogeneity analysis results are shown in Table 7. For large-sized enterprises, results reported in columns (1) to (4) of Table 7, internal control quality and ownership concentration reduce the likelihood of fraudulent practices, while CEO duality and financial distress positively influence corporate fraud in China. For small-sized enterprises (columns 5 to 8), internal control quality mitigates the corporate fraud risk, and ownership concentration and financial distress promote this risk. These findings underline the need to adopt size-specific governance and financial strategies to mitigate corporate fraud risks.

Table 6. Business cycle heterogeneity

Variables	Fast Cycle				Slow Cycle			
	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)	Column (7)	Column (8)
	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>
IC Qlty	-0.0593*** (-4.12)				-0.0225* (-1.74)			
Dual		0.0299*** (3.05)				0.009** (2.63)		
Own_Con			0.0007** (2.14)				0.0001 (0.42)	
Z-score				0.011** (2.47)				0.0002 (1.55)
Constant	0.0536 (0.61)	0.0520 (0.59)	0.0641 (0.73)	0.0314 (0.35)	0.1051 (1.44)	0.0873 (1.19)	0.1113 (1.52)	0.1075 (1.47)
R-squared	0.153	0.128	0.134	0.131	0.08	0.115	0.142	0.071
N	6,703	6,703	6,703	6,703	6,130	6,130	6,130	6,130

Notes: t-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

Table 7. Firm size heterogeneity

Variables	Large Size				Small Size			
	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)	Column (7)	Column (8)
	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>
IC Qlty	-0.0697*** (-4.33)				-0.0118 (-0.99)			
Dual		0.0359*** (2.98)				0.0001 (0.01)		
Own_Con			-0.051* (-1.75)				0.06* (1.73)	
Z-score				0.0035* (1.67)				0.02* (1.71)
Constant	0.7641*** (6.01)	0.7085*** (5.55)	0.7470*** (5.87)	0.7906*** (6.05)	-0.2034* (-1.75)	-0.1973* (-1.70)	-0.2007* (-1.73)	-0.2009* (-1.73)
R-squared	0.131	0.130	0.129	0.121	0.131	0.120	0.124	0.142
N	6,093	6,093	6,093	6,093	6,740	6,740	6,740	6,740

Notes: t-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

4.5.4 Industry analysis: Heavily polluted

In response to the pressure of achieving sustainability goals, firms could adopt those practices that can look environment-friendly but in reality, they are not. This led the industry regulators to classify industries as per their attribution of pollution. Heavily polluted industries had to face strict regulatory oversight and higher compliance costs, which can influence their operational and governance dynamics (Bao & Yu, 2023). The heterogeneity analysis results based on

industry pollution levels are reported in Table 8. Comparatively, it is shown that internal control quality is more effective in reducing corporate fraud risks in heavily polluted industries, CEO duality fosters corporate frauds only in non-heavily polluted industries, and the positive effects of ownership concentration and financial distress on corporate fraud risk are relatively higher in non-heavily polluted industries in China.

Table 8. Heavily polluted industries' heterogeneity

Variables	Heavily Polluted Industries				Not Heavily Polluted Industries			
	Column (1)	Column (2)	Column (3)	Column (4)	Column (5)	Column (6)	Column (7)	Column (8)
	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>	<i>Fraud</i>
IC Qlty	-0.0393** (-2.16)				-0.0721*** (-3.46)			
Dual		-0.0028 (-0.18)				0.0193** (2.17)		
Own_Con			0.011** (2.22)				0.0712** (2.48)	
Z-score				0.0001 (0.13)				0.0221** (2.45)
Constant	-0.0074*** (-3.07)	0.0210*** (3.14)	-0.0090** (-1.98)	-0.0012** (-2.01)	0.1251* (1.92)	0.1137* (1.73)	0.1359** (2.08)	0.1280* (1.96)
R-squared	0.065	0.050	0.066	0.050	0.211	0.142	0.156	0.113
N	2,987	2,987	2,987	2,987	9,846	9,846	9,846	9,846

Notes: t-statistics in brackets; *, **, and *** indicate the significance level at 10%, 5%, and 1% respectively.

5. Conclusion and policy implications

5.1 Conclusion

Using data from Chinese A-share listed enterprises from 2007-2023, this study uses a two-way fixed effects model to examine the effects of internal control quality, CEO duality, ownership concentration, and financial distress on corporate fraud. The benchmark results show that higher internal control quality mitigates corporate fraud risk, while CEO duality, ownership concentration, and financial distress increase it. Robustness checks using lagged variables confirm the findings presented by the benchmark results. Heterogeneity analysis tests show that in highly leveraged firms, CEO duality and ownership concentration significantly increase fraud risk, whereas internal control quality reduces this risk. In low-leveraged firms, internal control quality reduces fraud, and CEO duality and financial distress contribute to the increased fraud risk. Business cycle heterogeneity shows that robust internal controls are critical in both fast and slow cycles, but CEO duality and ownership concentration have varied effects across enterprises. Lastly, industry analysis indicates that internal controls are crucial in both heavily and less polluted industries, with ownership concentration and financial distress having significant impacts in less polluted sectors.

5.2 Policy implications

There are several policy implications that could be derived from the findings of this study. First, enhancing internal control quality is the most robust factor that reduces corporate fraud risks across organizations of different leverage levels, business cycles, and industries. Policymakers should frame strict internal control requirements and implement regular audits to ensure the compliance of the organization. Second, it is suggested to separate the roles of CEO and board chairperson, as it reduces the effectiveness of corporate governance and grounds for corporate fraud. Third, ownership concentration poses significant fraud risk, so it is recommended to promote ownership dispersion to protect minority shareholders' interests. Fourth, managers should protect their organizations from being indulged in financially dis-

tressed situations, which can turn significant pressure to engage in fraudulent practices. Fifth, Policymakers should impose financial and non-financial penalties on managers and executives involved in corporate fraud to set an example for others, thereby directly enhancing transparency within organizations. Lastly, firms are required to adopt the internal control, CEO duality, ownership concentration, and financial distress strategies by accounting their leverage level, business cycle pace, size, and industry classification.

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