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Financial statement fraud, recidivism and punishment

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ABSTRACT

This study examines the relationship between the high reported levels of recidivism committed by Chinese firms and different punishments between 2007 and 2019. We find that there are six major types of financial statement fraud with many firms employing multiple fraud techniques simultaneously. When administrative and supervisory measures are used to punish fraudulent firms, recidivism is significantly reduced. In contrast, when self-regulatory measures are used to punish fraudulent firms, we report recidivism is not reduced yet increases. The results imply administrative measures are the most effective measures to tackle reoffending and self-regulatory measures are the least effective punishment.

1. Introduction

How can we limit the repeated occurrence of financial statement fraud? This is a challenging question as a schism exists as to how accounting, financial and business regulations (Ford, 2008) should be enacted, enforced to deter future offending. Should regulations be enforced using public legal methods, requiring strict and retributive punishments to deter future offending? Alternatively, are private self-regulatory solutions with less onerous punishments preferable? More generally, should punishments reflect the cost of financial statement fraud and involve enhanced regulatory supervision? This study examines the effectiveness of these different approaches to punish and constrain repeated financial statement fraud. We examine these questions in a Chinese context where a miscellany of punishments for financial statement fraud are employed by the China Securities Regulatory Commission (hereafter CSRC), and through the Chinese stock exchanges (Wang et al., 2019b).

The study uses a unique hand-collected data set of financial statement fraud and punishments reported between 2007 to 2019. This data includes administrative, supervisory, and self-regulatory forms of punishment. We report administrative punishments including fines and warnings are the most influential punishments in limiting reoffending or recidivist accounting fraud. Supervisory measures are used for moderately severe cases of financial statement fraud and involve the use of rectification notices whereby firms are required to amend for their wrongdoing. These supervisory measures also have a significant impact on reducing recidivism in financial statement fraud. Lastly, self-disciplinary measures including public criticism are issued by the Chinese stock exchanges for the least severe cases. These self-disciplinary measures are significantly and positively related to the likelihood of recidivism and are therefore viewed to be the least effective measures in limiting future offending.

China is an appropriate setting to explore recidivist financial statement fraud and the effectiveness of different punishments. While

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this nation has the world's second largest economy and capital markets (World Bank, 2023), it has relatively weak investor protection and law enforcement (Xu and Xu, 2020) with often selective enforcement of public laws. This weak legal environment provides opportunities for financial fraud to occur (Wang et al., 2019b) with fraud widespread across China (Hass et al., 2016). Further, the distinct regulatory context and different regulatory tools employed within China allow the comparison of multiple approaches to punish repeated financial statement fraud. Assessing the veracity of these forms of punishment is a pressing concern considering the limited success in addressing Chinese recidivist financial statement fraud to date (Wang et al., 2019b).

The research question is important to address for many reasons. Fraudulent financial reporting undermines public confidence, engenders inefficient capital allocation decisions (Niu et al., 2019), and results in negative stock market reactions (Wang et al., 2019b). This is worrisome as financial statement fraud is a non-socially responsible behavior with multiple costs for the firm, the economy and society. While the relationship between fraud and corporate social responsibility is complicated (Gong et al., 2021), it is clearly not beneficial to commit fraud. For instance, when firms display less responsible behaviors, they face higher financial distress risks (Boubaker et al., 2020), greater financial risks (Liu et al., 2021), lower levels of creditworthiness (Brogi et al., 2022), and lower financial performance (Lu and Abeysekera, 2021).

This study contributes to the literature in multiple ways. First, we revisit the long-standing discussion as to the efficacy of regulation and optimal punishments (Becker, 1968; Ehrlich, 1996; Gneezy and Rustichini, 2000; La Porta et al., 2006; Polinsky and Shavell, 1979; Stigler, 1970). We contribute to this discussion through examining the deterrence effect of administrative, supervisory and self-regulatory measures in a Chinese context. Moreover, this is the first study to examine the channels through which different punishments influence recidivism.

Second, we contribute to the literature examining the calibration of regulation to constrain financial misconduct more effectively (Charoenwong et al., 2019; Pasiouras, 2016) through examining how different punishments deter financial statement fraud. While the prior literature has mostly examined the antecedents of regulations (Caskey and Hanlon, 2013; Hass et al., 2016) or the effects of regulation on firms (Charoenwong et al., 2019), there is a dearth of evidence on the effectiveness of fraud punishments (Davis and Pesch, 2013). This is troubling as poorly framed financial regulation has substantial unintended consequences (Zeume, 2017) with considerable costs for firms and regulators (Marcel and Cowen, 2014).

We also contribute to a growing literature (Caskey and Hanlon, 2013; Hass et al., 2016; Wang et al., 2022a) examining the causes and implications of financial statement fraud internationally. We add to this field by addressing recidivism and partial observability. Thus far, only Zheng and Chun (2017) have examined recidivism and corporate fraud. These authors report recidivism is influenced by peer misconduct, the stress arising from financial failure and lower external evaluations by professional institutions and investors. Financial fraud in China has also been previously examined with assessments focusing on the individual incentives and firm motivations for committing fraud (Chen et al., 2006; Tan et al., 2017; Xu et al., 2017), how fraud has changed over time and the financial implications of fraud (Wang et al., 2019b). We add to this dialogue by considering the punishments for recidivist financial statement fraud and incorporating the rarely considered decisions made by the CSRC regional offices in our assessment.

The paper proceeds as follows. The next section outlines the research setting and introduces the hypotheses. The third section presents the data and the methodology. The fourth section discusses the results from the main and robustness tests, and the final section concludes and provides policy recommendations.

2. Research setting and hypotheses development

2.1. Research setting

According to U.S. Statement on Auditing Standards No.99, financial statement fraud is the intentional misstatement or omission of amounts or disclosures in financial reporting, to mislead financial reporting users. Many forms of this behavior exist including fictitious recording of journal entries, unusual transactions, improper adjustments of accounting assumptions and omission or postponement of events or transactions (Zhu and Gao, 2011).

In China, multiple institutions are empowered to investigate, judge, and punish financial statement fraud. For the most severe offences the central CSRC offices are used. The CSRC was established in 1992 (Wang et al., 2019a) with a combined scope like that provided by the U.S. Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission. The CSRC enforcement system includes an Enforcement Bureau, an Administrative Sanction Committee for trying cases, and 38 regional offices with frontline supervisory and investigative duties (China Securities Regulatory Commission (CSRC), 2013). The power to issue administrative decisions was extended to all regional offices in 2013 (Xu et al., 2017; Xu and Xu, 2020). Besides the CSRC central and regional offices, two stock exchanges and the Ministry of Finance (MOF) also regulate corporate disclosure. The Shanghai and Shenzhen stock exchanges are membership-based organizations which act as de facto legal authorities by self-policing and creating rules for their members. Their authority to impose self-disciplinary measures (Xu et al., 2017) is recognized in law. The MOF also has jurisdiction over financial reporting of Chinese firms and accounting professionals such as auditors (Lisic et al., 2015).

To address financial statement fraud in China, regulators use three types of punishments. These include administrative sanctions, supervisory measures, and self-regulatory approaches (China Securities Regulatory Commission (CSRC), 2014).¹ Administrative sanctions include warnings, fines, disgorgement of illegal gains, repayment of tax, temporary suspension, and rescission of licenses.

¹ The Appendix 1 contains a detailed description of fraud punishments.

These punishments are issued by the CSRC and most frequently consist of fines and warnings. The goal of administrative sanctions is to impose retributive punishments on violators for the damages they cause. This requires violators not only to make amends for their offences yet pay additional legal penalties and shoulder reputational losses to deter reoffending. These penalties are low by international standards with fines capped at 600,000 Yuan (about \$87,000) by the Chinese Securities Law. Xu et al. (2017) report the penalties and disgorgements imposed by the CSRC are 2% of those imposed by the U.S. securities regulator. Recently, the maximum fine which can be imposed for financial statement fraud increased to RMB10 million (about US\$1.43 million) (Zhang, 2020).

Supervisory measures are issued by CSRC regional offices for moderately severe cases of financial statement fraud (China Securities Regulatory Commission (CSRC), 2014). In total, 18 different supervisory measures can be imposed. These include rectification notices, statements of regulatory concern, letters of warning, public statements, and regulatory interviews. Supervisory measures aim to stop and correct aberrant behaviors. Therefore, violators only need to pay the costs that equal the damage caused by their offending, without a retributive element. Theoretically, supervisory measures are temporary decisions; if a listed firm does not amend its behaviors, administrative sanctions can be applied (Wang et al., 2019b).

Self-regulatory measures are imposed by the Shanghai and Shenzhen stock exchanges to address minor offences. Self-disciplinary measures include public criticism and condemnation, and lesser-used verbal warnings and business suspension. Public condemnation is a stronger sanction than public criticism, although these two punishments are both used to address minor offences. In practice, stock exchanges are likely to impose public condemnation on violators in a bull stock market and impose public criticism on violators in a bear market (Wang et al., 2019b).

2.2. Hypotheses development

The decision to engage in financial fraud has long been framed as a cost-benefit trade-off (Becker, 1968). An economic actor will consider how much they might earn from the offence balanced against the costs and probability of being caught (Fischer and Verrecchia, 2000). To deter crime, punishments should produce sufficient costs for offenders to outweigh any gains the offender receives from their offending (Werden, 2009). In this framework more severe expected punishments are assumed to reduce crime levels (Gneezy and Rustichini, 2000).

To combat reoffending within this economic framework, punishment should not only inconvenience offenders yet deter future offending within a cost-effective regulatory mechanism (Becker, 1968). For instance, fines should increase to the value of damage caused to victims adjusted upwards for the probability of apprehension (Becker and Stigler, 1974). Deterrence also justifies levels of punishment which creates disincentives for those contemplating committing fraud in the future (Rich, 2016). This might be achieved by incorporating prior offences as a basis for imposing progressively more severe sanctions or increasing penalties for repeated offences (Bagaric, 2014).

Two-period models of the first and subsequent incidences of crime have been developed to examine this issue. For instance, deterrence is greater if the punishment for the first crime is lower than the punishment for subsequent offending (Rubinstein, 1980). Polinsky and Shavell (1998) propose that if optimal deterrence in the first incidence of crime is not possible, maximum punishments should be reserved for subsequent offending. Likewise, Mungan (2014) argues that if punishments for recidivism are sufficiently high, offenders may not only rationally forgo the opportunity to commit profitable fraud today but also avoid being punished as repeat offenders in the future.

Notwithstanding the intuition of these arguments, we observe the impact of applying punishments is imprecise. Constraints on punishment can arise including limited marginal deterrence and the unfairness of heavy punishments when capture is improbable, undermining and even amplifying offending activity (Stigler, 1970). The presence of risk aversion, the wealth of the offending economic actor (Polinsky and Shavell, 1984) and the scale and form of enforcement costs (Polinsky and Shavell, 1992) can also complicate these arrangements.

This economic approach to deterring crime has its distractors. As criminality is a learned behavior developing from its environment, reoffending could plausibly arise due to prevailing traditions, beliefs, or social norms (Manski, 1993). Here, repeated financial statement fraud becomes a normal commercial practice (Nguyen and Pontell, 2010) and is embedded in the firms' corporate culture (Balch and Armstrong, 2010). The offender therefore acts in a dysfunctional, socially constructed manner rather than pursuing an amoral, rational, economic choice (MacLean, 2008). Unless challenged these norms and subsequent corrupt behaviors are expected to persist (Tirole, 1996). Indeed, social norms including religious participation or politics have influenced the occurrence of corrupt behaviors over decades (Dass et al., 2021). As social norms are linked with firms' financial statement fraud reoffending (Karpoff, 2021), we imagine punishments might gainfully engage in altering such underlying influences. We propose supervision and guidance of offenders is a useful step in this direction, whereby offenders are charged the cost of their offending and engage with the regulator to amend their behaviors.

Theories of punishments are also theories of how to justify the use of coercive power to sanction people. Public and private interest perspectives provide a theoretical backdrop for evaluating such coercion (McCraw, 1975). From a public interest perspective, an active role of government is predicated on the existence of market failures and the need for consumer protection. From this standpoint, an appropriate response would be the use of severe and retributive administrative punishments to deter future offending. In contrast, a private interest view holds that markets can resolve most market failures such as fraud, without government intervention. Hence, a greater reliance is placed on market discipline and information disclosure, rather than regulatory punishments (Shleifer, 2005) with fewer incentives to compensate investors for any losses (Wang et al., 2019b).

Turning to the form and function of these punishments, administrative and supervisory measures are based on formal legislation. Administrative sanctions include severe and conclusive punitive measures. When these are imposed, violators are not only expected to

correct their behaviors, yet also pay additional costs in legal penalties or reputational losses to ensure they do not re-offend (Wang et al., 2019b). Non-administrative sanctions including supervisory, and self-regulatory measures are less severe but time-sensitive measures implemented by regulators (China Securities Regulatory Commission (CSRC), 2014) to stop and correct aberrant behaviors. Self-regulation refers to standards set and enforced by self-regulating bodies, such as stock exchanges, to govern and monitor their own members' conduct without the need for outside regulatory intervention (Dombalagian, 2007). In cases of limited competition, self-regulators may lack strong incentives to punish their members and enforce self-regulation. Moreover, compared to formal regulation, self-regulation contributes little in compensating investors for the losses resulting from fraudulent activities (Wang et al., 2019b).

Compared to administrative and supervisory measures, self-regulatory measures are the least severe punishments. We propose these less severe punishments are unlikely to instill a sense of fear in the mind of the perpetrators (Boeglin and Shapiro, 2017) and may not be effective in discouraging re-offending. We therefore test:

H1. Self-regulatory punishments cannot effectively reduce financial statement fraud reoffending, whereas supervisory measures and administrative punishments are expected to deter recidivism in financial statement fraud.

3. Data, variables and methodology

3.1. Data

Our analysis uses data collected from websites and databases. For fraud and punishment related data, we use a hand-collected textual dataset of regulatory sanction reports issued by the central CSRC office, regional CRSC offices, the Shanghai and Shenzhen Stock Exchanges and the Ministry of Finance. This dataset is developed from previous contributions (Chen et al., 2006; Zhu and Gao, 2011) by incorporating sanction decisions made by CSRC regional offices (Xu and Xu, 2020). The sanction reports are verified by the CSRC, the MOF and the stock exchanges, publicly available and downloaded from the CSRC, 'CNINFO' websites, and the Shanghai and Shenzhen Stock Exchange official websites. We examine the context of the sanction reports to capture the specific corporate behaviors and punishments relating to fraud.

Our corporate governance and financial performance data is collected from the China Stock Market and Accounting Research (CSMAR) database. Corporate governance variables include state ownership, institutional ownership, managerial ownership, big 4 audit firms, board independence, CEO duality and board size. Financial performance variables consist of firm size, leverage, returns on equity and profit growth rate. As new Chinese accounting standards were adopted in 2007, we use fraud cases from this date to ensure only cases using common accounting standards are examined (Lin and Fu, 2017).

The original fraud sample consists of 4516 firm-year observations between 2007 and 2019. These fraud cases were undertaken from firms that issue 'A' shares on the main board of the domestic Chinese stock exchanges. The study focuses on financial statement fraud. Non-financial statement fraud cases such as environmental pollution fraud and product safety fraud are excluded, with 839 firm-year observations dropped from the assessment. There are 2453 firm-year observations of stock market fraud such as insider trading, market abuse, stock price manipulation, stock IPO fraud etc. These firm-year observations are dropped as they are outside the scope of financial statement fraud. Our sample also excludes 214 fraud cases where information is not published on time and fraud cases involving a firm's temporary announcements.

Following this selection procedure our final sample consists of 1010 firm-year observations. These sanction decisions include approximately 22% issued by CSRC central offices, 60% from CSRC regional offices, 17% issued by stock exchanges, and 1% from other institutions such as the Ministry of Finance. These decisions are mainly based on 'Accounting Standards for Enterprises' (20%), 'Securities Law' (19%), 'Administrative Measures for the Disclosure of Information of Listed Companies' (14%) and 'Rules of Stock Exchanges for the Listing of Stocks' (14%).

3.2. Content analysis method

We use content analysis to categorize textual items from qualitative data sources (Holsti, 1969; Linsley and Shrivs, 2006; Zhu and Gao, 2011) and determine the incidence of fraudulent financial reporting and punishments. Coding, the process of categorizing data, is conducted following the widely referenced, manifest approach (Holsti, 1969). The form of analysis is based on Weber (1990)'s coding approaches to tailor the research setting and mitigate rater bias. Information about the types of fraud requires the coder to read the narrative for meaning and apply judgment to determine the appropriate fraud classification. This procedure uses sentences as the coding unit, where the meaning of the whole sentences is interpreted (Li, 2010) rather than applying a dictionary approach whereby words are considered in isolation.

Punishment information is recorded from the report extracts. We categorize financial statement fraud following the categories defined by Zhu and Gao (2011) and formulate new fraud groups when a fraud case exists outside these categories. Subsequently, six major types of fraud are coded, including false income statements, false balance sheets, false cash flow statements, improper financial statement consolidation, delayed disclosure of annual reports and insufficient and false disclosure of information. Using a similar coding approach, within each of these six categories, a series of appropriate items are identified to establish relevant 40 sub-categories of specific fraud techniques.

To increase coding reliability and validity, an independent coder separately read and coded a randomly selected 10% of sanction reports. Training was provided and consisted of familiarizing the coder with appropriate terms and procedures (Linsley and Shrivs,

2006). Following Lombard et al. (2002), ‘Cohen’s Kappa’ and ‘Krippendorff’s Alpha’ were used to calculate inter-coder reliability coefficients. The intercoder reliability is high with a Cohen’s Kappa of 0.946 (statistical significance 1% and standard error of 0.018), implying high reliability following the Landis and Koch (1977) criteria. The Krippendorff’s Alpha is 0.932, indicating high reliability. A bootstrapping procedure indicates a 0.002 chance that the Krippendorff’s Alpha would below 0.800 if the whole population was tested.²

3.3. Variables and probit model

The dependent variable is corporate recidivism. Recidivism occurs when a firm re-offends in a subsequent year following a first-time offence. When a single sanction report identifies a firm repeatedly committing the same fraud over several years, it is treated as only offending once. Reoffending in a single year is also recorded as an individual case of fraud.

Self-disciplinary, supervisory, and administrative punishments are independent variables. These are dummy variables that equal one if a firm is subject to self-disciplinary, or supervisory or administrative measures and zero otherwise.

We use several control variables relating to fraud features, ownership characteristics, board features and financial performance. First, the number of fraud cases and the duration of fraud are included. The number of fraud cases includes the total number of fraud cases that a firm committed and later disclosed by regulators. The duration of fraud is quantified as the number of years from the first fraud to the year in which the last fraud is committed. These two variables represent the severity of fraud. Generally, the more severe fraud a firm commits; the greater likelihood corporate recidivism occurs.

Institutional ownership, state ownership, and managerial ownership are used as control variables. Institutional investors are sophisticated investors with managerial skills and professional knowledge, who may enhance the monitoring of management, reduce agency costs and limit repeated fraudulent behaviors (Gordon et al., 2013). Chinese listed firms normally have a highly concentrated ownership structure with state institutions acting as major blockholders (Habib and Jiang, 2015). As these firms have direct links with government agencies, they could escape serious sanctions (Wang and Yung, 2011). Subsequently, state ownership is controlled. Following Hass et al. (2016), we also include managerial ownership. We propose managers may benefit from fraudulent activities which inflate stock prices and the value of their equity-based compensation.

We also control for auditing, and board characteristics. We examine fraudulent firms which select larger auditors, as a proxy for high audit quality, as these firms may be more likely to be issued with modified audit opinions and caught by regulators (Chen et al., 2006). We control for big auditors by recording if a firm uses one of the big four auditors. As firms with greater board independence may be able to more effectively discipline managers (Beasley, 1996) we control for board independence. CEO duality is controlled as CEOs who act as the chairperson, will have more discretion to repeatedly falsify financial statements (Aggarwal et al., 2015). Board size is included as larger boards may contain more professionals who are expected to resist recidivist fraudulent behavior within the firm (Wang et al., 2019a).

We also include financial performance variables, including firm size, leverage, returns on equity (ROE) and profit growth rate. We control for firm size using the natural logarithm of firms’ total assets, as larger firms are better equipped to bear the expenses of monetary penalties and are expected to be more likely to re-offend (Shi et al., 2020). Financial leverage is controlled as this variable is closely monitored by regulators and may limit re-offending (Khanna et al., 2015). We also control the ROE and profit growth rate, as firms with relatively poor financial performance are more likely to manipulate financial statements. All corporate governance and financial control variables are lagged by one year to reflect the period of adjustment. Table 1 describes the variables, with descriptive statistics provided in Table 2.

We examine the relationship between recidivism and punishment using a probit model. This model includes a dichotomous dependent variable of whether a regulatory case is a repeat offence or otherwise. Independent variables are different forms of regulatory measures. Control variables include the duration and the number of frauds, and institutional ownership, state ownership, managerial ownership, big four auditor, board independence, CEO duality, board size, firm size, leverage, returns on equity and total profit growth. Each response to the dependent variable is: 1 = a repeat offence or 0 = a first offence with $Y_i = \begin{cases} 1 & \text{recidivist} \\ 0 & \text{one time fraudster} \end{cases}$ expressing respondent i ’s propensity to re-offend. Industry effect (α_i) is included. In some models, we further control time effect to test the robustness of the results. The probit model can be defined as the linear equation:

$$\text{Prob}(Y_i) = F(\beta_0 + \beta_i \text{ regulatory measures} + \gamma_i \text{ control variables} + \alpha_i + \varepsilon_i) \quad (1)$$

4. Results and discussion

4.1. Fraudulent financial reporting

Table 3 shows the distribution of financial statement fraud during the reporting period. Panel A reports how listed firms have manipulated income statements. The most commonly used methods include recording fictitious revenues, and recording fictitious

² Landis and Koch (1977) provide guidelines for interpreting Kappa values, with values from 0.81 to 1.0 indicating almost perfect or perfect agreement. Krippendorff’s alpha was interpreted by the guidelines suggested by Krippendorff (2011), with $\alpha \geq 0.800$ indicating good interrater coding reliability.

Table 1
Variable definition.

	Code	Full variable name	Description	Source
Reoffending	Recidivism	Recidivism	Equals one if a firm has committed fraud more than once; zero otherwise. <i>Note: repeat offence is coded as 1, first-time offence is coded 0</i>	Manual
	Self	Self-disciplinary measures	Equals one if a firm is subject to a self-disciplinary measure; zero otherwise	Manual
Punishments	Supervisory	Supervisory measures	Equals one if a firm is subject to a supervisory measure; zero otherwise	Manual
	Administrative	Administrative punishment	Equals one if a firm is subject to an administrative punishment; zero otherwise	Manual
Features of fraud cases	Fraud cases	Number of fraudulent cases	Total number of fraudulent cases committed by a firm	Manual
	Duration	Duration of fraud	Years from the first fraud year to the last fraud year	Manual
	State	State ownership	The number of shares held by state owners divided by the number of shares outstanding	CSMAR
	Institution	Institutional ownership	The number of shares held by institutional shareholders divided by the number of shares outstanding. In China, mutual fund is the largest institutional investor.	CSMAR
Institutional factors	Manager	Managerial ownership	The number of shares held by firm senior management divided by the number of shares outstanding	CSMAR
	Big 4	Big four auditors	Equals one if the firm is audited by a big four auditor; zero otherwise	CSMAR
	Independence	Board independence	The proportion of independent directors to total board of directors	CSMAR
	Duality	CEO duality	Equals one if a CEO also serves as the chairman; zero otherwise	CSMAR
	Board size	Board size	The number of members of the board of directors	CSMAR
	Firm size	Firm size	Natural logarithm of the firm's total assets	CSMAR
	Leverage	Leverage	Total liabilities divided by total assets	CSMAR
	ROE	Return on equity	The ratio of net profits divided by total equities	CSMAR
	Growth	Total profit growth	The ratio of annual change in total profits to total profits at the beginning of the year	CSMAR

Table 1 defines each variable and identifies the source of these variables. 'Manual' refers to the hand-collected dataset, and 'CSMAR' refers to the China Stock Market and Accounting Research (CSMAR) Database.

costs and expenses. When recording fictitious costs and expenses, the most frequent techniques are understating costs and expenses, delaying the recognition of costs and expenses and mis-classifying the costs and expenses. In 102 cases, firms record fictitious asset impairment losses. In 26 cases, firms falsify income statements by recording fictitious investment profits or losses. We also observe new fraud tactics to window-dress income statements under the adoption of new accounting standards. These include recording fictitious non-operating income or expenses and improper accounting practices for sales returns, rebates, and trade discounts.

Panel B reports the fraud methods used to falsify balance sheets. In most cases, firms record false assets and use false liabilities to manipulate the financial position of balance sheets. There are three cases of recording false equities. Improper accounting of assets commonly includes construction in the process not carrying forward as fixed assets and misclassifying non-current assets as current assets. The assets most frequently manipulated are monetary assets, inventories, accounts or other non-receivables. 'False liability valuation' accounts for approximately one-fifth of the total committed balance sheet frauds. There are 15 cases where firms misclassify journal entries of liabilities and record these using improper accounting practices.

Panel C describes cash flow statement fraud. A firm's cash flow is divided into operating, investing, and financing activities. Most fraudulent behaviors are related to firms not recognizing the sub-items under the three major cash flow activities. Panel D includes 47 cases of fraudulent financial reporting by improperly consolidating financial statements. Nearly 43% of the firms fail to bring subsidiaries into the scope of consolidation. 11 cases fail to eliminate their inter-company transactions when consolidating financial statements. Panel E reports 43 cases of failing to disclose the annual and interim reports in time.

Accounting standards require that financial statements and notes include all information necessary to prevent misleading reasonably discerning users of financial statements. Panel F records 'insufficient and false disclosure of information' is the most common type of fraud committed by the Chinese listed firms. These insufficient and false disclosures most frequently affect 'related party transactions', yet also cover investment status, guarantee events, accounting policies and accounting estimates. We also observe some fraud techniques rarely documented in the literature, including the insufficient and false disclosure of the internal control and corporate governance problems, customers and suppliers' information, assets which have not obtained ownership certificates or use rights and commitment events.

The major findings remain qualitatively similar when the samples are divided into non-reoffending and recidivist groups. However, differences exist with respect to the specific techniques used to manipulate financial statements. First-time offenders prefer falsifying financial reporting through insufficient or false disclosure of related party transactions, providing fictitious costs and expenses and insufficient or false disclosure of investment status. In contrast, repeat offenders apply insufficient or false disclosure of related party transactions, fictitious costs and expenses and fictitious revenue recognition. In addition, recidivists are more likely to commit income statement fraud. In other words, first-time offenders tend to undertake more disclosure fraud, whilst repeat offenders manipulate recognized information such as income statements, balance sheets and cash flow statements. This may arise as disclosed information is easier to manipulate, and auditors are less tolerant of misstatements of recognized than disclosed information (Michels, 2017). Equally, when firms repeatedly commit fraud, their methods for doing so become more complex and less transparent. We note the delayed disclosure of annual reports also increases in the recidivist group. As fraudulent firms are subject to legal penalties or

Table 2
Panel A: Descriptive statistics.

Variables	Mean	Median	S.D.	Min	Max
Recidivism	0.320	0	0.467	0	1
Self	0.168	0	0.374	0	1
Supervisory	0.592	1	0.491	0	1
Administrative	0.240	0	0.427	0	1
Fraud cases	2.206	2	1.532	1	11
Duration	2.788	2	2.414	0.5	17
State	0.078	0	0.166	0	0.712
Institution	0.265	0.195	0.234	0.000	0.812
Manager	0.039	0.000	0.104	0	0.534
Big4	0.146	0	0.353	0	1
Independence	0.372	0.333	0.054	0.3	0.571
Duality	0.194	0	0.396	0	1
Board size	8.962	9	1.879	5	16
Firm size	22.057	21.999	1.398	18.674	25.979
Leverage	0.530	0.520	0.282	0.063	2.133
ROE	0.059	0.066	0.163	-0.901	0.467
Growth	1.059	-0.040	12.186	-43.670	80.060

Panel B: Comparison between recidivism group and non-recidivism group.

Variables	Non-recidivism group Mean	Recidivism group Mean	Mean Difference
Recidivism	0.000	1.000	-1.000
Self	0.134	0.242	-0.108***
Supervisory	0.655	0.468	0.188***
Administrative	0.201	0.322	-0.121***
Fraud cases	2.179	2.217	-0.038
Duration	2.657	2.980	-0.323**
State	0.082	0.069	0.014
Institution	0.243	0.312	-0.070
Manager	0.037	0.043	-0.006
Big4	0.125	0.190	-0.065***
Independence	0.372	0.371	0.002
Duality	0.202	0.177	0.025
Board size	8.889	9.117	-0.229*
Firm size	21.919	22.350	-0.430***
Leverage	0.526	0.539	-0.013
ROE	0.061	0.055	0.006
Growth	1.728	-0.416	2.144**

Panel A presents the descriptive statistics for the overall sample, with 1010 firm-year observations (i.e. sanction decisions) in total. Panel B compares the mean value of each variable between recidivism sub-group (323 firm-year observations) and non-recidivism subgroup (687 firm-year observations).

reputation losses after their first punishment, managers have incentives to delay the disclosure of bad news relating to firm earnings.

4.2. Punishments of fraud

Punishments are recorded in Table 4 (Panel A). Warnings and fines are administrative sanctions, are highly correlated and used in combination and account for approximately 31.5% of total punishments. The average fines imposed on fraudulent firms have increased, from 313,333 Yuan in 2007 to 539,000 Yuan in 2019 (about \$45,350 to \$78,000). These monetary penalties are capped at 600,000 Yuan (about \$87,000) by Chinese Securities Law³ and are considerably lower than the level of fines observed in US markets. Repaying tax is a rarely used administrative punishment imposed by the MOF. We also record supervisory measures including rectification notices, regulatory concerns, letters of warning, public statements, and regulatory interviews. Rectification notices are primarily issued by CSRC regional offices and are the most frequently used supervisory punishment accounting for approximately 38% of the sample. Regulatory interviews and public statement orders are seldom used and account for 1% of punishments. Self-regulatory measures imposed by the two stock exchanges include public criticism, public condemnation, verbal warnings, and business suspension. Verbal warnings and business suspension are seldom used punishments.

Table 4 examines the features of re-offending. We report that approximately 32% of offending firms are charged with financial

³ China's Securities Law was significantly revised in December 2019. This revision took effect in March 2020. The revised Securities Law contains stricter rules against false information disclosure. For instance, the maximum fines imposed on fraudsters were increased to RMB10 million (about US\$1.45 million) (Zhang, 2020).

Table 3
Types of fraudulent financial reporting (2007–2019).

Types of fraudulent financial reporting	Total	Recidivism	%	Non-recidivism	%
Panel A: False Income Statement					
Fictitious revenue recognition	180	81	11.23%	99	6.57%
Fictitious operating costs and expenses recognition	218	75	10.40%	143	9.49%
Fictitious asset impairment losses recognition	102	27	3.74%	75	4.98%
Fictitious investment profits and losses recognition	26	8	1.11%	18	1.19%
Improper accounting for sales returns, trade discounts and rebates	18	6	0.83%	12	0.80%
Fictitious non-operating income and expenses recognition	38	15	2.08%	23	1.53%
Others	27	6	0.83%	21	1.39%
Panel B: False Balance Sheet					
Timing difference recognition of assets	7	1	0.14%	6	0.40%
False asset valuation	101	40	5.55%	61	4.05%
Mis-classification and improper accounting for assets	94	22	3.05%	72	4.78%
Timing difference recognition of liabilities	3	0	0.00%	3	0.20%
False liabilities valuation	49	11	1.53%	38	2.52%
Mis-classification and improper accounting for liabilities	15	4	0.55%	11	0.73%
False equities valuation	3	0	0.00%	3	0.20%
Panel C: False Cash Flow Statement					
False cash flow relating to operating activities	8	2	0.28%	6	0.40%
False cash flow relating to investing activities	5	0	0.00%	5	0.33%
False cash flow relating to financing activities	4	1	0.14%	3	0.20%
False cash, cash equivalents and cash flow supplement materials	13	3	0.42%	10	0.66%
Panel D: Improper financial statement consolidation					
Not bringing a subsidiary in the scope of consolidation	20	11	1.53%	9	0.60%
Internal transactions not fully eliminated	11	3	0.42%	8	0.53%
Bringing a subsidiary which the parent firm has loss of control	5	2	0.28%	3	0.20%
Others	11	4	0.55%	7	0.46%
Panel E: Delayed disclosure of annual and interim reports					
	43	28	3.88%	15	1.00%
Panel F: Insufficient and false disclosure of information					
Related party transactions	344	101	14.01%	243	16.12%
Investment status	98	25	3.47%	73	4.84%
Financial status and operating results in the director report	31	11	1.53%	20	1.33%
Mortgage, seal and freeze of assets or equities and restricted assets	41	17	2.36%	24	1.59%
Assets that haven't obtained the ownership certificates or use rights	16	6	0.83%	10	0.66%
Receivables or payables by types, amounts and risks	42	10	1.39%	32	2.12%
Contracts and the fulfilment of contracts	39	10	1.39%	29	1.92%
Guarantee events	114	38	5.27%	76	5.04%
Lawsuits events	43	22	3.05%	21	1.39%
Commitment events	18	5	0.69%	13	0.86%
Directors, supervisors and senior management information	48	16	2.22%	32	2.12%
Accounting policies and accounting estimates	88	22	3.05%	66	4.38%
Customers and suppliers	30	11	1.53%	19	1.26%
Shareholders, shareholding and actual controllers	80	28	3.88%	52	3.45%
Internal control and corporate governance	18	8	1.11%	10	0.66%
External loans events	36	9	1.25%	27	1.79%
Others	141	32	4.44%	109	7.23%
Total	2228	721	100.0%	1507	100.0%

Non-recidivism refers to the fraud techniques used by first-time offenders. Recidivism refers to the fraud techniques used by the repeat offenders.

statement fraud more than once. In Panel B, we report 68 fraudulent firms are punished more than twice and 24 firms are punished more than three times. Panel C details the interval between each punishment for repeat offenders. Nearly 54% of recidivists re-offend within two years. The type and incidence of punishments imposed on recidivists between their first and subsequent offences are shown in Panel D. While rectification notices are frequently imposed for both first-time and repeat offences, the use of warnings and fines increases dramatically for repeat offenders. This suggests that previous offences may justify incremental additions for the later punishment.

4.3. Regression results

We report the results from the probit model in Table 5. In Model 1, self-disciplinary measures are positively and significantly related to the likelihood of recidivism. This indicates when self-disciplinary measures are imposed on offenders, re-offending is increased. In Model 2, we re-run the regression model, controlling for time effect, and reporting consistent findings.

Table 4
Punishments and recidivism.

Panel A: Recidivism and punishments						
Recidivism and punishments						
	Punishment	Warning	Fines	Repay tax	Rectification notice	Regulatory concern
count	No recidivism	101	133	1	355	103
	Recidivism	103	104	0	171	25
	Total	204	237	1	526	128
%	No recidivism	10	13.168	0.099	35.149	10.198
	Recidivism	10.198	10.297	0	16.931	2.475
	Pearson χ^2	40.264***	20.165***	0.471	0.141	10.443**
	Punishment	Letter of warning	Public statement	Regulatory interview	Criticism	Condemnation
count	No recidivism	71	5	5	58	40
	Recidivism	33	2	3	31	51
	Total	104	7	8	89	91
%	No recidivism	7.03	0.495	0.495	5.743	3.96
	Recidivism	3.267	0.198	0.297	3.069	5.05
	Pearson χ^2	0.003	0.038	0.113	0.365	26.623**
	Punishment	Verbal warning	Business suspension			
count	No recidivism	0	0			
	Recidivism	3	2			
	Total	3	2			
%	No recidivism	0	0			
	Recidivism	0.297	0.198			
	Pearson χ^2	6.400**	4.262**			

Panel B: The times of punishments that fraudulent firms receive						
Number of sanctions	1	2	3	4	> = 5	Total
Number of fraudulent firms	464	155	44	19	5	687
Percentage (%)	67.540%	22.562%	6.405%	2.766%	0.728%	100.000%

Panel C: The interval between each punishment of the recidivists						
Interval	<=1 year	2 years	3 years	4 years	5 years	> =6 years
Number of firm-year observations	98	77	53	27	29	39
Percentage (%)	30.34	23.84	16.41	8.36	8.98	12.08

Panel D: Types of punishments for recidivists				
Types of punishments	Incidence of punishments		Percentage (%)	
	First-time	Recidivism	First-time	Recidivism
Warning	34	103	11.806%	19.508%
Fines	44	104	15.278%	19.697%
Repay tax	0	0	0.000%	0.000%
Rectification notice	125	171	43.403%	32.386%
Regulatory concern	24	25	8.333%	4.735%
Letter of warning	16	33	5.556%	6.250%
Public statement	1	2	0.347%	0.379%
Regulatory interview	0	3	0.000%	0.568%
Public criticism	24	31	8.333%	5.871%
Public condemnation	20	51	6.944%	9.659%
Verbal warning	0	3	0.000%	0.568%
Business suspension	0	2	0.000%	0.379%

No recidivism (%) is the ratio of the number of punishments imposed on first-time offenders to the total number of observations. Recidivism (%) is the ratio of the number of punishments imposed on repeat offenders to the total number of observations. Regulators can impose one or multiple punishments on fraudulent firms depending on the severity of fraud. In Panel C, the interval of each punishment imposed on recidivists is calculated as the time period between prior sanction date and current sanction date. Panel D compares the types of punishments imposed on recidivists between recidivists' first-time offending and their re-offending.

In Model 3, we report supervisory measures are significantly and negatively associated with recidivism. These supervisory measures are imposed by the CSRC regional offices to address moderately severe cases, and it is observed that they appear to be effective in constraining recidivism. Again, this result remains unchanged when we control for time, in Model 4.

In Model 5, we report that administrative punishments have significant impact on reducing corporate recidivism. As administrative

Table 5
Baseline regression results.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Self	0.444*** (0.058)	0.359*** (0.119)					0.416*** (0.129)	
Supervisory			-0.454*** (0.060)	-0.441*** (0.102)				-0.415*** (0.130)
Administrative					-4.502*** (0.154)	-3.860*** (0.190)	-4.501*** (0.265)	-4.172*** (0.220)
Fraud cases	0.029 (0.022)	0.049* (0.030)	0.032 (0.023)	0.053* (0.030)	0.016 (0.022)	0.041 (0.030)	0.047* (0.028)	0.050* (0.030)
Duration	0.026 (0.020)	0.033* (0.018)	-0.003 (0.023)	0.007 (0.020)	0.010 (0.017)	0.019 (0.020)	0.013 (0.017)	0.007 (0.020)
State	-0.456*** (0.156)	0.442 (0.308)	-0.476*** (0.150)	0.459 (0.310)	-0.420*** (0.138)	0.462 (0.309)	-0.443 (0.278)	-0.450 (0.311)
Institution	-0.822*** (0.149)	0.752 (0.738)	-0.752*** (0.151)	0.808 (0.741)	-0.715*** (0.201)	0.878 (0.738)	0.883 (0.755)	0.855 (0.741)
Manager	0.559 (0.360)	0.705* (0.409)	0.527 (0.422)	0.707* (0.412)	0.516 (0.403)	0.671 (0.408)	0.701 (0.491)	0.703* (0.413)
Big4	0.207** (0.081)	0.084 (0.130)	0.181** (0.082)	0.071 (0.130)	0.172** (0.082)	0.054 (0.129)	0.068 (0.128)	0.063 (0.130)
Independence	-0.929 (0.794)	-0.429 (0.908)	-0.850 (0.784)	-0.338 (0.917)	-0.740 (0.766)	-0.270 (0.906)	-0.281 (1.071)	-0.316 (0.917)
Duality	-0.092* (0.051)	-0.090 (0.118)	-0.112** (0.055)	-0.102 (0.119)	-0.106** (0.044)	-0.099 (0.120)	-0.093 (0.116)	-0.107 (0.119)
Board size	0.001 (0.017)	0.039 (0.028)	-0.003 (0.014)	0.038 (0.028)	-0.002 (0.017)	0.035 (0.028)	0.036 (0.023)	0.037 (0.028)
Firm size	0.179*** (0.027)	0.004 (0.042)	0.172*** (0.027)	-0.005 (0.042)	0.179*** (0.029)	0.002 (0.042)	-0.004 (0.045)	-0.004 (0.042)
Leverage	-0.300 (0.319)	0.201 (0.237)	-0.242 (0.293)	0.258 (0.236)	-0.230 (0.315)	0.273 (0.239)	0.242 (0.162)	0.258 (0.236)
ROE	-0.298* (0.166)	-0.182 (0.342)	-0.334* (0.186)	-0.197 (0.349)	-0.272* (0.149)	-0.143 (0.340)	-0.185 (0.495)	-0.190 (0.349)
Growth	-0.012*** (0.004)	-0.011** (0.005)	-0.011*** (0.004)	-0.010** (0.005)	-0.010*** (0.004)	-0.010** (0.005)	-0.010** (0.005)	-0.010** (0.005)
Constant	-4.360*** (0.350)	-0.650 (0.929)	-3.750*** (0.337)	-0.158 (0.939)	-4.329*** (0.306)	-0.638 (0.933)	-0.605 (1.189)	-0.198 (0.943)
Industry effect	Yes		Yes		Yes		Yes	Yes
Time effect		Yes		Yes		Yes	Yes	Yes
Pseudo R ²	0.062	0.106	0.068	0.114	0.062	0.108	0.118	0.117
Observations	946	915	946	915	946	915	915	915

Table 5 presents the results of the simple probit model. Models 1–2, 3–4 and 5–6 examine the impact of self-regulatory measures, supervisory measures and administrative measures on corporate recidivism respectively. Model 7 controls both self-regulatory and administrative measures, and Model 8 controls both supervisory and administrative measures. The sanction measure groups (i.e., self-regulatory measures, supervisory measures and administrative measures) are mutually exclusive. All the variables are defined in Table 1. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels respectively. The standard errors are adjusted for firm-level clustering.

measures are the strongest sanctions designated to address severe offences (Chen et al., 2011), this result is aligned with prior expectations. Moreover, the magnitude of the coefficient for ‘administrative punishment’ is greater than the coefficient for ‘supervisory measures’.⁴ Consequently, we conclude the benefits arising from recidivism are outweighed by the cost of administrative punishments. This outcome significantly reduces the incidence of corporate recidivism. Our results remain robust, when we control for time in Model 6.

As these different types of punishments are mutually exclusive, we control for ‘self-regulatory’ and ‘administrative’ measures, whilst using ‘supervisory measures’ as a reference group in Model 7. It is observed that self-disciplinary measures result in an increase in re-offending behaviors, while administrative measures significantly reduce recidivism. Similarly, in Model 8, we control for ‘supervisory’ and ‘administrative’ measures together whilst using ‘self-regulatory measures’ as a reference group. The results remain consistent with our main findings.

Deterrence is one of the primary goals of punishments. Our paper discovers self-regulatory punishments fail to deter future fraudulent behaviors. We suggest this occurs due to the non-severe nature of the punishment. Subsequently, regulators should realize that self-regulatory measures do not have sufficient deterrence functions when addressing Chinese financial statement fraud. Our findings contrast with previous studies such as Coffee Jr et al. (2015), which argue self-regulators are more effective than government regulators when addressing fraud. Clearly, the evidence offered in our paper indicates that investor protection provided by the self-regulatory forces have functional limitations. Therefore, self-regulatory measures should not be adopted when addressing recidivism.

We also provide consistent evidence that supervisory measures and administrative penalties provide a significant deterrence to

⁴ The results of marginal effect analysis in the section 4 are available upon request.

reoffending. Firms perceive that these punishments provide sufficient disutility to outweigh gains from fraud (Wang et al., 2019b). The government source of these punishments (the CSRC and its regional offices), rather than the non-government self-regulatory institutions may partially explain this outcome. Subsequently, firm management perceives these as more serious penalties (Gong et al., 2021). In conclusion, regulators should use supervisory and administrative measures rather than self-regulatory measures when combating corporate recidivism.

Some of our control variables also provide significant findings. Institutional ownership is negatively related to recidivism in Models 1, 3 and 5, indicating that firms with larger institutional shareholders are less likely to commit fraud. Firms with high level of institutional investment are believed to enhance the monitoring of management (Gordon et al., 2013), reducing the information asymmetry and consequently, the incidence of recidivism. Managerial ownership is positively associated with recidivism in some of the models. In other words, managers' equity incentives increase their propensity to commit recidivism. This can be explained by the fact that fraudulent behaviors can increase firm stock prices and the value of managers' shareholdings (Hass et al., 2016). Subsequently, managers reoffend to maximize their personal benefits. State ownership is negatively and significantly related to recidivism in some of the models, implying fraudulent firms with a large proportion of state ownership are less likely to be detected by regulators. This confirms government support for firms with larger state ownership reduces the likelihood of detection for recidivism. This will damage minority shareholders' interests in these firms (Wang et al., 2022b).

4.4. Robustness tests

4.4.1. Bivariate probit model

We also undertake robustness tests to address partial observability, the channels of influence, firm-level heterogeneity and endogeneity concerns. Firstly, issues of partial observability arise as a single probit or logit model only captures the joint probability of a repeat offence being committed and detected, while two latent processes underlie recidivism: listed firms that commit recidivism and

Table 6
Robustness test: Bivariate probit model.

Variables	Model 1		Model 2		Model 3	
	P(F)	P(D F)	P(F)	P(D F)	P(F)	P(D F)
Self	0.515*** (0.117)					
Supervisory			-0.549*** (0.101)			
Administrative					-1.440** (0.668)	
Fraud cases	0.033 (0.024)		0.038 (0.046)		0.030* (0.018)	
Duration	0.036** (0.018)		0.001 (0.019)		0.023 (0.025)	
State	-0.527*** (0.148)		-0.486* (0.272)		-0.192 (0.186)	
Institution	-0.986*** (0.344)		-0.928* (0.474)		-0.718** (0.320)	
Manager	0.928 (0.666)		0.907* (0.475)		0.885 (0.619)	
Independence	-1.064 (0.926)		-0.941 (0.925)		-1.037 (0.847)	
Duality	-0.124** (0.060)		-0.144 (0.114)		-0.128** (0.058)	
Board size	0.007 (0.031)		0.007 (0.024)		0.008 (0.023)	
Big4		0.950 (0.578)		1.139* (0.630)		1.199 (0.738)
Firm size		0.409*** (0.087)		0.461*** (0.117)		0.473*** (0.104)
Leverage		0.115 (0.584)		0.273 (0.529)		0.442 (0.608)
ROE		-0.822* (0.481)		-1.027 (0.681)		-1.034* (0.531)
Growth		-0.022*** (0.004)		-0.024*** (0.006)		-0.024*** (0.004)
Constant	-0.034 (0.281)	-8.494*** (1.636)	0.450 (0.346)	-9.598*** (2.576)	0.833** (0.405)	-9.928*** (2.085)
Industry effect	Yes		Yes		Yes	
Observations	946	946	946	946	946	946

Table 6 examines the impact of different regulatory measures on corporate recidivism using the bivariate probit model. P(F) is the probability of recidivism commission and P(D|F) is the probability of recidivism detection conditional on recidivism commitment. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels.

firms which are caught by regulators. This is a bias when analyzing financial crime, with optimistically only a quarter of financial crimes ever caught by regulators (Ashton et al., 2021). Indeed, most assessments overlook this partial observability issue, where the majority of firms which have offended but have not been caught (Wang et al., 2019a). We use a bivariate probit model to address this concern.

We follow Wang (2013) and Wang et al. (2022b) to develop a bivariate probit model. The dependent variable is recidivism commission which is equal to one if a firm commits recidivism and zero otherwise. To apply the bivariate probit model, another dependent variable 'recidivism detection' is introduced. This variable is equal to one if a firm is repeatedly subject to sanction decisions imposed by regulators and zero otherwise. We include the following variables in the commission equation, including the number of fraud cases, duration of fraud, state ownership, institutional ownership, managerial ownership, board independence, board duality and board size. Most of these variables are related to corporate governance features, as a firm's governance mechanism is more likely to affect corporate insiders' propensity to repeatedly commit fraud rather than triggering regulatory investigations. This is particularly the case in China, where boards of directors are more likely to limit recidivism through private meetings rather than reporting concerns to regulators. Financial variables including firm size, leverage, ROE and profit growth rate are included in the detection equation as poor financial performance is more likely to trigger regulatory investigations (Wang et al., 2022b). In addition, big 4 auditor is controlled in the detection equation.

Table 7
Robustness test: Channel of regulatory measures' influence.

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Self	0.002 (0.002)					
Self*Cost		3.202*** (0.749)				
Supervisory			0.002** (0.001)			
Supervisory*Cost				-2.285*** (0.678)		
Administrative					0.004* (0.002)	
Administrative*Cost						-3.086* (1.854)
Fraud cases		0.017 (0.022)		0.020 (0.023)		0.030 (0.019)
Duration		0.001 (0.024)		-0.016 (0.029)	-0.001* (0.001)	-0.028 (0.038)
State	0.005* (0.003)	-0.162 (0.172)	0.005* (0.003)	-0.160 (0.164)	0.005** (0.003)	-0.012 (0.142)
Institution	-0.006 (0.007)	-1.298*** (0.481)	-0.006 (0.007)	-1.237*** (0.427)	-0.006 (0.006)	-1.304*** (0.463)
Manager	0.003 (0.002)	1.111*** (0.390)	0.003 (0.002)	0.980** (0.419)	0.003 (0.002)	0.896** (0.353)
Big4	-0.002** (0.001)	0.202* (0.112)	-0.002** (0.001)	0.176* (0.104)	-0.002** (0.001)	0.197* (0.105)
Independence	0.019** (0.008)	-0.855* (0.481)	0.019** (0.008)	-0.803* (0.436)	0.019** (0.008)	-1.078** (0.438)
Duality	-0.001 (0.001)	-0.156 (0.125)	-0.001 (0.001)	-0.157 (0.123)	-0.001 (0.001)	-0.202 (0.148)
Board size	0.002*** (0.001)	0.005 (0.015)	0.002*** (0.001)	0.002 (0.015)	0.002*** (0.001)	-0.007 (0.017)
Firm size	-0.001*** (0.001)	0.183*** (0.035)	-0.001*** (0.001)	0.182*** (0.037)	-0.001*** (0.001)	0.169*** (0.041)
Leverage	-0.001 (0.001)	0.014*** (0.004)	-0.001 (0.001)	0.012*** (0.004)	-0.001 (0.001)	0.008 (0.006)
ROE	0.001 (0.001)	0.050 (0.092)	0.001 (0.001)	0.050 (0.096)	0.001 (0.001)	0.046 (0.093)
Growth	0.001*** (0.001)	-0.002 (0.003)	0.001*** (0.001)	-0.002 (0.002)	0.001 (0.001)	-0.002 (0.002)
Constant	0.107*** (0.008)	-4.802*** (0.733)	0.107*** (0.008)	-4.442*** (0.714)	0.107*** (0.008)	-2.992*** (0.714)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.042		0.007		0.008	
Pseudo R ²		0.062		0.062		0.081
Observations	12,536	572	12,536	572	12,536	569

Table 7 examines the channel that different regulatory measures affect corporate recidivism. Cost is defined as the cost of capital required by equity shareholders, and it is calculated using the price-earnings-to-growth ratio (PEG) model. For Models 1, 3 and 5, the dependent variable is the cost of equity capital. For Models 2, 4 and 6, the dependent variable is recidivism. In Models 1, 3 and 5, the sample includes both fraudulent and non-fraudulent firm-year observations. All the variables are defined in **Table 1**. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels respectively.

The results are reported in Table 6. In Model 1, a positive relationship between self-regulatory measures and corporate recidivism commission is observed. In Models 2 and 3, we report a negative relationship between supervisory measures and recidivism commission, and administrative punishments and recidivism commission respectively. We note the coefficient estimates for ‘administrative punishment’ are greater than that of the ‘supervisory measure’, in line with our previous findings.

4.4.2. Channel of influence

A relationship between fraud severity and the cost of capital may exist, where firms which commit severe fraud incur higher costs of equity capital during the post-punishment enforcement period (Wang et al., 2022a). These higher costs of capital arise from reputational concerns which lower shareholders’ perceptions of fraudulent firms’ future cash flows and earnings. Following Wang et al. (2022a), we examine the channel that different regulatory approaches affect recidivism. More specifically, we test whether shareholders require different levels of cost of equity capital for firms subject to different types of punishments, and if this process further affects the occurrence of financial recidivism.

To calculate the cost of capital required by equity shareholders, we follow Easton (2004)’s Price–Earnings–Growth (PEG) approach. In this model, represented below, the cost of equity capital is a function of a firm’s current share price, and one and two-year-ahead earnings forecast ratios.

$$R_{PEG} = \sqrt{\frac{EPS_2 - EPS_1}{P}} \quad (2)$$

where EPS_1 is the expected earnings per share in the next year, EPS_2 is the expected earnings per share at two-year period ahead of the current date, and P is the current share price.

The results are presented in Table 7. In Model 1, the dependent variable is the cost of equity, and the independent variable is the self-regulatory measure. We include ownership, board characteristics and financial performance control variables.⁵ An insignificant relationship between self-regulatory measures and cost of capital required by equity shareholders is reported. Therefore, when firms are punished through self-regulatory measures, the shareholders regard these fraud cases as minor offences and do not increase the cost of equity. In Model 2, we re-estimate our baseline regression results using the interaction variable Self*Cost (self-regulatory measures multiplied by the cost of equity) as the main independent variable. We report a significant and positive relationship between self-regulatory measures and corporate recidivism, when considering the cost of equity as a channel of influence. That is, when firms perceive shareholders are less likely to demand higher cost of equity, they have greater incentives to re-offend.

Similarly, we examine firms subject to supervisory measures. In Model 3, we report there is a positive relationship between supervisory measures and cost of equity (with a coefficient of 0.002). When firms are punished using supervisory measures by the regional offices, shareholders are likely to demand a higher cost of equity. In Model 4, we examine if the joint effect of supervisory measures and cost of equity negatively affect the occurrence of corporate recidivism. We report that due to the more severe nature of supervisory measures, investors demand a higher payoff in these cases, with fraudulent firms less likely to re-offend.

In Models 5 and 6, we examine this channel of influence for firms subject to administrative punishments. In Model 5, a significantly positive relationship between administrative punishments and cost of equity (a coefficient of 0.004) is reported. We propose this finding occurs as shareholders of firms punished using administrative measures are likely to demand the highest costs of equity. This outcome translates into lower incentives to re-offend, as evidenced in Model 6.

4.4.3. Firm-level heterogeneities: Firm ownership and fraud intensity

This section examines how firm-level characteristics, including ownership and fraud intensity influence the relationship between self-regulatory measures and corporate recidivism. First, we divide the data set into two sub-samples representing state-owned enterprises (SOEs) and non-SOEs based on the ultimate controller of listed firms. Specifically, SOEs is a dummy variable that equals one if the ultimate controller of a listed firm is a state institution and zero otherwise. Models 1–2 of Table 8 present the results. We report there is a significant and positive relationship between self-regulatory measures and financial recidivism in both fraudulent SOEs and non-SOEs sub-samples. However, the marginal effects’ magnitude of self-regulatory measures in non-SOEs group is higher than that of the SOEs group. This is consistent with the notion that SOEs have greater access to financial resources and have relatively lower incentives to repeatedly manipulate financial statements (Wang et al., 2022b). In contrast, non-SOEs, when facing less severe self-disciplinary punishments and greater financial pressures, are more likely to re-offend.

Second, we explore the association between self-regulatory measures and recidivism whilst incorporating the factor of fraud intensity. Fraud intensity is defined as a dummy variable that equals to one if the number of fraud cases that a firm committed is more than the sample median value and zero otherwise. We then divide the sample into two sub-groups, including high fraud intensity and low fraud intensity sub-groups. The results are reported in Models 3–4 of Table 8. It is observed that there is a significant and positive relationship between self-regulatory measures and recidivism in both high and low fraud intensity sub-samples. We note the marginal effects’ magnitude of self-regulatory measures in the high intensity sub-group is greater than that of the low intensity sub-group. This implies firms which have committed more fraud cases and received non-severe sanctions are more likely to re-offend.

⁵ In Models 1, 3 and 5, we include both fraudulent and non-fraudulent firm-year observations.

Table 8
Robustness test: firm-level heterogeneities by ownership and fraud intensity.

Variables	Model 1	Model 2	Model 3	Model 4
	SOEs	Non-SOEs	High intensity	Low intensity
Self	0.380*** (0.123)	0.550*** (0.092)	0.547*** (0.116)	0.449*** (0.159)
Fraud cases	0.013 (0.044)	0.067*** (0.019)		
Duration	0.018 (0.033)	0.041* (0.025)	0.001 (0.023)	0.051** (0.022)
State	-0.473* (0.247)	-3.434*** (1.626)	0.028 (0.318)	-1.256*** (0.359)
Institution	-1.042 (1.195)	-1.083** (0.443)	-1.543** (0.651)	-0.473 (1.033)
Manager	-2.262 (2.651)	0.595 (0.405)	0.525 (0.605)	0.736 (0.453)
Big4	0.286* (0.147)	0.136 (0.150)	0.131 (0.194)	0.285* (0.161)
Independence	0.152 (1.007)	-2.765*** (1.187)	-1.479 (1.420)	0.178 (1.385)
Duality	-0.078 (0.308)	-0.049 (0.164)	0.017 (0.125)	-0.230 (0.161)
Board size	0.038 (0.026)	-0.039* (0.021)	0.027 (0.021)	0.008 (0.030)
Firm size	0.156* (0.086)	0.217*** (0.021)	0.195*** (0.047)	0.167*** (0.053)
Leverage	-0.465 (0.320)	0.015*** (0.006)	0.011 (0.018)	-0.263 (0.234)
ROE	-0.025 (0.032)	-0.180 (0.229)	-0.034 (0.038)	-0.327 (0.469)
Growth	-0.001 (0.002)	-0.005 (0.004)	-0.005 (0.004)	-0.002* (0.001)
Constant	-3.965* (2.034)	-3.324*** (0.381)	-5.286*** (1.276)	-3.739*** (1.474)
Industry effect	Yes	Yes	Yes	Yes
Pseudo R ²	0.067	0.101	0.067	0.100
Observations	484	452	522	424

Table 8 examines the impact of different regulatory measures on corporate recidivism whilst considering firm-level heterogeneities, including ownership nature and fraud intensity. Model 1 presents the results of SOEs sub-sample, and Model 2 presents the results of non-SOEs sub-sample. SOE is a dummy variable that equals one if the ultimate controller of a listed firm is the state owner and zero otherwise. Model 3 presents the results of high fraud intensity sub-group, and Model 4 presents the results of low fraud intensity sub-group. Fraud intensity is a dummy variable that equals one if the number of fraud cases that a firm committed is more than the sample median value and zero otherwise. All the variables are defined in **Table 1**. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels respectively.

4.4.4. Firm-level heterogeneities: Big auditor and dual listing

This section examines how auditing providers and dual listings influence the relationship between different regulatory measures and corporate recidivism. In addition, we select big 10 auditors to replace big 4 auditors to further test the robustness of results. One of the reasons is that the market share of the big four accounting firms in the Chinese audit market is relatively limited, we therefore examine the big 10 accounting firms in China, which have a market share of over a third of the auditing market (Zhu et al., 2016). We divide samples into firms audited by the ten big accounting firms, and those firms that are not, with the big auditor variable equalling one if a listed firm is audited by one of the big 10 accounting firms, and zero otherwise.⁶ In addition, we introduce a control variable ‘dual listing’ to capture the impact of dual-listed firms on the occurrence of corporate recidivism. Dual listing is a dummy variable that equals to one if a firm is dual listed in A-share market and H- or B-share market, and zero otherwise. It is reported that about 8.33% firms in our sample are cross listed on the stock exchanges.

Models 1–2 of **Table 9** present the results as to the impact of self-regulatory measures on corporate recidivism for firms audited by the big ten auditors or otherwise. There is no significant relationship between the self-disciplinary measures and financial recidivism for firms which hire big ten auditors (Model 1), as opposed to the positive relationship reported for firms which do not hire big ten auditors (Model 2). These results are consistent with our expectations that firms audited by larger accounting firms are subject to stricter external monitoring, limiting their incentives to repeatedly engage in fraud (Wang et al., 2019a).

In addition, we report that the coefficient estimate of ‘dual-listing’ is significantly negative in Model 1. This indicates that firms

⁶ We select big 10 auditors to replace big 4 auditors to examine the robustness of results and divide samples for the following reasons. Firstly, we will be able to obtain a more balanced sub-sample size. Secondly, according to Zhu et al. (2016), big four accounting firms only enjoy around 6% of the Chinese auditing market share and the Chinese government has worked hard to promote top domestic accounting firms and big 10 accounting firms in China, which cover more than one third of the auditing market share.

Table 9
Robustness test: firm-level heterogeneities by auditing quality and dual listing.

Variables	Big auditor	Non-Big auditor	Big auditor	Non-Big auditor	Big auditor	Non-Big auditor
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Self	0.147 (0.199)	0.419*** (0.162)				
Supervisory			-0.385*** (0.143)	-0.482*** (0.149)		
Administrative					-1.006* (0.603)	-6.205*** (1.465)
Dual listing	-0.421** (0.199)	0.202 (0.280)	-0.354** (0.147)	0.199 (0.296)	-0.388* (0.218)	0.314 (0.295)
Fraud cases	-0.033 (0.060)	0.029 (0.038)	0.034 (0.054)	0.023 (0.038)	-0.046 (0.048)	0.053 (0.041)
Duration	0.059* (0.031)	0.006 (0.025)	0.027 (0.033)	-0.009 (0.029)	0.027 (0.023)	0.011 (0.029)
State	0.392 (0.563)	-0.286 (0.395)	0.129 (0.362)	-0.194 (0.433)	0.555 (0.553)	-0.099 (0.443)
Institution	0.296 (1.561)	-0.142 (0.891)	0.107 (0.880)	-0.484 (0.926)	0.667 (1.378)	0.094 (0.981)
Manager	1.494 (1.009)	-0.328 (0.564)	1.379 (0.851)	-0.339 (0.603)	1.689* (0.893)	-0.149 (0.614)
Independence	-0.865 (1.659)	-0.267 (1.191)	-0.739 (1.305)	0.724 (1.266)	-1.084 (1.192)	-0.680 (1.259)
Duality	-0.258 (0.195)	0.164 (0.161)	-0.258* (0.152)	0.151 (0.166)	-0.293 (0.179)	0.202 (0.166)
Board size	0.120* (0.062)	-0.018 (0.035)	0.098** (0.041)	0.001 (0.037)	0.116** (0.059)	-0.040 (0.037)
Firm size	-0.029 (0.074)	0.200*** (0.054)	-0.006 (0.056)	0.198*** (0.057)	-0.043 (0.073)	0.224*** (0.064)
Leverage	-0.054 (0.507)	0.092 (0.068)	-0.213 (0.377)	0.101 (0.076)	0.035 (0.411)	0.284* (0.152)
ROE	-1.246** (0.490)	0.105 (0.150)	-0.903* (0.489)	0.126 (0.152)	-1.175*** (0.367)	0.075 (0.124)
Growth	-0.001 (0.003)	-0.001 (0.002)	-0.002 (0.001)	-0.001 (0.001)	-0.001** (0.001)	-0.001 (0.001)
Constant	2.788 (1.775)	-4.972*** (1.224)	1.299 (1.207)	-4.932*** (1.348)	3.250** (1.328)	-4.451*** (1.411)
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.215	0.055	0.148	0.103	0.232	0.129
Observations	406	485	435	467	406	480

Table 9 examines the impact of different regulatory measures on corporate recidivism whilst considering firm-level heterogeneities i.e., auditing quality and dual listing. Big auditor is a dummy variable that equals one if a listed firm is audited by one of the big ten accounting firms in China, and zero otherwise. The annual ranking of accounting firms is based on the ranking released by the Chinese Institute of Certified Public Accountants (CICPA). Dual listing is a dummy variable that equals to one if a firm is dual listed in A-share market and H- or B-share market, and zero otherwise. All the variables are defined in Table 1. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels respectively.

which are dual listed on the stock exchanges and audited by large accounting firms, are less likely to re-offend. This may arise as dual-listed firms need to consider the concerns of international as well as domestic investors. As repeated offending damages corporate reputation, it can reduce opportunities to raise funds internationally (Zhang and Ye, 2020). This effect is compounded by the involvement of big auditors, who have greater incentives to document potential fraudulent behaviors and constrain opportunistic and aggressive reporting practices (Wang et al., 2019a).

Models 3–4 of Table 9 pertain to the impact of supervisory measures on corporate recidivism between big and non-big auditor groups. We report there is a significant and negative relationship between supervisory measures and financial recidivism in both sub-samples, consistent with our main results. The coefficient of ‘dual listing’ is significantly negative in the big auditor sub-group, consistent with our previous analysis. Models 5–6 consider the impact of administrative punishments on corporate recidivism between big and non-big auditor groups. Our results remain unchanged, and we find that administrative punishments are the most effective punishments to deter financial recidivism in both big and non-big auditor groups. Alike previous results, dual-listed companies audited by big ten accounting firms are less likely to re-offend.

4.4.5. Addressing endogeneity and different self-regulatory measures

We address the endogeneity issue using a propensity-score matching (PSM) method. PSM is an approach to address sample selection bias and endogeneity concerns by matching treatment firms with control firms that are as similar as possible. First, the ‘self-regulatory measures’ variable might be endogenous as there are observable differences between firms subject and not subject to self-regulatory measures. We estimate a probit model using self-regulatory measures as the dependent variable and corporate governance related control variables as regressors to derive a firm’s propensity score. The treatment firms are the firms subject to self-regulatory

measures. Corporate governance variables are used as regressors as better corporate governance implies greater oversight and vigilance, leading to less severe sanctions being imposed on fraudulent firms by the regulators (Wang et al., 2019a). To construct the control group, we identify observations that are similar to the treatment group based on the computed propensity scores. Following Yu and Ashton (2015), observations are matched based on the computed propensity scores using the nearest neighbor matching method (1 to 3 matching). We use this matching principle as it is more precise than one to one matching, while only slightly increasing bias (Rassen et al., 2012). We allow matching with replacement to improve the quality of matches and reduce bias.

Subsequently, 595 observations with a matched propensity of firms' governance characteristics are obtained. The difference between treated and control groups is 0.16 and statistically significant at the 1% level in the unmatched sample. After matching, the difference reduces to 0.12 and remains statistically significant. The balancing is good for all covariates as the *t*-tests are not significant in the matched sample. Using these observations, the probit model is re-estimated, with results reported in Model 1 (Table 10). The findings indicate the adoption of self-regulatory measures increasing the likelihood of recidivism.

Similarly, supervisory measures and administrative punishment variables maybe endogenous. To address these concerns, subsamples were constructed using the PSM method. We estimate the average treatment effect through nearest-neighbor matching (1 to 3 matching). Good balancing is evidenced by insignificant control variables after matching, indicating that treated and untreated groups have similar corporate governance characteristics. The model is then re-estimated using propensity score-matched observations. Results are reported in Models 2–3 (Table 10) and are consistent with prior evidence: supervisory measures and administrative measures both reduce corporate recidivism. In addition, the magnitude of coefficient for 'administrative punishment' is greater than that of the 'supervisory measure', indicating that administrative punishments are stronger sanctions. We also altered the number of matches in nearest neighbor matching to any number between 1 and 4. This procedure had little impact on the results suggesting endogeneity is not a concern.

To ensure the robustness of the PSM results, we also adopt a radius matching method to estimate the effect of different regulatory

Table 10
Robustness tests: addressing endogeneity and different self-regulatory measures.

Panel A: Propensity score matching (Nearest neighbor matching: 1 to 3 matching)			
Variables	Model 1	Model 2	Model 3
Self	0.413*** (0.122)		
Supervisory		−0.472*** (0.062)	
Administrative			−4.648*** (0.237)
Control variables	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
Pseudo R ²	0.073	0.067	0.058
Observations	595	942	713
Panel B: Propensity score matching (Radius matching)			
Variables	Model 4	Model 5	Model 6
Self	0.290*** (0.086)		
Supervisory		−0.500*** (0.069)	
Administrative			−4.654*** (0.358)
Control variables	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes
Pseudo R ²	0.069	0.058	0.077
Observations	294	808	406
Panel C: Comparison between public criticism and public condemnation			
Variables	Model 7	Model 8	
Criticism	0.062 (0.157)		
Condemnation		0.654*** (0.146)	
Control variables	Yes	Yes	
Industry effect	Yes	Yes	
Pseudo R ²	0.047	0.063	
Observations	946	946	

Table 10 (Panel A) addresses the endogeneity issue using the propensity score matching (through the nearest neighbor matching method with 1 to 3 matching principle). Panel B addresses the endogeneity issue using the propensity score matching (through the radius matching method with a maximum propensity score distance of 0.05). Panel C compares the impact of different self-regulatory measures (i.e., public criticism and public condemnation) on corporate recidivism. All the variables are defined in Table 1. ***, ** and *, denote statistical significance at the 1%, 5% and 10% levels respectively. The standard errors are adjusted for firm-level clustering.

measures on corporate recidivism. For radius matching, we use all the relevant control observations as matches for a treatment observation that lies within a tolerance level. Following Kang et al. (2023), a tolerance level (i.e., a maximum propensity score distance) of 0.05 is selected.⁷ The results are presented in the Models 4–6 of Panel B (Table 10). The results validate our previous proposition that self-regulatory measures increase the propensity of recidivism, while supervisory and administrative measures reduce recidivism.

Lastly, we examine the impact of major self-disciplinary measures including public criticism and public condemnation on recidivism separately. The results are presented in Models 7–8 of Panel C (Table 10). A positive and significant relationship between public condemnation and recidivism is reported, indicating that public condemnation increases the likelihood of firms engaging in recidivism. However, we report public criticism has no impact on recidivism.⁸

5. Conclusions

While the Chinese economy and its financial markets have experienced unprecedented growth in recent years, the quality of financial reporting remains a concern to regulators and investors (Hass et al., 2016). The incidence of fraudulent financial reporting overshadows the growth and viability of Chinese listed companies. This study examines how recidivist fraudulent financial reporting and punishments are associated. This is undertaken to better understand how we can better calibrate our regulatory tools and limit firms from repeatedly undertaking financial statement fraud.

The key findings are summarized as follows. We identify widespread reoffending by Chinese firms undertaking financial statement fraud. Administrative punishments are the most effective punishments to deter future financial statement fraud. Supervisory measures also have a significant influence on reducing reoffending. Self-regulatory measures such as public condemnation appear to increase the likelihood of corporate recidivism. We also observe that the cost of capital required by equity shareholders is a channel through which different punishments affect recidivism differently. Our results are robust to different model specifications. We suggest that self-regulatory punishments for fraud need to be reassessed.

Our paper has important implications for fraud literature. Prior studies on corporate fraud pay extensive attention to single fraudulent behaviors (Rezaee, 2005; Wu et al., 2016). Our paper extends these studies by addressing corporate recidivism. Compared to an isolated incidence of misconduct, corporate recidivism is more culpable and has a greater negative impact on society, firm reputation, market confidence, and the image of accounting professionals (Zheng and Chun, 2017). There is extremely limited research on corporate recidivism, especially on how to reduce its occurrence. Our study contributes to this literature through the design of efficient penalty structures for repeated offenders. Moreover, this is the first research that addresses the deterrence effect of different punishments in a China's context. Such findings can assist researchers and regulators in assessing the effectiveness of punishments and discovering more efficient behavioral regulatory mechanisms to reduce reoffending.

The findings have implications for accounting professionals, managers, firms, and policymakers. For policy makers we observe administrative and supervisory measures are the effective methods to limit financial statement fraud reoffending. Subsequently, supervision for recalcitrant firms is recommended and with a developed role for CSRC and its regional offices. Similarly, the negative effects of self-regulatory measures in preventing corporate recidivism, suggest this regulatory approach requires revision. For instance, the regulatory role of the stock exchanges could be beneficially constrained or altered. Theoretically, we propose that methods based on the financial costs of offending can be successful supplanted by more behavioral regulatory approaches focused on supervision and the importance of recognizing social norms in the incidence of financial offending.

For accounting professionals, we recommend strengthening audit procedures of sufficiency and authenticity of listed firms' information disclosure. External auditors should improve audit procedures on the authenticity of a firm's revenue, cost and asset impairment items in the income statements and asset items in balance sheets. They also require cognizance of the different fraud techniques used by first-time and recidivist fraudsters. First-time offenders commonly report fictitious information and conceal material information. Recidivists prefer more complex and hidden techniques including the manipulation of revenue, cost and asset items. As most fraudulent firms simultaneously commit several offences, auditors should not consider a detected method of fraud as an isolated event. It should be treated as a signal that there might be other types of fraud techniques used by the firms.

Lastly, the high levels of financial statement fraud observed raises serious concerns as to the effectiveness of corporate governance mechanisms in Chinese listed firms. Traditional internal control mechanisms may be ineffective as management can override these controls (Zhu and Gao, 2011). Therefore, enhanced levels of monitoring and corporate governance arrangements may also be required to alleviate financial statement fraud reoffending.

The limitations of this study offer several avenues for future research. Due to the nature of the data, it is not possible to undertake any proportionality test of the administrative fines imposed on the fraudulent firms for their specific wrongdoing. The way the data is reported by the regulators does not indicate the fines that are imposed for a particular type of fraud. Rather, the administrative fines are imposed as aggregates for a series of fraudulent behaviors committed by the firms. Karpoff et al. (2007) find legal penalties are associated with the harm from the misconduct in U.S.A. However, the size of harm is measured by provable loss, public floatation, and violation period, stock price run-up rather than specific fraudulent behaviors. It would be interesting if future research can run a proportionality test to tease out how administrative fines work in China or other economies.

⁷ We have also used different calipers, including 0.1 and 0.01, and the PSM results remain similar.

⁸ Different from public criticism and public condemnation that are mutually exclusive, different supervisory measures can be used either separately or in combination to address a fraud case. Thus, the impact of individual supervisory measure on fraud is not examined in this paper.

Author statement

Each named author has substantially contributed to conducting the underlying research and drafting and revising this manuscript.

Dr. Yang Wang: Conceptualization, Investigation, Methodology, Formal analysis, Writing - original draft, Writing - review & editing.

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Declaration of Competing Interest

To the best of our knowledge, the named authors declare no conflicts of interest.

Data availability

The regulatory sanction reports are downloaded from the CSRC, 'CNINFO' websites, and the Shanghai and Shenzhen Stock Exchange official websites and they are publicly available.

Other data that support the findings of this study is available from the China Stock Market and Accounting Research (CSMAR) Database. Data are available at <http://www.gtarsc.com/> with the permission of CSMAR.

Appendix 1

Major types of punishments imposed on listed firms.

Punishments	Mainly used by	Regulation basis	Nature of punishments	Severity level across groups	Severity level within group	Characteristics
Fines	CSRC central offices, Ministry of Finance	Laws	Administrative sanctions	Severe	Severe	Monetary fines Warnings are to 'mentally alert' perpetrators To rectify inappropriate behaviors Regulators warn firms over concerns Firms required to make public statements regarding their irregularities Firms' representatives discuss problems with regulators Regulators issue letters and publicly raise concerns Regulators publicly denounce firms Regulators publicly criticize firms
Warning					Less severe	
Rectification notice						
Letter of warning						
Public statements	CSRC regional offices	Departmental provisions	Supervisory measures	Moderate	Severe	
Regulatory interview						
Regulatory concern					Less severe	
Public condemnation	Stock exchanges	Self-regulations	Self-regulatory measures	Minor	Severe	
Public criticism					Less severe	

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