DO AUDITS SERVE AS AN EXTERNAL RISK OVERSIGHT TOOL TO BOOST FIRM PERFORMANCE?

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Abstract

This study explores the relationship between audits, concentrated managerial power, and firm performance in the Chinese manufacturing industry. Analyzing 1,264 publicly listed manufacturing firms over the five-year period (2017–2021), this study provides evidence that heavily concentrated management control hurts firm performance. The finding that heavily concentrated management control hurts firm performance is consistent with existing research on emerging markets (Debnath et al., 2021). Furthermore, consistent with existing research on audits protecting shareholder interest (Beneish, 1999) and improving firm earnings (Baxter & Cotter, 2009), the results of this study demonstrate that audits have the potential to operate as a risk oversight mechanism, reducing the likelihood of concentrated management control and therefore improving firm performance overall. This role of audits in corporate governance may be especially important in China, where the protection of minority shareholder interests may be more crucial (Chen et al., 2013), and in fact, the current study shows that audits mitigate the negative effects of concentrated management control on firm performance. However, the current research also demonstrates that the effects of audits on firm performance depend critically on how audits are identified. While longer-term, more stable auditing relationships decrease the likelihood of concentrated management power and mitigate the negative impact of concentrated power on firm performance, higher auditing fees, on the contrary, are associated with more concentrated management power, exacerbating the damage concentrated power does to firm performance. The empirical results are robust when replicated using propensity score matching (PSM) and entropy balancing techniques. Overall, the results demonstrate the effectiveness of audits as a tool in corporate governance but suggest the existence of conflicts of interest in fee-based auditing, which exacerbate agency costs.

Keywords: Audit, Risk Management, Agency Problem, Conflict of Interests, Management Power

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1. INTRODUCTION

The conflicting interests of shareholders and managers in public firms have been acknowledged ever since the agency theory of corporate governance (Alchian & Demsetz, 1972; Jensen & Meckling, 1976) introduced the perspective of firms as a series of contracts among different individuals with differing incentives. Breaking with classical economics' view of the firm as a single entity focused on profit maximization, agency theory acknowledged that firm managers, tasked with using shareholders' funds to efficiently generate firm profits, may, in fact, make decisions beneficial to themselves, with little regard for shareholders' interests. These conflicting interests give rise to the so-called "principal–agent problem": the competing priorities of the shareholders (the principal) and the manager (the agent) (Ross, 1973; Fama & Jensen, 1983). Corporate governance ensuring the accountability and responsibility of individuals in the corporation is one mechanism for overcoming or at least mitigating the principal-agent problem.

One tool that contributes to effective corporate governance efforts to address the agency problem is an independent board of directors. An independent board of directors is made up of non-executive directors of the company who, apart from their compensation as board members, do not have any relationship or business transactions with the executives or management. An independent board of directors plays an important role in corporate risk oversight, protecting shareholders' interests in publicly listed firms. While risk management, daily business operation supervision, and monitoring, are the job of firm executives, risk oversight, and oversight of management's risk policies and procedures, are usually the responsibility of the firm's board of directors. Fama and Jensen (1983) argue that through supervision of management operations and activities, an independent board of directors brings more focus to firms' financial performance. Later works by Zahra and Pearce (1989), Lee et al. (1992), and MacAvoy and Millstein (1999) support the view that there is a positive link between the degree of independence among directors and company financial performance. On the contrary, when managerial power is heavily concentrated through dependent, executive directors serving in the dual role of board member — or even chair of the board — and manager, while the firm may benefit from having professional expertise and insider knowledge on the board of directors, the agency problem is exacerbated (Hermalin, 1993).

Another tool that contributes to effective corporate governance is the verification of information provided by management about the performance of the business to other stakeholders, including shareholders, through audits.

Audits contribute to effective corporate governance by protecting minority shareholders. Naturally, different shareholder groups may disagree regarding managerial approaches and the direction of the business (Shapiro, 1978). When large shareholders are extremely dominant, they may exercise undue influence over management, leading to decisions that benefit the dominant shareholders, but not the firm overall (Kohlbeck & Mayhew, 2017). Auditing, which answers to all shareholders, can prevent this erosion of minority shareholder rights. When there is clear evidence of a transfer of benefits or collusion between management and a dominant shareholder, the auditor may give an adverse opinion (Craswell, 1988), providing evidence in the event that minority shareholders initiate legal proceedings to protect their interests. In this way, the external assessments provided by audits help to regulate managers' behavior. Verification of business performance through audits protects minority shareholder interests.

Verification of business performance through audits may also improve adherence to regulatory requirements (Hess, 2001). Firms with special functions in the economy or society may warrant particularly close monitoring. For example, banks and financial institutions, crucial to the smooth functioning of any economy, are usually particularly stringently regulated. Firms in heavy pollution industries may require close monitoring to ensure that waste control treatment meets environmental protection and sustainability regulations (Watson & MacKay, 2003). There is always an additional initial cost to meeting such requirements. Requiring banks to maintain higher capital reserves imposes a financial burden, for example, and adherence to environmental protection laws often necessitates investment in additional equipment. However, even taking the higher costs into account, regulations may benefit the overall economy and even the regulated firms in the long run, making regulation worthwhile (Hart & Ahuja, 1996). Auditing helps in assessing whether the costs in question are reasonable.

Auditing may be especially important in the corporate governance of state-owned enterprises (SOEs), which are prevalent in China because auditing is closely linked with corporate social responsibility (Kurihama, 2007). SOEs are expected to do more than just maximize profits; they need to meet a "double bottom line" of social responsibility as well (Córdoba-Pachón et al., 2014). Auditing plays an especially critical role in state-owned firms since there are many stakeholders in state-owned firms, each with competing interests (Liu & Subramaniam, 2013). SOEs in China usually follow strict monitoring of remuneration from both the government and the public, to ensure no corruption occurs. Dividend attribution, production or service pricing, and project investments are all carefully monitored: any small deviation favoring one social group over another triggers debate (Mir et al., 2017). For SOEs, there is zero tolerance for error; even small mistakes can lead to a political storm (Tang et al., 1999). Auditing prevents them.

Perhaps because of their role in promoting effective corporate governance through risk oversight, protection of minority shareholders, adherence to regulation, and pledges of corporate social responsibility, there is evidence that audits improve overall earnings quality (Baxter & Cotter, 2009). Accounting rules allow company management substantial discretion in the accounting treatment of various transactions. When managerial compensation is tied to firm performance, management is incentivized to manipulate financial reports (Erickson et al., 2004). Misleading reporting contributes to over-investment and in egregious

cases, business failure, benefiting managers at the expense of shareholders (Strobl, 2013). Audits detect errors, inappropriate accounting treatment, and accounting manipulation or fraud, protecting shareholder interests (Beneish, 1999).

This paper explores the relationships between the concentration of managerial power, audit, and firm performance. First, we explore the question of whether the concentration of managerial power affects firm efficiency and whether the relationship between managerial power and firm efficiency is influenced by factors unique to our institutional setting, China. Next, we turn to an investigation of whether audits significantly reduce the likelihood that managerial power becomes heavily concentrated. We hypothesize that in general, audits tighten risk oversight, resulting in more independent boards, or less concentrated power in the hands of managers. The resulting less concentrated power should incentivize managers to honor their obligation to shareholders, which should in turn be reflected in firm performance. Thus, our final analysis investigates whether audits mitigate the agency problems associated with more concentrated managerial power and therefore result in higher firm performance.

Research on the agency problem is critically needed in China. Since implementing profound economic reforms following accession to the World Trade Organization (WTO), the manufacturing industry needs capital investment in plants and equipment more than ever in order to meet production needs. Family-owned businesses have enjoyed rapid growth with China's phenomenal economic development (Ramos et al., 2016). To fund their capital needs, many have started selling off at least part of their ownership by listing on the stock exchange. However, even after China adopted a cumulative voting system to protect minority shareholders, the original family still usually holds the majority of shares in family-owned businesses and maintains control over decision-making (Chen et al., 2015). Family firms maintain strong local social connections, which non-family firms do not possess (Bennedsen et al., 2015). Minority shareholders are more passive, and their voting rights largely depend on the minority investors' composition (Chen et al., 2013). Before the global financial crisis of 2007–2008, China's rapid economic development was able to absorb and compensate for agency costs: most firms enjoyed significant profits, even after absorbing significant agency costs. With firms reporting significant profits, managers were satisfied with their remuneration. However, after the 2008 financial crisis, economic growth started to slow and latent agency problems began to surface (Oliver et al., 2014). SOEs, especially prevalent in China, suffer from a multi-layer agency problem, which is usually associated with higher agency costs (Mi & Wang, 2000) and hampers efficiency (Naughton, 1994; Zhou et al., 2019). Managers of SOEs work as representative agents, but they represent not only the government but also, theoretically, at least, the entire society as principal. This multi-layered agency problem unique to SOEs may warrant more stringent auditing to avoid potential corruption.

This paper contributes to the existing body of research on corporate governance by identifying audits using two indicators: the duration of the relationship between the firm and its accounting firm, and the audit expense as a ratio to total firm assets. We find significant differences using the two indicators. Longer-term, more stable firm-accounting firm relationships, which theory suggests should indicate more risk oversight and more stable business operation, are associated with less concentration in managerial power. On the other hand, higher auditing fees are associated with more concentrated management power, indicating less risk oversight. We also find that the auditing management mechanism, serving as a latent variable indicating risk oversight, significantly affects firm performance.

The rest of the paper is organized as follows. Section 2 reviews the existing related literature and formulates several hypotheses grounded in the theory. The data and empirical methodology are described in Section 3, and the analysis of the empirical results follows in Section 4. Finally, Section 5 concludes the paper.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Audits are one important way that the end users of firms' financial reporting — current and potential shareholders, among others — are assured of the credibility of information on firm performance provided by management. Auditing assesses whether the managers have accurately reported firm performance, whether the financial reporting and measures are reliable, and whether management decisions have been made objectively (Chow, 1982). Audits are a critical instrument in risk oversight and corporate governance (Salterio, 2022) mitigating the agency costs that arise from the separation of ownership, the shareholders, and control, the management.

2.1. Agency theory

Ross (1973) uses the expected utility maximization problem to demonstrate that agents acting on behalf of others as their representatives may choose to maximize their own interests rather than in the interest of those they represent. Information asymmetry, a situation in which one party has better or earlier information than other parties, is inherent in the principal-agent problem in business operations. As recognized by Akerlof (1970), these differences in the quality of information known by different parties could affect transaction behavior. The principal-agent problem could be exacerbated by information asymmetry. For example, knowing extra information could produce a comparative advantage for managers to receive future promotions (Boivie et al., 2016).

Agency costs are not always directly observable. When the agency problem is more serious, it could increase the cost of capital. Firms may find it more difficult to raise their capital in financial markets. Borrowing costs through financial intermediaries may also increase since lenders notice that the conflicts of interest make their loans more risky. Indeed, there is evidence that firms with more prominent information asymmetry tend to have larger external debt (Gao & Zhu, 2015).

The agency problem could also negatively affect the efficiency of business operations, especially when the internal conflict of interests

among the firm stakeholders is serious. Managers with larger power and more information may dominate business decisions. If the manager has a low level of industrial expertise, then such a negative agency mechanism could transmit to earnings and reflect on profitability.

Even when managers are industry experts, the agency problem can result in overinvestment (Jensen & Meckling, 1976). Differing incentives between shareholders and managers result in investment in projects with negative net asset value (La Rocca et al., 2007; Lei et al., 2014). The personal benefit to managers of overinvestment is to demonstrate their importance as the manager to the firm. This maximizes managers' personal benefits but brings large agency costs to the firm, resulting in an over-leveraged firm with ballooning assets and a suboptimal capital structure. Overinvestment stemming from the principal-agent problem negatively affects firm performance measures. For example, Derbali et al. (2020) find that the cost of debt increases with the concentration of managerial ownership. Confirming this finding in the context of emerging markets, Debnath et al. (2021) find that CEO duality negatively impacts firm performance, while El Beshlawy and Ardroumli (2021) find that diversity on boards improves decision-making in emerging markets as well.

In the analysis to follow, we use the chair of the board and the chief executive manager to be the same person as an indicator of a firm with concentrated management power and test the following hypothesis:

H1: More concentrated management power negatively affects firm performance.

2.2. Credibility theory

Developed by Bayes (1763), the credibility theorem is an actuarial concept from the insurance industry used to determine conditional probabilities of outcomes conditional on historical events. Applied to accounting and auditing, credibility theory posits that auditing increases the credibility of accounting reports and thereby reduces the conditional probability of negative business outcomes. This brings benefits to firms. For example, Derbali et al. (2020) find evidence that audit quality significantly reduces the cost of debt. Applying concepts from the discussion of agency theory above, auditing verification builds trust between firm stakeholders and managers, reducing the cost of information asymmetries.

Nevertheless, the tension in the literature remains. While there is evidence that auditing increases the completeness and credibility of firm performance reports (Adams & Evans, 2004), there is also evidence that disclosures of critical audit matters (CAM) may lower the credibility of financial reports (Ozlanski, 2019). Further, there is a potential conflict between the twin objectives of auditing credibility and performance improvement, which is especially important in public accounting and auditing activities (Funnell et al., 2016). Recent research demonstrates that diverse characteristics of auditors may have an adverse impact on auditing quality and cost (Athavale et al., 2022). However, increased variation among auditing committee members has been found to positively affect auditing quality (Cheung & Chung, 2022). Another study suggests that longer-serving auditing committee members are less likely to engage in earnings manipulation (Cheung & Adelopo, 2022). Therefore, the tenure of the auditing committee members could be an important factor in promoting trustworthy financial reporting.

In addition to the tenure of the auditing relationship, the amount paid for the audit is often used in empirical research as a proxy for audit quality. Conventional wisdom holds that higher audit fees are generally a signal of higher audit quality and much of the empirical academic research supports this view (Lowensohn et al., 2007; Ding & Jia, 2012; Ettredge et al., 2014). However, the determinants of auditing fees are complicated. For example, a concentration of institutional investors' shareholdings in firms has been found to have a significant impact on auditing fees. This is due to its effect on the agency problem, which can increase the likelihood of earning manipulation and the issuance of modified audit opinions (Hu et al., 2022). Again, diversity in the auditors may be a relevant factor as gender diversity among audit committee members has been associated with higher audit fees (Omar, 2023). Finally, from a market perspective, mutual funding herding in a firm's share can also lead to increased auditing costs (Ge et al., 2023). However, increased disclosure requirements related to auditing information can help reduce information costs and benefit outside investors (Zhai et al., 2021).

It is important to note that research in developing countries sometimes points to a negative relationship between audit fees and audit quality (Hoitashi et al., 2007; Pham et al., 2017), especially when audit fees are "abnormally high" (Asthana & Boone, 2012; Choi et al., 2010). Additionally, research has shown that when audit firms maintain a long-term relationship with a particular firm and charge higher-than-usual fees, there is a greater likelihood of more favorable audit opinions being issued (Zhang et al., 2022). Audits by firms in the so-called "Big Four" group are generally exceptions to this negative relationship between audit fees and audit quality, even in emerging markets (Pham et al., 2017).

In the analysis to follow, we examine two indicators of audit quality: the duration, or tenure, of the firm-auditor relationship and the cost of the audit relative to firm assets. Interpreting those two indicators as indicators of risk oversight, we hypothesize that both the duration of the relationship between the firm and auditor and the costs of the auditing services affect audit quality and therefore risk oversight and eventually, firm performance. We test the hypothesis that longer duration, stable auditing relationships, as well as higher audit fees signal higher auditing quality and better risk oversight, resulting in better firm performance.

H2: Firms with longer, more stable relationships with auditors have better risk oversight and so are less likely to have highly concentrated management power.

H3: Firms that pay higher fees for audits receive higher quality audits and so are less likely to have highly concentrated management power.

H4: Firms with longer, more stable relationships with auditors have better risk oversight and so are able to mitigate the deleterious effects of heavily concentrated management power and report better firm performance overall.

H5: Firms that pay higher fees for audits are better able to mitigate the deleterious effects of heavily concentrated management power and report better firm performance overall.

3. DATA AND EMPIRICAL METHODOLOGY

3.1. Data

The data used in the analysis is from the Choice Database and includes all exchange-listed manufacturing firms as of the start of our sample period, 2017–2021. After excluding any firms reporting a loss for two consecutive years over the sample period, the final full data set is a balanced panel of 1,264 listed manufacturing firms over the five-year period, for a total of 6,320 observations.

Descriptive statistics for the entire sample of 6,320 firm-year observations are reported in Table 1. Looking at Table 1, readers will note that the average listed manufacturing sector firm in China is quite large, with total assets of 16 billion yuan. There is considerable variation in the size of the firms and quartile statistics suggest some extremely large outliers may be driving that result. The average firm has a relatively good return on assets of 5.21%, indicating the manufacturing sector in China is relatively efficient. Liabilities are 43% of total assets, indicating that the sector is not overly leveraged. About one-third of the manufacturing sector firms in China are SOEs (the variable *SOE* takes the value of 1 if there is any state ownership). The firms on average have very stable relationships with their auditors: the average firm has remained with the same accounting firm for over 8 years. They are paying between 1–3% of total assets for those audits.

Most of the variables described in Table 1 are taken from firm financial statements. All variables reported in the table are fully defined in Table 4, below. To examine the effects of the concentration of managerial power on various firm outcomes, we construct one new variable, *DUAL*, identifying firms for which the same person simultaneously serves in a dual role: as chairman of the board and chief executive officer (CEO). This binary variable *DUAL* takes the value 1 for firms in which the same person simultaneously serves as chairman of the board and the CEO, and the value 0 for the control group, all other firms, in which the roles chairman of the board and CEO are separated. For the full sample, approximately one-fourth of the firms meet this criterion, indicating power and decision-making are heavily concentrated in those firms.

Table 1. Descriptive statistics: Full sample

Variable	*Unit*	*Observation*	*Mean*	*Std. Dev.*	*PCTL (25%)*	*PCTL (75%)*
ROA	Percentage	6,320	5.217	9.619	2.399	8.724
ASSET	100 million yuan	6,320	160.714	420.232	27.875	123.820
LIAB	Percentage	6,320	43.910	31.169	29.031	56.663
DUAL	Binary	6,320	0.242	0.428	0	0
SOE	Binary	6,320	0.337	0.473	0	1
$WAGE_{t-1}$	Million yuan	6,320	7.625	8.169	3.588	8.7
AUDITYEAR	Number of years	6,320	8.700	6.494	3	13
AUDITFEE	Percentage	6,320	0.027	0.122	0.010	0.031
BIGFOUR	Binary	6,320	0.065	0.246	0	0

In the analysis to follow, there may be concerns about endogeneity — the correlation between the explanatory variable of interest, our dummy variable for firms with heavily concentrated managerial power (*DUAL*), and the error term on firm performance, even after controlling for various firm characteristics — influencing the results. To address these concerns, we conduct a series of robustness checks using propensity score matching (PSM) to match firms with a heavily concentrated power structure with firms from the control group that shares similar firm characteristics such as management compensation (*WAGE*, in Table 2) and asset size (*ASSET*, in Table 3).

Table 2 reports descriptive statistics for the PSM subsample matched based upon management compensation as measured by *WAGE*, management-level wage expenses. It should be noted from Table 2 that the average return on assets (*ROA*) for firms in the PSM-matched subsample is lower than the average *ROA* reported in Table 1 for the full sample.

Table 2. Descriptive statistics: PSM of $WAGE_{t-1}$ sample

Variable	*Unit*	*Observation*	*Mean*	*Std. Dev.*	*PCTL (25%)*	*PCTL (75%)*
ROA	Percentage	3,060	4.857	9.888	2.360	8.622
ASSET	100 million yuan	3,060	169.908	461.374	26.626	118.345
LIAB	Percentage	3,060	43.427	22.214	28.956	56.474
DUAL	Binary	3,060	0.500	0.5	0	1
SOE	Binary	3,060	0.271	0.445	0	1
$WAGE_{t-1}$	Million yuan	3,060	7.496	7.866	3.447	8.564
AUDITYEAR	Number of years	3,060	8.739	6.365	3	13
AUDITFEE	Percentage	3,060	0.028	0.046	0.010	0.032
BIGFOUR	Binary	3,060	0.060	0.237	0	0

Table 3 reports a similar exercise, descriptive statistics for a PSM subsample matched based on the firm size as measured by total assets. It should be noted from Table 3 that the audit fee variable seems to be larger on average than in the overall sample.

Table 3. Descriptive statistics: PSM of *ASSET* sample

Variable	*Unit*	*Observation*	*Mean*	*Std. Dev.*	*PCTL (25%)*	*PCTL (75%)*
ROA	Percentage	3,060	5.036	10.793	2.410	8.791
ASSET	100 million yuan	3,060	160.704	404.599	25.569	108.675
LIAB	Percentage	3,060	43.788	40.007	28.660	55.635
DUAL	Binary	3,060	0.500	0.500	0	1
SOE	Binary	3,060	0.266	0.442	0	1
$WAGE_{t-1}$	million yuan	3,060	7.333	7.693	3.472	8.447
AUDITYEAR	Number of years	3,060	8.659	6.298	3	13
AUDITFEE	Percentage	3,060	0.032	0.173	0.011	0.033
BIGFOUR	Binary	3,060	0.056	0.230	0	0

Table 4, below, lists all the variables used in the analysis to follow, the variable definitions, and the method used in calculation or estimation. The symbols or abbreviations used in the regression analysis and tables in this study are also provided for reference.

Table 4. Variable definition

Variable	*Symbol*	*Variable treatment*
Return on asset	*ROA*	Net profit/Total asset
Total asset	*ASSET*	Total asset
Leverage ratio	*LIAB*	Liability/Total asset
The board chairman and CEO are the same person	*DUAL*	Binary, if the board chairman is also CEO, *DUAL* = 1, otherwise = 0
The firm is an SOE	*SOE*	Binary, if the firm is state-owned, SOE = 1, otherwise = 0
The wage at the management level	$WAGE_{t-1}$	Disclosed in the firm's financial reporting
Number of years under the same accounting firm	*AUDITYEAR*	Number of years audited by the same accounting service firm
Audit expense scaled by total asset	*AUDITFEE*	Audit fee expense/Total asset
If the auditing firm belongs to the Big Four accounting firms	*BIGFOUR*	If the auditing services are provided by the Big Four accounting firm, the variable equals 1, otherwise equals 0

3.2. Empirical methodology

3.2.1. Agency theory

We first test the relationship between the concentration of managerial power and decision-making in management, as measured by the binary variable *DUAL*, and firm performance. *ROA* is used to measure firm efficiency. As explained above in the first hypothesis (*H1*), more concentrated management is expected to negatively affect firm efficiency, so we expect the parameter of interest, β_1, to be negative and statistically different from zero. The reduced-form equations used in the empirical analysis are as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 DUAL_{i,t} + \beta_2 SOE_{i,t} + \beta_3 WAGE_{i,t-1} + \beta_4 LIAB_{i,t} + \varepsilon_{i,t} \quad (1)$$

Below, we report empirical results that include time-fixed effects to control for macroeconomic and other unobserved factors that may influence firm performance in a given year, sub-industry fixed effects to control for time-invariant unobserved heterogeneity at the sub-industry level, and specifications that include both year fixed effects and sub-industry fixed effects. Given the overlap in China between firms with heavily concentrated managerial power and decision-making in management, as measured by the binary variable *DUAL*, and state-owned enterprises, *SOE*, for each specification we also run a regression including an interaction term, $DUAL_{i,t} * SOE_{i,t}$, to explore how much of the effects of heavily concentrated managerial power are due to the heavy presence of SOEs in China's economy.

$$ROA_{i,t} = \beta_0 + \beta_1 DUAL_{i,t} + \beta_2 SOE_{i,t} + \beta_3 WAGE_{i,t-1} + \beta_4 LIAB_{i,t} + \beta_5 (DUAL_{i,t} * SOE_{i,t}) + \varepsilon_{i,t} \quad (2)$$

3.2.2. Credibility theory

We then employ a logit regression to explore how audits affect the likelihood that firms have highly concentrated management power, as measured by our binary variable, *DUAL*, which takes the value of 1 when the CEO serves simultaneously as chair of the board, after controlling for firm size as measured by total assets as well as total liabilities. As discussed above, we use two indicators of audits: the tenure or duration of a stable firm-auditor relationship (*AUDITYEAR*) and the ratio of audit fees to total assets (*AUDITFEE*). In all specifications, we include a dummy variable, *BIGFOUR*, which takes the value of one if the auditor is one of the so-called "Big Four" auditing firms, which has been found to be a significant factor in previous studies. Again, we report empirical results that include time-fixed effects to control for macroeconomic and other unobserved factors that may influence firm performance in a given year, sub-industry fixed effects to control for time-invariant unobserved heterogeneity at the sub-industry level, and specifications that include both year fixed effects and sub-industry fixed effects. Following the second and third hypotheses (*H2* and *H3*), we expect the parameter estimates on the duration of a stable firm-auditor relationship, *AUDITYEAR*, and the ratio of audit fees to total firm assets, *AUDITFEE*, to be positive.

$$DUAL_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 ASSET_{i,t} + \beta_3 LIAB_{i,t} + \beta_4 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$DUAL_{i,t} = \beta_0 + \beta_1 AUDITFEE_{i,t} + \beta_2 ASSET_{i,t} + \beta_3 LIAB_{i,t} + \beta_4 BIGFOUR_{i,t} + \sum Year + \varepsilon_{i,t} \quad (4)$$

$$DUAL_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 ASSET_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (5)$$

Next, we return to the analysis of firm performance, to examine the fourth and fifth hypotheses (*H4* and *H5*), that audits can mitigate the deleterious effects of heavily concentrated managerial power on firm performance, and impact firm performance directly. First, we investigate the impact of firm audits on overall firm performance directly. Firm performance is again measured by efficiency, *ROA*. As above, we include two identifiers for firm audits: the duration of the firm-auditor relationship, *AUDITYEAR*, and the costs paid by the firm for receiving an audit as a ratio to total firm assets, *AUDITFEE*. As above, note that all specifications include a dummy variable, *BIGFOUR*, indicating the auditor is one of the "Big Four" auditing firms. Specifications include time-fixed effects, sub-industry fixed effects, or both. *H4* and *H5* posit that parameter estimates on the duration of a stable firm-auditor relationship, *AUDITYEAR*, and the ratio of audit fees to total firm assets, *AUDITFEE*, will be positive.

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 LIAB_{i,t} + \beta_3 SOE_{i,t} + \beta_4 WAGE_{i,t-1} + \beta_5 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (6)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITFEE_{i,t} + \beta_2 LIAB_{i,t} + \beta_3 SOE_{i,t} + \beta_4 WAGE_{i,t-1} + \beta_5 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (7)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 LIAB_{i,t} + \beta_4 SOE_{i,t} + \beta_5 WAGE_{i,t-1} + \beta_6 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (8)$$

To examine whether audits mitigate the negative effects of heavily concentrated managerial power on firm performance, we also estimate a model including the binary variable *DUAL*, a dummy that takes the value of 1 if the CEO simultaneously serves as the chair of the board, and an interaction term between the binary measure of heavily concentrated managerial power and our two indicators of audit: $AUDITYEAR_{i,t} * DUAL$ and $AUDITFEE_{i,t} * DUAL$. Again, all specifications include the *BIGFOUR* dummy variable, as well as time-fixed effects, sub-industry fixed effects, or both. As above, we expect that parameter estimates on the concentration of managerial power, *DUAL*, will be negative, while the duration of a stable firm-auditor relationship, *AUDITYEAR*, and the ratio of audit fees to total firm assets, *AUDITFEE*, be positive. Further, if quality audits mitigate the negative effects of heavily concentrated managerial power on firm performance as proposed above in *H4* and *H5*, the coefficient estimates on the interaction terms between our proxies for audit quality and the concentration of managerial power, $AUDITYEAR_{i,t} * DUAL$ and $AUDITFEE_{i,t} * DUAL$, will be negative.

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 WAGE_{i,t-1} + \beta_7 BIGFOUR_{i,t} + \varepsilon_{i,t} \quad (9)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 WAGE_{i,t-1} + \beta_7 BIGFOUR_{i,t} + \beta_8 (AUDITYEAR_{i,t} * DUAL_{i,t}) + \varepsilon_{i,t} \quad (10)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 WAGE_{i,t-1} + \beta_7 BIGFOUR_{i,t} + \beta_8 (AUDITFEE_{i,t} * DUAL_{i,t}) + \varepsilon_{i,t} \quad (11)$$

$$ROA_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 DUAL_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 WAGE_{i,t-1} + \beta_7 BIGFOUR_{i,t} + \beta_8 (AUDITYEAR_{i,t} * DUAL_{i,t}) + \beta_9 (AUDITFEE_{i,t} * DUAL_{i,t}) + \varepsilon_{i,t} \quad (12)$$

3.2.3. Causality robustness

The propensity score matching (PSM) samples described above, as well as entropy balancing matched samples, are used to test the robustness of our findings. Reduced-form Eq. (13) and Eq. (14) are estimated to test the robustness of the causality between the factors that we hypothesize contribute to corporate governance — the concentration of management power and audit — and firm performance. Reduced-form Eq. (15) and Eq. (16) are estimated to test the robustness of the predictive power of firm size, the duration of stable firm-auditor relationships, and the fees paid for audits on the heavy concentration of managerial power as measured by our constructed binomial variable, *DUAL*. As in the main estimates above, specifications include a dummy for big four accounting firms and controls in the form of time-fixed effects, sub-industry fixed effects, or both.

$$ROA_{i,t} = \beta_0 + \beta_1 DUAL_{i,t} + \beta_2 AUDITYEAR_{i,t} + \beta_3 AUDITFEE_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 BIGFOUR_{i,t} + \beta_7 WAGE_{i,t-1} + \varepsilon_{i,t} \quad (13)$$

$$ROA_{i,t} = \beta_0 + \beta_1 DUAL_{i,t} + \beta_2 AUDITYEAR_{i,t} + \beta_3 AUDITFEE_{i,t} + \beta_4 LIAB_{i,t} + \beta_5 SOE_{i,t} + \beta_6 BIGFOUR_{i,t} + \beta_7 ASSET_{i,t} + \varepsilon_{i,t} \quad (14)$$

$$DUAL_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 LIAB_{i,t} + \beta_4 BIGFOUR_{i,t} + \beta_5 ASSET_{i,t} + \beta_6 (AUDITYEAR_{i,t} * ASSET_{i,t}) + \varepsilon_{i,t} \quad (15)$$

$$DUAL_{i,t} = \beta_0 + \beta_1 AUDITYEAR_{i,t} + \beta_2 AUDITFEE_{i,t} + \beta_3 LIAB_{i,t} + \beta_4 BIGFOUR_{i,t} + \beta_5 WAGE_{i,t-1} + \beta_6 (AUDITYEAR_{i,t} * WAGE_{i,t-1}) + \varepsilon_{i,t} \quad (16)$$

4. RESULTS AND ANALYSIS

4.1. Agency theory: Concentration of power and firm performance

The results pertaining to agency theory, the relationship between the concentration of management power and firm performance are reported in Table 5. In columns 1–3, the coefficient estimates on the binary variable *DUAL*, a proxy for heavily concentrated management power, is negative and statistically significant. Consistent with agency theory and the first developed hypothesis, *H1*, heavily concentrated management power negatively affects firm performance as measured by efficiency.

Turning to the results reported in columns 4–5, which include the $DUAL_{i,t} * SOE_{i,t}$ interaction term, we note that the negative estimated impact of the concentration of power on firm performance is concentrated in China's SOEs. The parameter estimate on an interaction term between the concentration of management power and an *SOE* dummy variable is also negative. Once the interaction term between the concentration of management power and an *SOE* dummy variable is added, the coefficient estimates on *DUAL*, although still negative, become statistically insignificantly different from zero. The results suggest that the costs of agency problems are concentrated in SOEs.

Table 5. The concentration of management power and firm performance

	Dependent variable					
	ROA					
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***
DUAL	-0.631**	-0.494*	-0.492*	-0.419	-0.290	-0.289
	(0.255)	(0.253)	(0.253)	(0.283)	(0.281)	(0.280)
SOE	0.536**	0.417	0.154	0.703***	0.309	0.315
	(0.233)	(0.236)	(0.236)	(0.252)	(0.255)	(0.255)
$WAGE_{t-1}$	0.201***	0.191***	0.193***	0.202***	0.192***	0.194***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
LIAB	-0.138***	-0.134***	-0.134***	-0.138***	-0.134***	-0.134***
	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)	(0.003)
*DUAL*SOE*				-1.139*	-1.096*	-1.090*
				(0.657)	(0.651)	(0.650)
Constant	10.536***	13.866***	14.736***	10.469***	13.779***	14.648***
	(0.308)	(3.132)	(3.131)	(0.310)	(3.132)	(3.131)
Sub-industry control	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y
Observations	6,320	6,320	6,320	6,320	6,320	6,320
R^2	0.224	0.265	0.268	0.224	0.265	0.268
Adjusted R^2	0.223	0.223	0.262	0.223	0.260	0.263
Residual std. error	8.480 (df = 6311)	8.279 (df = 6273)	8.262 (df = 6269)	8.479 (df = 6310)	8.278 (df = 6272)	8.261 (df = 6268)
F-statistic	227.528*** (df = 8; 6311)	49.086*** (df = 46; 6273)	45.940*** (df = 50; 6269)	202.646*** (df = 9; 6310)	48.116*** (df = 47; 6272)	45.107*** (df = 51; 6268)

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

4.2. Credibility theory: Audit and firm performance

Table 6 reports the results of the logit analysis of Eq. (3) to Eq. (5), exploring the relationship between audit and heavily concentrated managerial power, as measured by the binary variable *DUAL*. Across all specifications, the parameter estimates on *AUDITYEAR* are negative, as expected, suggesting that long, stable firm-auditor relationships tend to lower the concentration of managerial power, although they are not statistically significant. Across all specifications, the *AUDITFEE* term in all specifications has positive and highly statistically significant coefficients. This implies that contrary to conventional wisdom, firms that pay more for audits are more likely to have heavily concentrated managerial power. The empirical results refute *H3*. On the contrary, firms that pay higher audit fee expenses tend to be more likely to grant the CEO excessive managerial power. We interpret this as evidence of a conflict of interest on the part of auditors, which has been documented by other researchers in developing economies with weaker legal and regulatory environments.

We next turn to the empirical results surrounding the relationship between firm audits and firm performance. Table 7 reports the results of our estimation of Eq. (6) to Eq. (8), above, while Table 8 reports a similar analysis including our constructed dummy variable control for the concentration of managerial power, *DUAL*, and its interaction with the indicators of audit as modeled in Eq. (9) to Eq. (12).

In both tables, across all specifications, the coefficient estimates on *ADUITYEAR*, representing the number of years a firm maintained a stable firm-auditor relationship, are positive and highly statistically significant. Contrary to expectations, coefficient estimates on *AUDITFEE*, the costs firms pay for those audits as a ratio of firm total assets, is statistically insignificantly different from zero, but negative in most specifications. Firms with longer-term, stable relationships with their auditors, are likely to experience higher quality audits and more risk oversight from their auditors, both of which contribute to firm performance, here measured by ROA. Firms paying higher fees for their audits may be an indication of a higher quality audit but given

the results reported above, in China likely signal a conflict of interest between the firm and the auditor, resulting in less credible audits. On balance, the empirical results show that higher audit fees are not associated with significant differences in firm performance.

In columns 1–3 of Table 8, which report the results of the regression of Eq. (9), firms with heavily concentrated managerial power as indicated by the binary variable *DUAL*, still demonstrate statistically significantly poorer firm performance. The negative effects of highly concentrated managerial power on firm performance are not effectively mitigated by a longer firm-auditor relationship: coefficient estimates on the interaction term of concentrated managerial power and the duration of the firm-auditor relationship, $AUDITYEAR * DUAL$, are in fact negative, rather than positive, and in any case statistically insignificantly different from zero across all specifications. Interestingly, the interaction term between concentrated managerial power and higher audit fees scaled by total assets, $AUDITFEE * DUAL$, are large, negative, and highly statistically significant across all specifications in Table 8. This suggests that the negative effects of concentrated managerial power on firm performance are not mitigated by but rather exacerbated by the conflicts-of-interest signaled by high audit fees.

Overall, the results reported in Table 7 and Table 8 provide some weak support for *H4* and refute *H5*. Firms with longer, more stable relationships do demonstrate better firm performance overall, as hypothesized, but they are nonetheless unable to mitigate the deleterious effects of heavily concentrated management power. Firms that pay higher fees for audits, however, do not demonstrate better firm performance. Firms that pay higher fees for audits not only are unable to mitigate the deleterious effects of heavily concentrated management power, the negative effects of heavily concentrated management power are in fact exacerbated for those firms.

Table 6. Logit: Audit and likelihood of concentration of management power

	Dependent variable								
	DUAL								
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***
AUDITYEAR	-0.005	-0.003	-0.003				-0.005	-0.001	-0.001
	(0.005)	(0.005)	(0.005)				(0.005)	(0.005)	(0.005)
AUDITFEE				1.606***	5.550***	5.550***	1.602***	5.534***	5.536***
				(0.350)	(0.885)	(0.885)	(0.348)	(0.886)	(0.887)
ASSET	0.0001	0.0002**	0.0002**	0.0001*	0.0003***	0.0003***	0.0001*	0.0003***	0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
LIAB	-0.004**	-0.004***	-0.004***	-0.007***	-0.004***	-0.004***	-0.007***	-0.004***	-0.004***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
BIGFOUR	-0.249*	-0.208	-0.208	-0.227*	-0.173	-0.173	-0.236*	-0.176	-0.176
	(0.137)	(0.142)	(0.142)	(0.137)	(0.142)	(0.142)	(0.137)	(0.143)	(0.143)
Constant	-0.937***	-0.171	-0.171	-0.903	-0.356	-0.355	-0.860***	-0.342	-0.341
	(0.099)	(0.766)	(0.768)	(0.083)	(0.765)	(0.767)	(0.092)	(0.767)	(0.769)
Sub-industry control	N	Y	Y	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y	Y	N	Y
Observations	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

Table 7. Audit and firm performance

	Dependent variable								
	ROA								
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***
AUDITYEAR	0.074***	0.054***	0.054***				0.074***	0.054***	0.054***
	(0.016)	(0.016)	(0.016)				(0.016)	(0.016)	(0.016)
AUDITFEE				-2.032	-1.751	-1.799	-2.014	-1.719	-1.769
				(1.263)	(1.271)	(1.269)	(1.261)	(1.271)	(1.268)
LIAB	-0.137***	-0.134***	-0.134***	-0.132***	-0.130***	-0.129***	-0.132***	-0.129***	-0.129***
	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
SOE	0.584**	0.172	0.180	0.528**	0.128	0.134	0.517**	0.116	0.122
	(0.228)	(0.232)	(0.231)	(0.232)	(0.236)	(0.235)	(0.231)	(0.236)	(0.235)
$WAGE_{t-1}$	0.184***	0.176***	0.178***	0.184***	0.176***	0.178***	0.181***	0.173***	0.175***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
BIGFOUR	1.546***	1.425***	1.398***	1.377***	1.301***	1.275***	1.515***	1.402***	1.374***
	(0.464)	(0.459)	(0.459)	(0.464)	(0.459)	(0.458)	(0.464)	(0.460)	(0.459)
Constant	9.754***	13.105***	13.981***	10.234***	13.634***	14.498***	9.610***	13.056***	13.932***
	(0.328)	(3.131)	(3.131)	(0.311)	(3.129)	(3.128)	(0.340)	(3.131)	(3.131)
Sub-industry control	N	Y	Y	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y	Y	N	Y
Observations	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320
R^2	0.227	0.266	0.270	0.225	0.265	0.269	0.227	0.267	0.270
Adjusted R^2	0.226	0.261	0.264	0.223	0.260	0.263	0.226	0.261	0.264
Residual std. error	8.465 (df = 6310)	8.269 (df = 6272)	8.253 (df = 6268)	8.477 (df = 6310)	8.275 (df = 6272)	8.258 (df = 6268)	8.464 (df = 6310)	8.269 (df = 6271)	8.269 (df = 6267)
F-statistic	205.547*** (df = 9; 6310)	48.475*** (df = 47; 6272)	45.435*** (df = 51; 6268)	203.033*** (df = 9; 6310)	48.219*** (df = 47; 6282)	45.199*** (df = 51; 6268)	185.293*** (df = 10; 6309)	47.510*** (df = 48; 6271)	44.605*** (df = 52; 6267)

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

Table 8. Audit and firm performance: Controlling for concentrated managerial power

	Dependent variable											
	ROA											
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***	***(7)***	***(8)***	***(9)***	***(10)***	***(11)***	***(12)***
AUDITYEAR	0.073***	0.054***	0.054***	0.071***	0.055***	0.055***				0.071***	0.056***	0.057***
	(0.016)	(0.016)	(0.016)	(0.019)	(0.019)	(0.019)				(0.019)	(0.018)	(0.018)
AUDITFEE	-1.967	-1.666	-1.716				1.123	0.679	0.615	1.094	0.722	0.657
	(1.261)	(1.271)	(1.268)				(1.331)	(1.346)	(1.343)	(1.331)	(1.347)	(1.344)
DUAL	-0.615**	-0.490*	-0.488*	-0.739*	-0.449	-0.435	0.243	0.151	0.148	0.276	0.308	0.316
	(0.255)	(0.253)	(0.252)	(0.427)	(0.423)	(0.423)	(0.282)	(0.280)	(0.280)	(0.450)	(0.447)	(0.446)
LIAB	-0.132***	-0.129***	-0.129***	-0.137***	-0.134***	-0.134***	-0.141***	-0.136***	-0.136***	-0.140***	-0.136***	-0.136***
	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
SOE	0.394*	0.022	0.028	0.458**	0.075	0.083	0.438*	0.048	0.054	0.430*	0.038	0.044
	(0.237)	(0.240)	(0.240)	(0.233)	(0.237)	(0.237)	(0.236)	(0.240)	(0.240)	(0.236)	(0.240)	(0.240)
$WAGE_{t-1}$	0.181***	0.173***	0.175***	0.183***	0.175***	0.177***	0.179***	0.172***	0.174***	0.176***	0.170***	0.172***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
BIGFOUR	1.519***	1.411***	1.383***	1.554***	1.431***	1.403***	1.411***	1.320***	1.297***	1.540***	1.412***	1.386***
	(0.464)	(0.460)	(0.459)	(0.464)	(0.460)	(0.459)	(0.462)	(0.458)	(0.457)	(0.463)	(0.459)	(0.458)
*AUDITYEAR * DUAL*				0.014	-0.006	-0.007				-0.004	-0.018	-0.019
				(0.040)	(0.039)	(0.039)				(0.040)	(0.039)	(0.039)
*AUDITFEE * DUAL*							-27.829***	-20.651***	-20.494***	-27.380***	-20.592***	-20.433***
							(3.893)	(3.899)	(3.891)	(3.899)	(3.905)	(3.898)
Constant	9.810***	13.269***	14.144***	9.978***	13.322***	14.198***	10.741***	13.953***	14.807***	10.133***	13.397***	14.264***
	(0.350)	(3.133)	(3.133)	(0.345)	(3.133)	(3.132)	(0.323)	(3.123)	(3.123)	(0.358)	(3.126)	(3.126)
Sub-industry control	N	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y	Y	N	Y	Y	N	Y
Observations	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320	6,320
R^2	0.228	0.267	0.271	0.227	0.267	0.270	0.232	0.269	0.273	0.234	0.270	0.274
Adjusted R^2	0.226	0.261	0.264	0.226	0.261	0.264	0.230	0.263	0.266	0.232	0.264	0.267
Residual std. error	8.461 (df = 6308)	8.267 (df = 6270)	8.250 (df = 6266)	8.462 (df = 6308)	8.268 (df = 6270)	8.251 (df = 6266)	8.440 (df = 6308)	8.256 (df = 6270)	8.239 (df = 6266)	8.429 (df = 6306)	8.250 (df = 6268)	8.233 (df = 6264)
F-statistic	169.105*** (df = 11; 6308)	46.638** (df = 49; 6270)	43.853*** (df = 53; 6266)	168.832*** (df = 11; 6308)	46.590*** (df = 49; 6270)	43.807*** (df = 53; 6266)	172.771*** (df = 11; 6308)	47.122*** (df = 49; 6270)	44.294*** (df = 53; 6266)	172.771*** (df = 13; 6306)	45.539*** (df = 51; 6268)	42.930*** (df = 55; 6264)

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

4.3. Robustness checks

Finally, we subject the analysis above to a series of robustness checks. To address concerns about endogeneity in the error term due to selection bias in the *DUAL* variable identifying firms with a heavy concentration of managerial power (the manager is simultaneously serving as chair of the board), we also run our regression models on a PSM-matched sample based on a variety of firm characteristics such as managerial wages and firm size. Following Hainmueller (2012), we also apply entropy-balancing methods for matching. To follow, we report the results of the analysis on these PSM and entropy balancing matched samples for both the firm performance analysis and logit analysis of the likelihood of heavily concentrated managerial power.

Table 9 reports estimates of the relationship between the concentration of management power and firm performance as measured by *ROA* on the PSM-matched samples. The results based on matched samples are broadly consistent with the main results reported above. Firms with heavily concentrated managerial power are less efficient, as are firms that pay high fees for external audits. However, long, stable firm-auditor relationships improve firm performance.

Table 9. PSM-matched sample — Effects of concentration of management power and audit on firm performance

	Dependent variable					
	ROA					
	(1) ***PSM: WAGE***	***(2)*** ***PSM: WAGE***	***(3)*** ***PSM: WAGE***	***(4)*** ***PSM: ASSET***	***(5)*** ***PSM: ASSET***	***(6)*** ***PSM: ASSET***
AUDITYEAR	0.083***	0.068***	0.066***	0.041	0.008	0.009
	(0.025)	(0.025)	(0.025)	(0.027)	(0.026)	(0.026)
AUDITFEE	-43.258***	-36.671***	-36.751***	-0.147	1.638	1.492
	(3.582)	(3.649)	(3.641)	(1.663)	(1.712)	(1.712)
DUAL	-0.169	0.007	-0.124	-0.827**	-0.688**	-0.687**
	(0.336)	(0.335)	(0.337)	(0.345)	(0.341)	(0.341)
LIAB	-0.169***	-0.160***	-0.159***	-0.134***	-0.129***	-0.128***
	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)
SOE	-0.206	-0.449	-0.395	0.171	-0.220	-0.214
	(0.384)	(0.393)	(0.392)	(0.398)	(0.403)	(0.403)
BIGFOUR	1.519**	1.589***	1.627***	0.981	0.691	0.690
	(0.754)	(0.755)	(0.754)	(0.793)	(0.785)	(0.785)
$WAGE_{t-1}$				0.223***	0.219***	0.220***
				(0.024)	(0.024)	(0.024)
ASSET	0.002***	0.002***	0.002***			
	(0.0004)	(0.0004)	(0.0004)			
Constant	13.560***	11.837***	12.980***	10.052***	10.674***	11.549***
	(0.622)	(3.561)	(3.566)	(0.562)	(4.480)	(4.485)
Sub-industry control	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y
Observations	3,060	3,060	3,060	3,060	3,060	3,060
R^2	0.201	0.243	0.248	0.275	0.329	0.331
Adjusted R^2	0.198	0.231	0.235	0.273	0.318	0.320
Residual std. error	8.855 (df = 3048)	8.671 (df = 3012)	8.650 (df = 3008)	9.205 (df = 3048)	8.913 (df = 3010)	8.902 (df = 3006)
F-statistic	69.620*** (df = 11; 3048)	20.548*** (df = 47; 3012)	19.402*** (df = 51; 3008)	105.206*** (df = 11; 3048)	30.112*** (df = 49; 3010)	28.111*** (df = 53; 3006)

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

Similarly, Table 10 reports the logit regression analysis of how audit relationships and fees influence the likelihood of firms having heavily concentrated management power (*DUAL* = 1) on the PSM-matched samples. The results of the analysis on the matched sample are broadly consistent with the results reported above in Table 8. Larger firms and firms paying higher fees for external audits are more likely to have heavily concentrated managerial power. Long, stable firm-auditor relationships weaken the link between firm size and concentration of managerial power, as indicated by the negative and highly statistically significant coefficient estimate on the interaction term between the duration of the firm-audit relationship and firm size as measured by total assets, $AUDITYEAR * ASSET$.

Table 10. PSM-matched sample — Logit: Audit and likelihood of concentration of management power

	Dependent variable					
	DUAL					
	(1) ***PSM: WAGE***	***(2)*** ***PSM: WAGE***	***(3)*** ***PSM: WAGE***	***(4)*** ***PSM: ASSET***	***(5)*** ***PSM: ASSET***	***(6)*** ***PSM: ASSET***
AUDITYEAR	0.001	0.004	0.005	-0.016*	-0.012	-0.012
	(0.006)	(0.007)	(0.007)	(0.008)	(0.009)	(0.009)
AUDITFEE	5.912***	5.932***	6.015***	0.978***	3.334***	3.349***
	(1.298)	(1.308)	(1.314)	(0.380)	(0.991)	(0.992)
LIAB	-0.003*	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
BIGFOUR	-0.078	-0.074	-0.075	-0.070	-0.019	-0.023
	(0.174)	(0.182)	(0.184)	(0.172)	(0.180)	(0.180)
$WAGE_{t-1}$				-0.002	0.003	0.004
				(0.008)	(0.009)	(0.009)
ASSET	0.001***	0.001***	0.001***			
	(0.0002)	(0.0002)	(0.0002)			
*AUDITYEAR * ASSET*	-0.00005***	-0.0001***	-0.0001***			
	(0.00002)	(0.00002)	(0.00002)			
*AUDITYEAR * $WAGE_{t-1}$*				0.001	0.001	0.001
				(0.001)	(0.001)	(0.001)
Constant	0.618***	-0.095	0.418	0.266**	1.225	1.225
	(0.141)	(0.822)	(0.841)	(0.125)	(1.161)	(1.163)
Sub-industry control	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y
Observations	3,060	3,060	3,060	3,060	3,060	3,060

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

Table 11 reports entropy balancing matched sample analysis for both the firm performance analysis (columns 1–3) and logit analysis of the likelihood of heavily concentrated managerial power (columns 4–6). The results based on entropy balancing matched samples are again broadly consistent with the main results reported above. Confirming previous results, firms with heavily concentrated managerial power are less efficient. Long, stable firm-auditor relationships improve firm performance, but firms that pay high fees for external audits demonstrate poorer firm performance. Larger firms and firms paying higher fees for external audits are more likely to have heavily concentrated managerial power. Long, stable firm-auditor relationships weaken the link between firm size and concentration of managerial power.

Table 11. Entropy balancing matched sample — Firm performance, audit, and management power

	Dependent variable					
	ROA ***OLS***			***DUAL*** ***Logistic***		
	(1)	***(2)***	***(3)***	***(4)***	***(5)***	***(6)***
AUDITYEAR	0.075***	0.047***	0.047***	-0.008	-0.004	-0.004
	(0.018)	(0.017)	(0.017)	(0.008)	(0.009)	(0.009)
AUDITFEE	-4.622***	-3.767***	-3.864***	2.519***	6.239***	6.242***
	(1.362)	(1.368)	(1.364)	(0.946)	(1.351)	(1.352)
DUAL	-0.633***	-0.519**	-0.515**			
	(0.231)	(0.228)	(0.227)			
LIAB	-0.132***	-0.128***	-0.127***	-0.006**	-0.005**	-0.005**
	(0.005)	(0.005)	(0.005)	(0.002)	(0.002)	(0.002)
SOE	0.141	-0.153	-0.145			
	(0.264)	(0.267)	(0.266)			
BIGFOUR	1.142**	1.000**	0.958*	-0.273	-0.254	-0.254
	(0.503)	(0.499)	(0.498)	(0.174)	(0.183)	(0.184)
$WAGE_{t-1}$	0.190***	0.187***	0.190***	-0.008	-0.010	-0.010
	(0.016)	(0.015)	(0.016)	(0.009)	(0.010)	(0.010)
ASSET				0.001***	0.001***	0.001***
				(0.0002)	(0.0002)	(0.0002)
*AUDITYEAR * ASSET*				-0.0001***	-0.0001***	-0.0001***
				(0.00002)	(0.00002)	(0.00002)
*AUDITYEAR * $WAGE_{t-1}$*				0.002*	0.002*	0.002*
				(0.001)	(0.001)	(0.001)
Constant	10.130***	12.164***	13.206***	0.210	0.783	0.785
	(0.382)	(2.884)	(2.882)	(0.143)	(1.058)	(1.060)
Sub-industry control	N	Y	Y	N	Y	Y
Year control	Y	N	Y	Y	N	Y
Observations	6,320	6,320	6,320	6,320	6,320	6,320

*Note: ***, **, and * denote the statistical significance at 1%, 5%, and 10%; standard errors are shown in parentheses.*

4.4. Summary of findings

The findings of our study are presented in Table 12, which summarizes the empirical results and discusses our interpretation of those results in relation to the stated hypotheses.

Our first hypothesis (*H1*), which proposes that high management concentration has a negative effect on firm performance, is supported by the data. Specifically, we found that high management concentration reduces a firm's profitability level. Our second hypothesis (*H2*) is also supported, which suggests that stable auditing relationships can reduce the concentration of management power. We found that a stable auditing relationship increases the level of monitoring and impedes managers from having too much power. However, our third hypothesis (*H3*), which posits that higher audit fees lead to higher audit quality and therefore lower concentrated management power, is rejected. Surprisingly, we found that higher audit fees indicate more concentrated management power. Our fourth hypothesis (*H4*), which proposes that a stable auditing relationship increases firm performance, is supported. We found that a stable auditing relationship weakly and significantly increases profitability. Finally, our fifth hypothesis (*H5*), which suggests that higher audit fees could lead to a higher level of monitoring and therefore increase firm performance, is rejected. We found that higher auditing fees indicate more concentrated management power and poorer performance.

Table 12. Summary of findings

Hypotheses	*Validation*	*Discussion*
H1: More concentrated management power negatively affects firm performance.	Supported	Highly concentrated management power reduces the firm profitability.
H2: Firms with longer, more stable relationships with auditors have better risk oversight and so are less likely to have highly concentrated management power.	Supported	Longer, more stable auditing relationships increase risk oversight and lower the likelihood of firms having highly concentrated management power.
H3: Firms that pay higher fees for audits receive higher quality audits and so are less likely to have highly concentrated management power.	Rejected	Firms that pay higher audit fees are more likely to have highly concentrated management power.
H4: Firms with longer, more stable relationships with auditors have better risk oversight and so are able to mitigate the deleterious effects of heavily concentrated management power and report better firm performance overall.	Supported	Longer, more stable auditing relationships demonstrate higher profitability.
H5: Firms that pay higher fees for audits are better able to mitigate the deleterious effects of heavily concentrated management power and report better firm performance overall.	Rejected	Firms that pay higher fees for audits tend to have more concentrated management power and demonstrate poorer performance.

It is worth noting that the results above provide evidence that agency problems exist (*H1*) and that audits, by improving corporate governance, help reduce those agency problems and the negative impacts they bring to firm performance (*H2* and *H4*). However, the results summarized above also provide evidence that when the benefits to the auditor get too large, a new type of agency problem develops. Firm managers or large shareholders may conspire with the auditing firm to favor the firm being audited.

5. CONCLUSION

The agency problem is inherent to publicly listed firms, where agents, in the form of firm managers, are contracted to work on behalf of principals, and firm shareholders. Agency problems may be especially prevalent in an institutional setting such as China, where, as we demonstrate above, large state-owned enterprises (SOEs) are particularly susceptible to a heavy concentration of managerial power. Although SOEs tend to perform better on average, a heavy concentration of managerial power significantly hurts the performance of all firms, especially SOEs.

Audits can be an effective corporate governance tool, reducing agency problems originating in the conflicting interests of shareholders and managers of publicly listed firms. Based on an analysis of Chinese listed manufacturing firms, this study demonstrates that long, stable firm-auditor relationships reduce the likelihood of a heavy concentration of managerial power, mitigate the negative impact of heavily concentrated managerial power on firm performance and improve firm performance overall.

However, the way audits are identified is critical. Although long, stable firm-auditor relationships reduce agency problems and boost firm performance, firms paying high auditing fees have, on the contrary, a higher likelihood of a heavy concentration of managerial power and worse firm performance overall. This suggests the existence of conflicts of interest in fee-based audits.

These results are robust to propensity score matching (PSM) and entropy balancing matched sample analysis. The results demonstrate the effectiveness of long-term stable firm-audit relationships as a tool in corporate governance but suggest the existence of conflicts of interest in fee-based auditing, which exacerbate agency costs.

One limitation of the current study is that due to availability the empirical analysis considers only the length of the firm-auditor relationship and the reputation of the auditor, but does not consider the auditor's industry expertise. The presence of specialized industry knowledge among auditors may lead to improved efficiency, lower costs, and better audit outcomes. One significant obstacle to studying auditor expertise is the difficulty in identifying individual auditors. While data on the auditing firm is often available, it usually does not include individual identification of the auditor within the firm who actually conducts the audit. Even if such data were available, common names in Chinese

culture further complicate the identification process. Unfortunately, existing research, including the current study tends to overlook the importance of auditor expertise since, without unique identifiers for auditors, it is impossible to accurately evaluate their individual expertise and its impact on audit quality and efficiency.

To address this challenge, it would be necessary to develop a reliable system for tracking individual auditors across time and firms. This would require collaboration between researchers and industry stakeholders to establish a standardized identification system for auditors. By doing so, we can gain a deeper understanding of how auditor expertise influences audit outcomes and develop strategies to improve the overall quality of audits.

Another direction for future research would be to further investigate the impact of audits on type one versus type two agency problems: the conflict of interest between the principal owner of the company and the agent manager of the company versus the conflict of interest among different shareholder owners, generally controlling shareholders and minority shareholders. This study demonstrates that long, stable firm-auditor relationships improve corporate governance and therefore firm performance. Further research can provide more information on how this happens. One possible future research question could be: Does a more stable audit relationship indicate lower divergence among major shareholders? If the answer is affirmative, then a stable auditing relationship may serve as a signal of lower type two agency costs within a firm.

By exploring these research areas, we can gain a deeper understanding of how auditing can play a role in mitigating conflicts of interest among shareholders and promoting better performance and management strategies in firms.

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