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Corporate corruption and future audit fees: Evidence from a quasi-natural experiment

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ABSTRACT

Using a difference-in-differences estimation that relies on China's anti-corruption campaign as a regulatory shock, we report that an exogenous reduction in firm-level corruption leads to lower future audit fees. Further triple difference analyses reveal that the decrease in future audit fees is more significant for firms operating in regions with weak legal environments, strong government control, and weak property rights protection. Government subsidies and related party transactions are channels through which the anti-corruption campaign affects future audit fees. Compared to previous literature, we conclude the effect of corruption on future audit fees is causal.

Introduction

This study investigates whether corporate corruption affects future audit fees. Jha et al. (2020) recently found that auditors charge higher fees when firms are headquartered in regions with more corruption convictions. Their evidence suggests that local corruption environments foster unethical culture and corporate misconduct, weaken financial reporting transparency and corporate internal control, and thus increase audit complexity and effort. However, being in a corrupt region does not automatically mean a firm will undertake wrongdoings. Further, using the count of local officials' convictions as the corruption proxy makes it challenging to identify the causal impacts of local corruption charges on audit fees. A possible reason is that legal sanctions on low-level public officials do not necessarily change the overall regional corrupt environments. Additionally, it is rare for firms to relocate headquarters; hence, local corruption environments are relatively constant. This study aims to contribute to corruption and auditing literature by examining how firm-level corruption affects future audit fees in a quasi-experimental setting.

China is suitable for our investigation for the following reasons. First, firm-level corruption can be inferred from corporate spending on entertainment and travel costs (ETCs). Cai et al. (2011) suggest that ETCs include a greasing money component through which managers bribe powerholders for favors, and a managerial excess component through which managers extract firm resources for private gains. The use of ETCs as a corporate corruption measure is consistent with academic literature (e.g., Huang et al., 2017; Xu et al., 2019; Agarwal et al., 2020; Giannetti et al., 2021; Kong and Qin, 2021; Fang et al., 2022; Griffin et al., 2022) and consistent with government reports.[1] Second, China is chosen as the empirical setting because of

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[1] The central government in China has been treating ETCs as key official measures of corruption in the context of policy development. For example, the Work Report of The Fifth Plenary Session of the 18th Central Commission for Discipline Inspection (CCDI) states that party committees and governments at all layers "need to investigate the problem of excessive expenses on eating, drinking, traveling, and gift-giving, and strengthen the implementation of the central government's regulations on expenses regarding receptions and vehicles." Similar statements appear in many other CCDI official reports.

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its 2012 anti-corruption campaign, leading to a significant reduction in ETCs (Giannetti et al., 2021; Hu, 2021; Fang et al., 2022; Griffin et al., 2022) and thus providing an experimental setting to examine the impact of the reduction in corruption via ETCs on future audit fees.

The baseline evidence first reports a positive association between firm-level corruption (proxied by the natural logarithm of ETCs in year *t*) and future audit fees (proxied by the natural logarithm of audit fees in year *t* + 1), consistent with our expectations. The anti-corruption campaign significantly mitigates the strength of the positive association. The results are robust to the inclusion of a variety of firm-level characteristics, year fixed effects, and location and industry (or firm) fixed effects.

We next construct a quasi-experiment to analyze the impact of the exogenous reduction in corruption through ETCs on future audit fees. Consistent with prior literature (Hope et al., 2020; Giannetti et al., 2021; Hu 2021; Fang et al., 2022), we classify the year 2012 as the pre-campaign period because the campaign formally starts from December 2012 and has limited effects on 2012 ETCs.[2] Similar to Giannetti et al. (2021) and Fang et al. (2022), we define firms with lavish ETCs in 2012 as corrupt firms that face heightened political risks during anti-corruption crackdowns (treatment group), while firms with ETCs equal to or below the industry median in 2012 are classified as the control group (control group).

Using a difference-in-differences (DID) method, we find that corrupt firms pay more audit fees than normal firms before the anti-corruption campaign. After the campaign, corrupt firms experience a 4.59% decrease in future audit fees relative to normal firms. The dynamic DID analyses show that the negative effects of anti-corruption crackdowns on future audit fees are clustered in the years after the campaign. Robustness checks show that DID results hold up to the use of alternative samples, alternative treatment assignments, and a propensity score matching (PSM) approach.

We employ a difference-in-difference-in-differences (triple difference) framework to examine cross-sectional heterogeneity. Literature suggests that corruption is more severe for firms in regions with weak juridical efficiency and strong government control (e.g., Shleifer and Vishny, 1993; Mauro, 1995; Fisman and Miguel, 2007). The results show that auditors charge higher fees for corrupt firms in provinces with weak legal environments, strong government control, and weak property rights protection. Correspondingly, the reduction in future audit fees is more significant for corrupt firms in regions, as mentioned above. As such, the results imply that weak legal environments, strong government control, and weak property rights protection reinforce the relationship between corruption and audit fees.

We explore economic channels for how reduced corruption causes a decrease in future audit fees. Prior literature shows that ETCs serve as greasing money to obtain political favors, such as government subsidies (Fang et al., 2022). Moreover, controlling shareholders in corrupt firms are likely to engage in self-dealing transactions, extracting private control benefits at the expense of minority shareholders (La Porta et al., 1999; Johnson et al., 2000). Accounting literature shows that government subsidies and related party transactions in China are earnings management tools (Chen et al., 2008; Jian and Wong, 2010), weakening reporting transparency and increasing auditing effort. We find that the anti-corruption campaign reduces future audit fees for corrupt firms because the campaign has significantly curbed corrupt firms' abilities to receive more government subsidies and undertake related party transactions.

Further supplementary analyses present additional identification tests to enhance the causal interpretation. The positive association between corruption and future audit fees is strengthened by first- and long-differencing models and a Heckman (1979) method to correct for selection bias arising from missing data on ETCs.

Finally, following previous accounting literature (e.g., Dass et al., 2014; Boland et al., 2017; Chen et al., 2020; Jha et al., 2020), we assess the effect of local corruption environments (proxied by the count of local officials' corruption convictions) on future audit fees. We do not find significant evidence for the positive influences of local corruption environments on future audit fees after controlling for the current effects of audit fees on future audit fees. However, our main results regarding the impact of firm-level ETCs remain significantly positive after controlling for local corruption environments.

The present study provides the following contributions. Our study belongs to broad literature examining consequences of corruption (e.g., Murphy et al., 1993; Mauro, 1995; Liu, 2016) and determinants of audit fees (e.g., Carcello et al., 2002; Hay et al., 2006; Boo and Sharma, 2008; Leventis et al., 2011; Jha and Chen, 2014; Ghafran and O'Sullivan, 2017; Barua et al., 2020; Hsieh et al., 2020; Jha et al., 2020; Tong et al., 2022). We add to corruption and auditing literature by showing that curbing corruption can lower corporate spending on audit fees.

Our study also aligns with recent studies examining the economic consequences of China's anti-corruption campaign. Prior literature has documented that the anti-corruption campaign has improved resource allocation efficiency (Giannetti et al., 2021; Fang et al., 2022), the impartiality of land market transactions (Chen and Kung, 2019), entrepreneurship (Kong and Qin, 2021), financial reporting transparency (Hope et al., 2020; Hu, 2021), and stock price performance (Hu et al., 2020). We add to this strand of literature by examining the effects of the campaign on audit costs. Our findings have policy implications. We inform regulators and policymakers that an anti-corruption campaign can generate positive externalities for firms because it lowers corporate audit costs by reducing corruption.

Although Jha et al. (2020) recently examined the interplay between corruption and audit fees, the present study differs in terms of corruption proxies, economic mechanisms, and research design.

Specifically, we investigate the role of corruption at the firm level, allowing us to more accurately capture the impact of firm-level corruption on audit fees in the Chinese context, whereas Jha et al. (2020) examine the effect of corruption at the

[2] The findings of Fang et al. (2022), Griffin et al. (2018) and Hu (2021) confirm that ETCs peaked in 2012.

macro level. Our supplementary analyses show that, in the Chinese context, the explanatory power of corrupt environments for future audit fees is weak, particularly when more rigorous dynamic models are employed. Our results regarding the effect of firm-level corruption hold after controlling for alternative macro-level corruption proxies, indicating that auditors in China incorporate a firm's spending on corruption rather than its external corrupt environment into their audit charges. This finding is consistent with the arguments put forth by Glaeser and Saks (2006) and Budsaratragoon and Jitmaneeroj (2020) that the number of local corruption convictions is a relatively noisy measure. Our evidence aligns with the recommendations of other corruption scholars, such as Olken (2006), Fisman and Miguel (2007), and Mironov (2015), who advocate for using more objective and direct corruption measures at the micro-level in academic research.

In addition, the economic mechanisms by which corruption influences audit fees differ between Jha et al. (2020) and our study. Jha et al. (2020) find that an *external* corrupt environment increases audit fees by interacting with a firm's *internal* governance. Specifically, a corrupt environment raises audit costs because it increases a firm's bribery sanction risks, disclosure opacity, and financial report restatement probability and decreases a firm's internal control quality. In contrast, the mechanisms in our study are more inside-out. We find that the effect of corrupt expenditures (as an indicator of weak internal governance) on audit fees is more pronounced for firms operating in regions with weak external legal environments.

Our channel analyses also contribute to the existing literature on government subsidies and related party transactions (e.g., Cheung et al., 2006; Chen et al., 2008; Jian and Wong, 2010; Habib et al., 2015; Fang et al., 2022), suggesting government subsidies and related party transactions increase disclosure opacity and audit complexity. We report that a firm's corrupt spending relates positively to the level of government subsidies and related party transactions, and the complexity and obfuscation of these transactions translate into greater audit charges.

Finally, our study employs a quasi-natural experiment to test the causal relationship between corruption and audit fees, which differs from the research design of Jha et al. (2020). We demonstrate that the positive impact of corruption on audit fees is likely to be causal, as reducing a firm's corrupt behavior leads to lower future audit fees. Therefore, while Jha et al. (2020) have shown a positive correlation between corruption and audit fees, our study builds on their work and enhances our understanding of how a firm's actual corrupt spending affects audit charges. In particular, our study provides unique and valuable insights into the complex relationship and channels through which firm-level corruption affects audit fees in China.

The structure of this paper is organized as follows. First, we provide a review of prior literature and present our hypotheses. We then discuss the variable constructs and the sampling process. Subsequently, we present the baseline regression results, followed by the details of our quasi-natural experiment and supplementary analyses. Finally, we provide concluding remarks.

Literature review

Institutional background

China has long struggled with corruption, which remains relatively high compared to other major economic powers.[3] Institutional causes of corporate corruption in China include strong bureaucratic influences, juridical inefficiencies, high in-group favoritism, and the heavy reliance on *guanxi* to get things done (e.g., Liu, 1983; Fisman et al., 2018; Chen and Kung, 2019). From a cultural perspective, *guanxi* is a critical resource-obtaining mechanism in China, with firms seeking corrupt favors, resources, and opportunities by leveraging their networks (Su and Littlefield 2001; Li, 2011; Barbalet, 2017). Because firms must compete for access to government resources and contracts, they are tempted to use *guanxi* to gain unfair treatment and circumvent arbitrary regulations. Commonly used strategies to build, maintain, and develop *guanxi* with government bureaucrats and business partners include gifts, banquets, receptions, and hospitality services (Xin and Pearce, 1996; Park and Luo, 2001).[4] By hosting lavish banquets and providing expensive gifts to government officials and business partners, firms demonstrate their commitment to the long-term relationship (Steidlmeier 1999; Hu, 2021).

Cai et al. (2011) find that ETCs contain at least two corrupt components. First, ETCs serve as greasing money used by managers to bribe bureaucrats to obtain favors and lubricate government decisions. Second, ETCs serve as executive perquisites used by managers for their private enjoyment. For example, Cai et al. (2011) and Xu et al. (2017) note that managers can submit overstated or fictitious expenses for reimbursement to disguise private spending. Such reimbursement fraud is common in China due to weak internal control and external monitoring. Thus, Chinese media generally views ETCs as a cash "pool" from which managers pay bribes and extract private gains.

In response to the pervasive corruption and extravagance via ETCs in both public and private sectors, the central government implemented the *Eight-Point Regulation* on December 4, 2012. This regulation, issued by the Political Bureau of the Communist Party of China Central Committee, aimed to promote frugality, reduce extravagance, and address waste issues. The regulation directed government officials to limit the use of luxury goods and services, and cut down on banquets, travel, hospitality, and receptions. Although the initial focus of the campaign was on "tigers" (high-ranking officials) and "flies"

[3] For example, the 2020 *Corruption Perception Index* ranks China 78th in all countries and 14th in G20 countries. Lower ranks indicate higher corruption levels.

[4] The taxation law in China and the *Regulation on Work-related Expenses by Top Managers of SOEs* require firms to separately record corporate spending on gifts, banquets, receptions, lodgement, club memberships, and travel into entertainment and travel accounts.

(low-ranking bureaucrats) involved in corruption and extravagance, it was subsequently extended to the business sectors with a series of measures to prevent corruption and improve accountability.

The anti-corruption campaign specifically targeted firms with excessive use of ETCs for bribery, graft, and managerial misappropriation (e.g., Hu, 2021; Fang et al., 2022; Griffin et al., 2022). Several high-profile scandals in early 2013 are associated with the abuse of ETCs to influence government decisions and secure favorable regulatory treatments. For example, China Railway Construction was exposed for spending over 0.837 billion Chinese Yuan on entertainment expenses in 2012. As a result of these scandals, the Central Commission for Discipline Inspection launched anti-corruption investigations into firms with extravagant spending on entertainment and receptions, and those with lavish ETCs were required to provide endorsements and make rectifications.[5] Due to the extensive crackdown on corruption and extravagance by the Chinese government after 2013, firms continuing to spend excessively on ETCs may face increased political scrutiny and media exposure. As such, many firms have reduced their spending on ETCs in response to the campaign (Giannetti et al., 2021). Several academic studies have confirmed a remarkable drop in corporate spending on ETCs after the 2012 anti-corruption campaign (e.g., Hu, 2021; Fang et al., 2022; Griffin et al., 2022).

Hypotheses

Jha et al. (2020) find that firms operating in corrupt environments pay higher audit fees because corrupt environments weaken firms' internal monitoring mechanisms and disclosure transparency. Further, corporate frauds and wrongdoings are more common in corrupt environments (Parsons et al., 2018). As such, auditors need to be more vigilant in performing audit tasks for clients in corrupt regions because failing to detect a client's misconduct and reporting fraud is costly. Higher audit fees in corrupt locations reflect the incorporation of audit complexity and effort into audit charges. Drawing on Jha et al. (2020), we predict future audit fees to be higher for firms spending aggressively on ETCs (referred to as corrupt firms) than firms spending conservatively on ETCs (referred to as normal firms) before the anti-corruption campaign, leading to the following hypothesis:

H1: Corrupt firms have higher future audit fees than normal firms before the anti-corruption campaign.

Given that reducing ETCs is an official goal of the anti-corruption campaign, corrupt firms spending lavishly on ETCs in the pre-campaign period should be more affected by the event. Research by Fang et al. (2022) and Hu (2021) suggests the reduction in ETCs is primarily driven by corrupt firms before the campaign, whereas the event exerts less influence on normal firms with conservative ETCs. Thus, if corruption does drive audit fees, we should see a decline in future audit fees for corrupt firms relative to normal firms after the anti-corruption campaign. This leads to the following hypothesis:

H2: Corrupt firms experience a decrease in future audit fees after the anti-corruption campaign relative to normal firms.

Data and sample

Variable definitions

Following Cai et al. (2011), we assess firm-level corruption using the natural logarithm of a firm's ETCs. Extant literature has noted the superiority of using ETCs over survey-, propensity-, or perception-based corruption measures because ETCs are objective, reliable, and accessible (e.g., Huang et al., 2017; Xu et al., 2019; Agarwal et al., 2020; Giannetti et al., 2021; Hu 2021; Kong and Qin, 2021; Fang et al., 2022; Griffin et al., 2022). We manually collect ETCs from corporate annual reports. We do not code missing ETCs as zeros; instead, we employ a Heckman (1979) approach to address self-selection problems arising from the non-disclosure of ETCs.

The main dependent variable of interest in this study is *Ln Audit Fee* in year $t + 1$, measured by the natural logarithm of audit fees. We use audit fees in year $t + 1$ to examine whether auditors incorporate corporate corruption in their future pricing decisions.[6] Regarding control variables, we first include *Ln Audit Fee in* year t in our model because audit fees are highly persistent (Kacer et al., 2018). Including lagged audit fees in a dynamic model can significantly enhance the explanatory power of predictions and reduce the omitted variable bias (Kacer et al., 2018).

We include *Ln S&A*, selling, and general administrative costs excluding ETCs because entertainment and travel accounts are subcategories of selling and general administrative expenses. We are interested in comparing the explanatory power of ETCs with other normal expenditures. If ETCs are a good proxy for firm-level corruption and auditors incorporate ETCs into audit charges, we expect ETCs to have a stronger effect on audit fees than other normal expenditures.

Other control variables are drawn on prior literature (e.g., Carcello et al., 2002; Hay et al., 2006; Jha and Chen, 2014; Kacer et al., 2018; Jha et al., 2020). Specifically, we use *Ln Asset*, the natural logarithm of total assets, and *Ln Sale*, the natural logarithm of sales revenue, to capture the size and sales effect on audit fees. We include *Ln AR*, the natural logarithm of accounts

[5] Retrieved from People.cn https://finance.people.com.cn/n/2013/0515/c1004-21485245.html and Sina Finance https://finance.sina.com.cn/review/jcgc/20130508/103715387746.shtml.

[6] The use of future audit fees in year $t + 1$ as the dependent variable is more reasonable than current audit fees in our research, because current audit fees can be pre-determined before auditors identify the actual amount of ETCs and detect corruption. For example, an auditor and the client firm may sign the audit fee contract early in a year or even in the previous years. Thus, there is a time-lag effect of ETCs on audit fees.

receivables, and *Ln Inventory*, the natural logarithm of inventory, to control for audit complexity. We add *Unqualified Opinion*, whether an unqualified opinion is issued, because Jha et al. (2020) report a negative association between audit fees and unqualified audit opinion. We add *ABSDA*, the absolute value of discretionary accruals generated by the modified Jones (1991) model in Dechow et al. (1995), because Gul et al. (2003) show a positive association between earnings management and audit fees. We add *MTB*, market-to-book ratio, into our model to control for growth options. We include *Issuing Year*, whether a firm has rights offerings, public offerings, or private placements or not, as equity issuance raises audit complexity and effort. We include *Leverage*, total liabilities divided by total assets; *BHR*, buy and hold returns; *ROA*, net profit divided by total assets; *SD ROA*, standard deviation of return on assets over a five-year rolling window; and *Loss*, whether net profit is negative or not, to capture the effect of financial performance and risk on future audit fees.

We also include a vector of corporate governance variables. Prior literature shows that good governance mechanisms mitigate reporting fraud and managerial wrongdoings, leading to lower audit fees (Carcello et al., 2002; Wang et al., 2008; Bae et al., 2021). Wang et al. (2008) show that big-four auditors in China charge a premium. We include *Big Four*, whether a firm uses a big-four auditor as a control variable. Liu and Subramaniam (2013) find audit fees are significantly lower for state-owned enterprises (SOEs) than non-SOEs because SOEs in China are prone to hire small local auditors. We add *SOE*, whether a firm is ultimately owned by the government, into our model. Gul et al. (2010) find that large institutional and foreign investors can improve a firm's information environment. Analyst coverage promotes reporting transparency by constraining earnings management (Yu, 2008). Thus, we include *Analyst Coverage*, measured by the natural logarithm of the number of analyst issues for a firm. We also add *Institution Share*, percentage of shares held by financial institutions; *Foreign Share*, percentage of shares held by foreign investors; *Ln Analyst*, the natural logarithm of the number of analyst forecasts issued for the firm, to control for the strength of external monitoring. Carcello et al. (2002) find that board characteristics, such as higher board independence, relate to lower audit fees. Thus, we include *Ln Board*, the natural logarithm of the number of board directors, and *Independence*, the ratio of independent directors to the total number of directors, as additional controls to capture board size and independence. Finally, Hope et al. (2020) show that political connections potentially weaken a firm's governance and thus increase reporting opacity. Following Hope et al. (2020), politically connected directors are defined as those who serve as government officials. We include *Political Connection*, the percentage of directors having political connections to total directors, as a control variable.

Sample and data

Panel A of Table 1 shows the sampling process. The sample used in this study includes data on Chinese public firms for the period 2008–2017. The sampling process starts with 24,307 firm-year observations that have audit fees in year $t + 1$. We exclude observations with missing ETCs and other control variables. The final sample consists of 16,575 firm-year observations used for our baseline regression analyses.

Panels B and C of Table 1 present the descriptive statistics for the main variables used in this study and the correlation matrix. The average *Ln Audit Fee*$_{t+1}$ is 13.730, and the average raw audit fees are 1.228 million Chinese Yuan. The average *Ln Corruption* is 16.277, and the average raw spending on entertainment and traveling costs is 31.056 million Chinese Yuan during the sample period. The correlation between *Ln Audit Fee*$_{t+1}$ and *Ln Corruption* is positive and significant at the 1% level, providing initial support to H1.

Baseline evidence

Baseline regression results

To examine the relationship between corporate corruption through ETCs and future audit fees, we estimate the following regression in Eq. (1):

$$LnAuditFee_{t+1} = \beta_0 + \beta_1 LnCorruption_t + \gamma' Controls_t + IndustryandLocationFE(orFirmFE) + YearFE + \varepsilon_t \quad (1)$$

where *Ln Audit Fee*$_{t+1}$ is estimated as the natural logarithm of audit fees in year $t + 1$. The independent variable of interest, *Ln Corruption*, is the natural logarithm of ETCs. *Controls* are a vector of control variables. We include industry fixed effects (*Industry*) and province fixed effects (*Location*) in Eq. (1) to absorb industry differences and location heterogeneity. We add year fixed effects (*Year*) to control for intertemporal variations. We cluster standard errors at the firm level to adjust for the serial correlation (Petersen, 2009).

Table 2 reports our baseline results based on OLS specifications. Column (1) shows a positive and significant coefficient on *Ln Corruption* (0.242, $t = 26.29$, two-tailed) after controlling for industry and province fixed effects. The result shows that a 1% increase in ETCs is associated with an approximately 0.242% increase in future audit fees.

Column (2) shows that the positive effect of corporate corruption on future audit fees holds significantly at the 1% level after including *Ln Audit Fee* as an additional control variable. The enhanced model explanatory power (the adjusted R^2 increases from 23.6% to 87.6%) implies that audit fees in China are highly persistent, consistent with our expectations.

Column (3) shows that the positive effect of corporate corruption on future audit fees holds significantly after including firm-level characteristics and governance variables in the regression model. The coefficient on *Ln S&A* is economically and

Table 1
Sample and Descriptive Statistics.

Panel A Sampling Process

Description		**Observations**
Observations having audit fees in year $t + 1$		24,307
Less observations without corruption data	(4,520)	19,787
Less observations without sufficient control variables	(3,212)	
Total firm-year observations used in this study		16,575

Panel B Descriptive Statistics

Variables	**N**	**Mean**	**SD**	**P5**	**P25**	**Median**	**P75**	**P95**
Ln Audit Fee$_{t+1}$	16,575	13.730	0.669	12.821	13.305	13.653	14.078	14.931
Audit Fee$_{t+1}$ (*in million*)	16,575	1.228	1.504	0.370	0.600	0.850	1.300	3.050
Ln Corruption	16,575	16.277	1.344	14.108	15.429	16.244	17.079	18.598
Corruption (*in million*)	16,575	31.056	68.656	1.339	5.018	11.338	26.130	119.447
Ln Audit Fee	16,575	13.629	0.669	12.737	13.142	13.528	13.994	14.845
Ln S&A	16,575	19.035	2.095	17.329	18.350	19.069	19.923	21.398
Ln Asset	16,575	21.996	1.244	20.260	21.111	21.858	22.713	24.249
Ln Sale	16,575	21.276	1.443	19.152	20.330	21.174	22.148	23.838
Ln AR	16,575	19.072	2.249	15.676	18.295	19.345	20.273	21.756
Ln Inventory	16,575	19.377	2.825	16.296	18.629	19.630	20.665	22.512
Unqualified Opinion	16,575	0.965	0.184	1.000	1.000	1.000	1.000	1.000
Issuing Year	16,575	0.146	0.353	0.000	0.000	0.000	0.000	1.000
ABSDA	16,575	0.062	0.065	0.004	0.019	0.042	0.082	0.191
MTB	16,575	4.699	4.948	1.655	2.541	3.567	5.154	10.617
Leverage	16,575	0.455	0.673	0.103	0.266	0.435	0.604	0.806
BHR	16,575	0.218	0.682	−0.442	−0.210	0.036	0.434	1.467
ROA	16,575	0.037	0.055	−0.048	0.013	0.034	0.064	0.124
SD ROA	16,575	0.030	0.034	0.003	0.010	0.019	0.036	0.094
Loss	16,575	0.094	0.292	0.000	0.000	0.000	0.000	1.000
Big Four	16,575	0.045	0.207	0.000	0.000	0.000	0.000	0.000
SOE	16,575	0.390	0.488	0.000	0.000	0.000	1.000	1.000
Institution Share	16,575	0.386	0.228	0.025	0.197	0.392	0.563	0.754
Foreign Share	16,575	0.014	0.063	0.000	0.000	0.000	0.000	0.030
Ln Analyst	16,575	1.540	1.122	0.000	0.693	1.609	2.485	3.296
Ln Board	16,575	2.144	0.200	1.792	1.946	2.197	2.197	2.398
Independence	16,575	0.373	0.052	0.333	0.333	0.333	0.429	0.455
Political Connection	16,575	0.078	0.108	0.000	0.000	0.000	0.125	0.286

Panel C: Correlation Matrix

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	*Ln Audit Fee*$_{t+1}$	**1.00**														
2	*Ln Corruption*	**0.49**	**1.00**													
3	*Ln Audit Fee*	**0.94**	**0.49**	**1.00**												
4	*Ln S&A*	**0.35**	**0.39**	**0.36**	**1.00**											
5	*Ln Asset*	**0.73**	**0.55**	**0.74**	**0.40**	**1.00**										
6	*Ln Sale*	**0.66**	**0.59**	**0.67**	**0.48**	**0.86**	**1.00**									
7	*Ln AR*	**0.40**	**0.47**	**0.40**	**0.27**	**0.46**	**0.52**	**1.00**								
8	*Ln Inventory*	**0.33**	**0.35**	**0.34**	**0.31**	**0.49**	**0.53**	**0.34**	**1.00**							
9	*Unqualified Opinion*	**0.03**	**0.13**	**0.03**	**0.08**	**0.13**	**0.17**	**0.14**	**0.15**	**1.00**						
10	*Issuing Year*	**0.12**	**0.09**	**0.11**	**0.05**	**0.15**	**0.10**	**0.14**	**0.05**	**0.06**	**1.00**					
11	*ABSDA*	**−0.04**	**−0.09**	**−0.06**	**−0.06**	**−0.06**	**−0.07**	**−0.09**	**−0.03**	**−0.12**	**0.06**	**1.00**				
12	*MTB*	**−0.03**	**−0.13**	**−0.04**	**−0.10**	**−0.15**	**−0.15**	**−0.15**	**−0.13**	**−0.22**	**−0.07**	**0.10**	**1.00**			
13	*Leverage*	**0.08**	**0.01**	**0.08**	0.02	**0.09**	**0.08**	**−0.03**	**0.04**	**−0.17**	**−0.02**	**0.11**	**0.08**	**1.00**		
14	*BHR*	**−0.07**	**−0.05**	**−0.08**	**−0.03**	**−0.11**	**−0.09**	**−0.04**	**−0.07**	0.01	**0.05**	**0.05**	**0.18**	0.01	**1.00**	
15	*ROA*	−0.02	**0.16**	**−0.03**	**0.07**	0.01	**0.09**	**0.03**	**−0.04**	**0.25**	**0.01**	**−0.04**	**−0.15**	**−0.16**	**0.08**	**1.00**
16	*SD ROA*	**−0.08**	**−0.19**	**−0.09**	**−0.11**	**−0.21**	**−0.22**	**−0.22**	**−0.20**	**−0.30**	0.00	**0.23**	**0.23**	**0.17**	0.02	**−0.18**
17	*Loss*	−0.02	**−0.11**	−0.01	**−0.04**	**−0.08**	**−0.12**	**−0.09**	**−0.04**	**−0.26**	−0.06	**0.10**	**0.19**	**0.11**	**−0.03**	**−0.63**
18	*Big Four*	**0.39**	**0.20**	**0.41**	**0.12**	**0.31**	**0.28**	**0.14**	**0.13**	0.02	**−0.03**	**−0.04**	**−0.03**	**0.03**	−0.02	**0.03**
19	*SOE*	**0.16**	**0.06**	**0.17**	**0.08**	**0.31**	**0.30**	**0.03**	**0.17**	0.00	**−0.04**	**−0.05**	**0.03**	**0.09**	**−0.05**	**−0.14**
20	*Institution Share*	**0.26**	**0.20**	**0.27**	**0.17**	**0.38**	**0.38**	**0.12**	**0.18**	**0.06**	**0.03**	**−0.05**	**0.07**	**0.04**	0.00	**0.09**
21	*Foreign Share*	**0.27**	**0.10**	**0.29**	**0.08**	**0.18**	**0.16**	**0.07**	**0.08**	**−0.02**	**−0.04**	**−0.02**	0.02	**0.05**	−0.01	−0.01
22	*Ln Analyst*	**0.24**	**0.39**	**0.23**	**0.26**	**0.35**	**0.37**	**0.25**	**0.14**	**0.17**	**0.12**	**−0.03**	**−0.14**	**−0.06**	**0.04**	**0.41**
23	*Ln Board*	**0.14**	**0.16**	**0.15**	**0.11**	**0.25**	**0.25**	**0.10**	**0.12**	0.00	0.00	**−0.06**	**−0.04**	**0.03**	**−0.03**	0.00
24	*Independence*	**0.04**	**0.00**	**0.04**	0.00	0.01	**−0.02**	0.01	0.00	0.00	0.01	**0.02**	**0.03**	0.00	0.00	−0.02
25	*Political Connection*	**0.03**	**0.05**	**0.02**	0.02	**0.03**	**0.04**	0.01	**0.06**	**0.04**	0.00	0.00	**−0.02**	−0.01	**0.04**	**0.04**

Table 1 (*continued*)

	Variables	16	17	18	19	20	21	22	23	24	25
	Variables	16	17	18	19	20	21	22	23	24	25
16	*SD ROA*	**1.00**									
17	*Loss*	**0.28**	**1.00**								
18	*Big Four*	**−0.05**	**−0.03**	**1.00**							
19	*SOE*	−0.01	**0.07**	**0.11**	**1.00**						
20	*Institution Share*	**−0.10**	**−0.04**	**0.17**	**0.34**	**1.00**					
21	*Foreign Share*	0.01	0.02	**0.33**	**0.13**	**0.13**	**1.00**				
22	*Ln Analyst*	**−0.18**	**−0.23**	**0.14**	**−0.08**	**0.23**	**0.01**	**1.00**			
23	*Ln Board*	**−0.05**	−0.01	**0.07**	**0.26**	**0.18**	**0.08**	**0.11**	**1.00**		
24	*Independence*	0.01	0.01	**0.04**	**−0.07**	**−0.05**	**0.02**	−0.01	**−0.50**	**1.00**	
25	*Political Connection*	**−0.03**	**−0.03**	**0.06**	−0.01	**0.02**	0.02	**0.08**	0.02	**0.03**	**1.00**

statistically insignificant (0.001, t = 1.26, two-tailed), suggesting no significant correlation between normal selling and general administrative expenditures and future audit fees. This finding implies auditors can differentiate corrupt expenditures from normal expenditures when determining future audit charges. That is, auditors incorporate corrupt expenditures rather than normal expenses into their audit charges.

The coefficients on control variables are generally consistent with expectations. Future audit fees relate positively to firm size (*Ln Asset*), sales (*Ln Sale*), and accounts receivables (*Ln AR*). We find a negative coefficient on *Ln Inventory*. The result implies that inventory is not an appropriate measure of audit complexity in China. However, the result is consistent with Wang et al. (2008) and Liu and Subramaniam (2013) using Chinese data.[7] The negative coefficient on *Unqualified Opinion* shows future audit fees are higher when audit reports are qualified or modified, a result consistent with Hay et al. (2006) and Jha et al. (2020). The coefficient on *Issuing Year* is significantly positive, suggesting future audit fees are higher for firms with new equity issuance. The positive and significant coefficient on *ABSDA* implies higher earnings management and financial reporting opacity positively affect future audit fees. Finally, we report a positive association between future audit fees and a firm's growth opportunities and stock performance.

In terms of corporate governance variables, the coefficient on *Big Four* is significantly positive. Consistent with Wang et al. (2008), the result suggests big-four auditors charge a premium in China. The negative coefficient on *SOE* shows SOEs have lower future audit costs. This finding is consistent with Liu and Subramaniam (2013), indicating that SOEs are more likely to hire small local auditors than non-SOEs. Moreover, we find institutional ownership and board size relate negatively to future audit fees. A possible reason is that firms with more sophisticated investors and a larger board are less likely to manipulate earnings (Xie et al., 2003; Koh, 2007), thus negatively affecting future audit fees. Finally, the coefficient on *Foreign Share* is significantly positive. The result is unsurprising because firms issuing B-shares and H-shares in China need to adjust accounting numbers using China's accounting standards to those using International Financial Reporting Standards or Hong Kong Accounting Standards. Thus, firms with higher foreign ownership have relatively greater audit complexity and fees.

In column (4), we use firm fixed effects to replace industry and location fixed effects. The positive relationship between corporate corruption and future audit fees holds up to the inclusion of firm fixed effects. However, the coefficients on *SOE* and *Foreign Share* turn out to be insignificant.

The effect of the anti-corruption campaign

We examine whether the anti-corruption campaign has curbed the positive effect of corporate corruption on future audit fees. To do so, we construct an indicator variable, *Post*, denoting the post-campaign period (years 2013–2017) and interact with *Ln Corruption*. We expect a negative coefficient on the interaction term *Ln Corruption* × *Post* in Eq. (2). Note that we have included *Year FE* as controls to absorb time fixed effects; thus, *Post* dropped from the model due to the multicollinearity problem.

$$LnAuditFee_{t+1} = \beta_0 + \beta_1 LnCorruption_t + \beta_2 LnCorruption_t \times Post_t + \gamma' Controls_t + IndustryandLocationFE(orFirmFE) + YearFE + \varepsilon_t \tag{2}$$

Column (5) shows a positive and significant coefficient on *Ln Corruption* (0.020, t = 7.54, two-tailed), supporting a positive relationship between corruption and future audit fees before the anti-corruption campaign. A negative and significant coefficient on *Ln Corruption* × *Post* suggests the 2012 anti-corruption campaign mitigated the positive relationship between corruption and future audit fees. The F-test of *Ln Corruption* + *Ln Corruption* × *Post* is 9.87 (p = 0.002, two-tailed) and significant

[7] In untabulated robustness checks, we scale account receivables and inventory by total assets. The signs of the coefficients remain the same.

Table 2
Corruption and Future Audit Fees.

	Ln Audit Fee $_{t+1}$											
	(1)		**(2)**		**(3)**		**(4)**		**(5)**		**(6)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Ln Corruption	0.242***	(26.29)	0.020***	(11.41)	0.010***	(5.44)	0.025***	(4.71)	0.020***	(7.54)	0.037***	(6.20)
LnCorruption × Post									−0.013***	(−4.84)	−0.015***	(−4.29)
Ln Audit Fee			0.915***	(196.38)	0.832***	(79.88)	0.411***	(17.65)	0.832***	(79.98)	0.412***	(17.71)
Ln S&A					0.001	(1.26)	0.002	(1.49)	0.001	(1.38)	0.003	(1.64)
Ln Asset					0.049***	(9.89)	0.119***	(9.93)	0.049***	(9.85)	0.119***	(9.92)
Ln Sale					0.009***	(2.71)	0.024***	(2.87)	0.009***	(2.68)	0.024***	(2.87)
Ln AR					0.004***	(3.10)	0.002	(0.76)	0.004***	(3.05)	0.002	(0.68)
Ln Inventory					−0.003***	(−2.66)	−0.004**	(−2.07)	−0.003***	(−2.64)	−0.004*	(−1.94)
Unqualified Opinion					−0.024*	(−1.93)	−0.053***	(−3.01)	−0.026**	(−2.05)	−0.055***	(−3.12)
Issuing Year					0.027***	(5.04)	0.015***	(2.77)	0.027***	(5.03)	0.014***	(2.62)
ABSDA					0.105***	(3.30)	0.045	(1.16)	0.105***	(3.31)	0.044	(1.13)
MTB					0.003***	(4.53)	0.003***	(2.99)	0.003***	(4.25)	0.003***	(2.71)
Leverage					0.002	(0.90)	0.008**	(2.41)	0.002	(0.95)	0.008**	(2.20)
BHR					0.026***	(6.12)	0.019***	(3.99)	0.026***	(6.09)	0.019***	(4.02)
ROA					−0.043	(−0.83)	0.092	(1.23)	−0.050	(−0.98)	0.078	(1.04)
SD ROA					0.107	(1.64)	0.230*	(1.85)	0.122*	(1.87)	0.254**	(2.03)
Loss					−0.004	(−0.47)	0.014	(1.29)	−0.005	(−0.60)	0.012	(1.13)
Big Four					0.063***	(5.25)	0.071**	(2.43)	0.062***	(5.21)	0.072**	(2.50)
SOE					−0.022***	(−4.60)	−0.012	(−0.50)	−0.023***	(−4.80)	−0.013	(−0.55)
Institution Share					−0.032***	(−3.51)	−0.031*	(−1.86)	−0.032***	(−3.46)	−0.032*	(−1.94)
Foreign Share					0.113***	(3.36)	0.229	(0.73)	0.111***	(3.28)	0.246	(0.81)
Ln Analyst					0.001	(0.56)	0.006*	(1.89)	0.001	(0.51)	0.006*	(1.70)
Ln Board					−0.029***	(−2.71)	0.015	(0.53)	−0.030***	(−2.81)	0.014	(0.50)
Independence					0.020	(0.53)	0.104	(1.37)	0.013	(0.35)	0.096	(1.26)
Political Connection					0.014	(0.76)	0.008	(0.29)	0.012	(0.67)	0.006	(0.20)
Constant	9.790***	(67.10)	0.927***	(18.78)	0.876***	(11.67)	4.457***	(18.13)	0.740***	(8.99)	4.264***	(16.69)
Observations	16,575		16,575		16,575		16,575		16,575		16,575	
Adj R^2	0.236		0.876		0.883		0.903		0.883		0.903	
Industry FE	Y		Y		Y		N		Y		N	
Location FE	Y		Y		Y		N		Y		N	
Firm FE	N		N		N		Y		N		Y	
Year FE	Y		Y		Y		Y		Y		Y	
F-test of *Ln Corruption* + *Ln Corruption* × *Post* (*p*-value)									9.87*** (0.0017)		15.17*** (0.0001)	

at the 1% level, indicating that the positive effect of corruption on future audit fees continues to be significant and positive for observations in the post-campaign period. Our results regarding the effect of the 2012 campaign on the relationship between corruption and future audit fees remain qualitatively the same when using firm fixed effects as controls in column (6).[8]

Collectively, the above preliminary evidence presents a positive association between corporate corruption and future audit fees. Although the positive association persists into the post-campaign period, the positive effect of corruption on future audit fees is indeed lessened by the anti-corruption campaign.

Quasi-natural experiment

Treatment and control assignment

In this section, we present our quasi-natural experiment by relying on China's 2012 anti-corruption campaign as a negative shock to corporate corruption. Following Giannetti et al. (2021), Hope et al. (2020), Hu (2021), and Griffin et al. (2022), we classify the year 2012 as the pre-campaign period because the anti-corruption campaign starts from December 2012, and the effect on 2012 ETCs is limited. We narrow the sample into a four-year window surrounding the 2012 campaign to isolate the effect of other noisy events. We define 2011–2012 as the pre-campaign period (*Post* = 0) and 2013–2014 as the post-campaign period (*Post* = 1).

We argue that firms spending aggressively on ETCs in the pre-campaign period are likely to be corrupt firms and thus more exposed to the anti-corruption campaign than other firms (Giannetti et al., 2021). We bin the sample into two groups to identify firms affected by the campaign, using industry median ETCs in 2012 as the cut-off. We define corrupt firms as those whose ETCs in 2012 are above the industry median (*Treat* = 1). We define normal firms as those whose 2012 ETCs are equal to or below the industry median (*Treat* = 0).

We perform validation tests in Panel A of Table 3 to assess the credibility of the shock effect and our treatment assignment. We regress *Ln Corruption* on *Post* and a set of control variables, based on the full sample (2008–2017) in column (1) and the DID sample (2011–2014) in column (2) of Panel A. The coefficients on *Post* in both columns are significantly negative, confirming a significant drop in corruption through ETCs following the 2012 campaign and consistent with Hu (2021) and Griffin et al. (2022).

To check if our treatment firms are indeed capturing corrupt firms that are most affected by the campaign, we add *Treat*, *Post*, and *Treat* × *Post* and the same set of control variables in column (3). A significant and positive coefficient on *Treat* indicates that treatment firms are indeed corrupt firms before the campaign. The coefficient on *Post* is insignificant, meaning control firms do not experience significant changes in ETCs after the campaign. This result indicates that firms spending conservatively on ETCs are likely to be uncorrupted firms and are unaffected by the campaign. Thus, changes in audit fees for normal firms surrounding the anti-corruption campaign provide a good benchmark for comparison. Finally, the coefficient on *Treat* × *Post* is negative and significant at the 1% level, showing the drop in ETCs is primarily driven by treatment firms. These validation tests confirm that the anti-corruption campaign has significantly reduced treatment firms' corruption levels but has no significant effects on control firms, further strengthening the credibility of our treatment assignment.

DID results

H1 predicts that corrupt firms have higher future audit fees than normal firms before the anti-corruption campaign. H2 predicts that corrupt firms experience a decrease in future audit fees after the campaign. We estimate the DID model in Eq. (3). We expect a positive coefficient on *Treat* to be consistent with H1 and a negative coefficient on *Treat* × *Post* to be consistent with H2.

$$LnAuditFee_{t+1} = \beta_0 + \beta_1 Treat_t + \beta_2 Treat_t \times Post_t + \beta_3 Post_t + \gamma\prime Controls_t + IndustryandLocationFE + \varepsilon_t \quad (3)$$

Panel B of Table 3 reports the DID results. Consistent with H1, we find a positive and significant coefficient on Treat in column (1), suggesting corrupt firms pay more audit fees than normal firms before the campaign (*t* = 5.88, two-tailed). The magnitude is economically significant, showing that future audit fees for corrupt firms are 5.13% [($e^{0.050}$ –1) × 100] higher than normal firms before the campaign.

The coefficient on Post is not distinguishable from zero, indicating that normal firms do not experience significant changes in future audit fees after the campaign. Most importantly, the coefficient on Treat × Post is significantly negative at the 1% level (*t* = -4.57, two-tailed). The result supports H2, showing that corrupt firms experience a decrease in future audit fees subsequent to the campaign relative to normal firms. The change is economically significant, with future audit fees decreasing by 4.59% [(1 - $e^{-0.047}$) × 100].[9]

[8] In untabulated robustness checks, we split the sample into pre-campaign and post-campaign subsamples. The coefficients on *Ln Corruption* are significantly positive at the 1% levels in both subsamples, suggesting a positive correlation between corrupt spending and future audit fees. The positive effect of corruption on future audit fees is significantly smaller after the anti-corruption campaign, consistent with our main analysis.

[9] In untabulated robustness checks, we re-run our DID model by using the raw amount of future audit fees (in millions) as the dependent variable to examine the effect of the 2012 anti-corruption campaign on the face value of the audit costs. The coefficient on *Treat* × *Post* is −0.057 and significant at the 5% level. The result suggests that relative to normal firms, the reduction in future audit fees for corrupt firms is roughly 57,000 Chinese Yuan. We caution that estimates using raw audit fees as the dependent variable might be biased by extreme values.

Table 3
Corruption and Future Audit Fees: DID Specifications.

Panel A: Validating Shock Effect and Treatment Assignment

	Ln Corruption$_{t+1}$					
	(1) Full Sample		**(2) DID Sample**		**(3) DID Sample**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Post	−0.227***	(−10.61)	−0.129***	(−6.63)	−0.035	(−1.59)
Treat × Post					−0.088***	(−3.35)
Treat					1.296***	(36.13)
Observations	16,575		7,741		7,741	
Adj R^2	0.488		0.516		0.669	
Controls	Y		Y		Y	
Industry FE	Y		Y		Y	
Location FE	Y		Y		Y	

Panel B: DID Results

	Ln Audit Fee$_{t+1}$			
	(1)		**(2)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**
Treat	0.050***	(5.88)	0.040***	(3.72)
Treat × Post	−0.047***	(−4.57)		
Post	0.003	(0.42)		
Treat × YR11			0.015	(0.77)
Treat × YR13			−0.048***	(−3.50)
Treat × YR14			−0.029**	(−1.98)
YR11			0.071***	(5.93)
YR13			0.029***	(2.92)
YR14			0.015	(1.35)
Ln Audit Fee	0.786***	(43.78)	0.795***	(42.26)
Ln S&A	0.005	(1.63)	0.006*	(1.84)
Ln Asset	0.058***	(6.97)	0.058***	(6.88)
Ln Sale	0.014***	(2.88)	0.012**	(2.54)
Ln AR	0.003	(1.56)	0.003*	(1.67)
Ln Inventory	−0.002	(−1.01)	−0.002	(−1.04)
Unqualified Opinion	−0.018	(−1.00)	−0.016	(−0.85)
Issuing Year	0.022**	(2.32)	0.019*	(1.96)
ABSDA	0.102**	(1.99)	0.074	(1.47)
MTB	0.003***	(3.29)	0.003***	(2.89)
Leverage	0.003	(1.03)	0.002	(0.98)
BHR	0.015*	(1.69)	0.034***	(3.82)
ROA	−0.031	(−0.38)	−0.055	(−0.69)
SD ROA	0.246**	(2.42)	0.251**	(2.46)
Loss	−0.007	(−0.54)	−0.005	(−0.40)
Big Four	0.091***	(4.87)	0.085***	(4.50)
SOE	−0.009	(−1.34)	−0.012*	(−1.81)
Institution Share	−0.033**	(−2.45)	−0.035***	(−2.59)
Foreign Share	0.148***	(3.11)	0.131***	(2.75)
Ln Analyst	−0.004	(−1.44)	−0.005*	(−1.82)
Ln Board	−0.012	(−0.73)	−0.012	(−0.74)
Independence	0.088	(1.60)	0.089*	(1.66)
Political Connection	0.008	(0.29)	0.003	(0.11)
Constant	1.329***	(10.08)	1.211***	(8.80)
Observations	7,741		7,741	
Adj R^2	0.863		0.864	
Industry FE	Y		Y	
Location FE	Y		Y	

We employ a dynamic DID model to assess the parallel time trends assumption. We use the year 2012 as the benchmark year. We add one pre-campaign year variable (*YR11*) and two post-campaign year variables (*YR13* and *YR14*) into our DID model and interact them with the treatment variable. The results in column (2) of Panel B show an insignificant coefficient on *Treat* × *YR11*, suggesting no significant pre-treatment trends. The coefficients on *Treat* × *YR13* and *Treat* × *YR14* are significantly negative, indicating that the effect of the anti-corruption campaign on future audit fees indeed occurs in the years after the shock. The dynamic analysis is consistent with a causal interpretation—an exogenous reduction in corruption leads to lower future audit fees.

Robustness checks

We conduct a battery of robustness tests to validate our findings in Table 4. First, we re-run our DID regressions using three alternative samples in Panel A: first, a balanced sample that requires firms to have no missing values in row (1); second, a six-year sample, where years 2010–2012 (2013–2015) are the pre- (post-) campaign period in row (2); third, an eight-year sample, where years 2009–2012 (2013–2016) are the pre- (post-) campaign period in row (3). The significantly negative coefficients on *Treat* × *Post* and the significantly positive coefficients on *Treat* are consistent with the early findings.

Second, we consider alternative treatment assignments in Panel B of Table 4. We bin firms into five groups based on the quintile rank of 2012 ETCs in row (4). In this method, *Treat* is a categorical variable, where 4 and 3 denote the most-affected firms, 2 denotes medium-affected firms, and 1 and 0 denote the least-affected firms. We require the industry year to have at least three observations, five observations in row (4), to make a proper quintile bin. Again, we obtain a significantly positive coefficient on *Treat*, and a significantly negative coefficient *Treat* × *Post* in row (4).

A concern is that using 2012 ETCs as the cut-off to assignment treatment and control groups may be noisy because it may simply reflect a spending surprise in 2012. To mitigate this concern, we assess a firm's pre-campaign corruption level using 2011–2012 average ETCs, similar to Giannetti et al. (2021). We divide firms into corrupt and normal groups based on the sample median pre-campaign ETCs. Row (5) shows that our DID results remain the same by using this assignment.

Finally, we use a revised DID model by substituting firm and year fixed effects for *Treat*, *Post*, and industry and location fixed effects in row (6) of Panel C. The negative coefficient on *Treat* × *Post* is weakly significant at the 10% level.

Propensity score matching

Although our DID design explicitly includes covariates as controls, there may still be a concern that covariate imbalances between treatment and control groups confound previous DID results. To mitigate this concern, we use the nearest neighbor matching technique *with* replacement to match each corrupt firm to a normal firm based on their observable characteristics in 2012. This approach allows for control firms to be matched to more than one treatment firm. We set the caliper at 0.25 times the standard error of the estimated propensity scores.

We begin the matching by estimating a probit model, where the dependent variable (*Treat*) equals 1 if a firm is classified as a corrupt firm and 0 otherwise. The independent variables are control variables used in column (3) of Table 2. The probit regression result is presented in Panel A of Appendix B. Column (1) uses the full sample, and column (2) uses a balanced sample where firms have non-missing data during 2011–2014. We find that firms with higher *Ln Audit Fee*, *Ln S&A*, *Ln Asset*, *Ln AR*, *ROA*, and *Ln Analyst* are more likely to be classified as corrupt firms.

Panels B and C of Appendix B check whether the PSM eliminates the observable differences between corrupt and normal firms based on the full and balanced samples, respectively. Panels B and C show that despite some variables remaining significant, the covariate differences between corrupt and normal firms become statistically insignificant or smaller after matching. The only exception for *BHR* turns out to be slightly more biased after matching.[10]

Row (7) in Panel D of Table 4 presents the DID-PSM results using the full sample, whereas row (8) uses the balanced sample. Again, we obtain significantly positive coefficients on *Treat* and significantly negative coefficients on *Treat* × *Post*, consistent with previous findings.

Taken together, our DID results show the exogenous reduction in corporate corruption caused by the anti-corruption campaign results in a decrease in future audit fees.

Cross-sectional heterogeneity

In this section, we examine whether the effect of corporate corruption on future audit fees varies cross-sectionally with legal environments, using a triple difference model. Fisman and Miguel (2007) find corruption is more prevalent in areas with weak legal environments. Firms in regions with strong government control and weak property rights protection rely more on government-related resources to survive and are thus more vulnerable to government expropriation (Murphy et al., 1993; Shleifer and Vishny, 1993; Mauro, 1995). In addition, the importance of legal environments for corporate governance has been discussed in detail by La Porta et al. (1998) and La Porta et al. (2000). Using data from China, Park and Luo (2001) report that firms in provinces with weak juridical efficiencies are more likely to use *guanxi* to enforce business contracts and access crucial resources. In this sense, audit fees should be higher for corrupt firms operating in regions with weak legal environments, strong government control, and weak property rights protection than other firms. The effect of the anti-corruption campaign on future audit fees should be more pronounced for firms that operate in the provinces mentioned above.

[10] One limitation of our study is that we have observed some covariate imbalances after PSM, which may be due to the inclusion of excessive control variables in the matching process. We recognize this as a potential issue and conduct the following untabulated robustness tests. First, we match firms based on the propensity scores generated by the probit model using the unbalanced covariates in Panels B and C of Appendix B. Second, we repeat the DID-PSM analysis by removing corporate governance variables (*Big Four*, *SOE*, *Institution Share*, *Foreign Share*, *Ln Analyst*, *Ln Board*, *Independence*, and *Political Connection* from the probit model. Although these alternative approaches may have their own limitations, our primary DID results remain robust to these matching criteria.

Table 4
Corruption and Future Audit Fees: Alternative DID Specifications.

		Ln Audit Fee$_{t+1}$					
		(1) *Treat*		**(2) *Treat × Post***			
		Coef.	**t-stat.**	**Coef.**	**t-stat.**	**N**	**Adj R^2**
Panel A: Alternative Samples							
(1)	Balanced sample without missing variables	0.056***	5.55	−0.050***	−4.01	5,396	0.854
(2)	6-year DID window	0.045***	6.54	−0.049***	−5.93	11,067	0.866
(3)	8-year DID window	0.041***	6.58	−0.047***	−6.32	13,995	0.875
Panel B: Alternative Treatment Assignment							
(4)	Quintile bin 2012 ETCs	0.025***	7.55	−0.023***	−6.34	7,610	0.863
(5)	Binary assignment based on 2011–2012 average corruption	0.047***	5.74	−0.046***	−4.58	7,741	0.862
Panel C: Alternative DID Model							
(6)	Replace *Treat*, *Post*, and industry and location fixed effects with firm and year fixed effects			−0.023*	−1.76	7,741	0.909
Panel D: PSM Approach							
(7)	Propensity scores matched control firms with replacement (unbalanced sample)	0.050***	3.79	−0.049***	−2.77	4,474	0.880
(8)	Propensity scores matched control firms with replacement (balanced sample)	0.056***	3.41	−0.094***	−3.64	3,408	0.865

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.
This table reports robustness checks of the relationship between corruption and future audit fees, using DID specifications. Panel A presents alternative sample specifications. Panel B shows results using alternative criteria for treatment assignment. Panel C uses a revised DID model that includes firm and year fixed effects. Panel D presents DID results using propensity-score-matched control groups. T-values are based on robust standard errors clustered by firm. See Appendix A for variable definitions.

We collect provincial scores regarding legal environments, government control, and property rights protection from the *National Economic Research Institute (NERI) Index of Marketization of China's Provinces* developed by Wang et al. (2019). The NERI index is a comprehensive index that measures the extent to which markets are able to operate freely in China. The NERI index has been widely accepted in accounting literature to measure local legal environments, such as Hung et al. (2012) and Hope et al. (2020).

- The degree of provincial legal environments in the NERI index refers to the quality of the legal framework and the efficiency of the judicial system, which is an important factor in promoting marketization and economic development. This is measured by a set of metrics such as regulatory quality, juridical efficiency, contract enforcement, and transparency of regulations. A higher score in the NERI index indicates a better legal environment. Thus, the *X* variable in column (1) of Table 5 is a dummy variable summary, defined as 1 if the legal environment score in 2012 is below the industry median and 0 otherwise.
- The degree of government intervention refers to the extent to which a provincial government influences local economic activities. This is measured by several sub-metrics, such as the degree of government–market relationship, government intervention in allocating resources, local tax alleviations, the reduction in government influences over corporate activities, and the downsizing of the government scale. A higher score indicates less government intervention and higher marketization. The *X* variable in column (2) indicates strong government control, which is defined as 1 if a province's government intervention scores in 2012 are below the industry median and 0 otherwise.
- The degree of property rights protection refers to the extent to which the ownership and use of property are legally recognized and protected. This is measured by several sub-metrics, such as producer rights protection scores, consumer rights protection scores, and intellectual property rights protection scores. A higher score on this index implies better property rights protection. The *X* dummy variable in column (3) indicates weak property rights protection, defined as 1 if the property rights protection scores in 2012 are below the industry median and 0 otherwise.

Table 5 reports the triple difference results. In all columns, the significantly positive coefficients on *Treat* show that corrupt firms in provinces with relatively good environments have higher future audit fees than normal firms in these provinces before the anti-corruption campaign. The significant and positive coefficients on *Treat* × *X* suggest audit fees are higher for corrupt firms exposed to weak legal environments, strong government control, and weak property rights protection than corrupt firms in relatively less corrupt environments.

The negative coefficients on *Treat* × *Post* are weakly significant at the 10% level, except for column (2), when government control is the moderator variable. The results imply that after the anti-corruption campaign, corrupt firms experience a decrease in future audit fees relative to normal firms in provinces with relatively good legal environments.

Most importantly, the coefficients on *Treat* × *Post* × *X* are significantly negative at the 1% or 5% levels. The results imply that the reduction in future audit fees is more pronounced for corrupt firms in provinces with weak legal environments, strong government control, and weak property rights protection than other firms after the anti-corruption campaign.

Table 5
Cross-Sectional Heterogeneity: Triple Difference Specifications.

	Ln Audit Fee$_{t+1}$					
	(1) **X = Weak Legal Environments**		**(2)** **X = Strong Government Control**		**(3)** **X = Weak Property Rights Protection**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Treat	0.030***	(2.86)	0.026**	(2.46)	0.029***	(2.71)
Treat × X	0.042***	(2.79)	0.051***	(3.40)	0.046***	(3.02)
Treat × Post	−0.025*	(−1.86)	−0.018	(−1.38)	−0.025*	(−1.83)
Treat × Post × X	−0.046**	(−2.27)	−0.059***	(−2.90)	−0.048**	(−2.34)
Post × X	0.007	(0.46)	0.012	(0.80)	0.002	(0.13)
X	−0.000	(−0.03)	−0.019	(−1.02)	0.005	(0.33)
Post	0.000	(0.01)	−0.002	(−0.22)	0.002	(0.23)
Ln Audit Fee	0.786***	(43.73)	0.786***	(43.70)	0.786***	(43.79)
Ln S&A	0.005*	(1.67)	0.005*	(1.65)	0.005*	(1.70)
Ln Asset	0.058***	(6.96)	0.058***	(6.99)	0.058***	(6.95)
Ln Sale	0.013***	(2.81)	0.013***	(2.80)	0.013***	(2.80)
Ln AR	0.003	(1.57)	0.003	(1.58)	0.003	(1.62)
Ln Inventory	−0.002	(−1.00)	−0.002	(−0.99)	−0.002	(−1.01)
Unqualified Opinion	−0.019	(−1.05)	−0.019	(−1.03)	−0.019	(−1.05)
Issuing Year	0.023**	(2.36)	0.022**	(2.32)	0.023**	(2.37)
ABSDA	0.098*	(1.92)	0.098*	(1.93)	0.097*	(1.91)
MTB	0.003***	(3.32)	0.003***	(3.30)	0.003***	(3.32)
Leverage	0.003	(1.02)	0.003	(1.00)	0.003	(1.04)
BHR	0.014	(1.61)	0.014*	(1.66)	0.014	(1.60)
ROA	−0.031	(−0.38)	−0.029	(−0.35)	−0.029	(−0.35)
SD ROA	0.247**	(2.43)	0.247**	(2.43)	0.246**	(2.42)
Loss	−0.006	(−0.51)	−0.006	(−0.44)	−0.006	(−0.48)
Big Four	0.092***	(4.91)	0.092***	(4.88)	0.093***	(4.94)
SOE	−0.010	(−1.42)	−0.009	(−1.36)	−0.010	(−1.44)
Institution Share	−0.033**	(−2.38)	−0.033**	(−2.44)	−0.032**	(−2.37)
Foreign Share	0.152***	(3.18)	0.149***	(3.13)	0.152***	(3.19)
Ln Analyst	−0.004	(−1.48)	−0.004	(−1.45)	−0.004	(−1.49)
Ln Board	−0.011	(−0.71)	−0.013	(−0.80)	−0.011	(−0.69)
Independence	0.092*	(1.67)	0.085	(1.55)	0.089	(1.63)
Political Connection	0.009	(0.36)	0.008	(0.29)	0.009	(0.33)
Constant	1.337***	(10.05)	1.346***	(9.95)	1.343***	(10.09)
Observations	7,741		7,741		7,741	
Adj R^2	0.863		0.863		0.863	
Industry FE	Y		Y		Y	
Location FE	Y		Y		Y	

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.
This table reports the tests of cross-sectional heterogeneity, using triple difference specifications. T-values are based on robust standard errors clustered by firm. See Appendix A for variable definitions.

In summary, the cross-sectional analyses show weak legal environments, strong government control, and weak property rights protection exacerbate the positive impact of corporate corruption on future audit fees.

Economic channels

We use structural models to explore economic channels through which the 2012 anti-corruption campaign reduces future audit fees.[11] The first channel we consider is government subsidies. Fang et al. (2022) show that managers use ETCs to develop relationships with local politicians to obtain corrupt benefits, such as more government subsidies. Accounting studies document that government subsidies are also one of the primary earnings tools in China (Chen et al., 2008; Lee et al., 2014). Local governments inflate listed firms' earnings by granting more subsidies to help them avoid delisting and meet regulatory thresholds for rights issuing and seasoned equity offerings (Chen et al., 2008). High earnings management levels and strong political connections erode a firm's reporting transparency (Hope et al., 2020), thus increasing audit costs.

However, the anti-corruption campaign has significantly escalated the political risks for both bribe-payers and bribe-takers. The heightened political risks should attenuate managerial incentives to bribe government officials through ETCs and local politicians' incentives to prop up corrupt firms' performance by granting more government subsidies. Drawing upon the above considerations, we argue the reduction in future audit fees for corrupt firms partially stems from the decrease in government subsidies received after the campaign.

[11] Gow et al. (2016) argue that structural models offer a variety of benefits for accounting researchers to improve causal inferences.

The second channel is related party transactions. Although related party transactions in China can be legitimate to some extent, academic research commonly views such transactions as the tip of the iceberg of serious governance problems. Cheung et al. (2006) show that a parent firm can undertake related party transactions to expropriate minority shareholders' interests (known as the tunneling hypothesis). Conversely, Jian and Wong (2010) find related party transactions, such as sales (or purchases) of goods and assets to the parent firm above (below) the fair value, can also be used to inflate listed firms' earnings (known as the propping-up hypothesis). Both tunneling and propping-up hypotheses suggest related party transactions represent conflicts of interest between controlling shareholders and minority shareholders and weaken disclosure transparency.

Hu et al. (2020) find that the anti-corruption campaign enhances corporate governance, particularly in an environment of limited transparency. Therefore, the 2012 campaign should decrease related party transactions by reducing corruption and improving corporate governance mechanisms. Corrupt firms with high related party transactions should receive more regulatory scrutiny in the post-campaign period. The evidence of Habib et al. (2015) confirms that firms with high levels of related party transactions pay an audit premium. Thus, we hypothesize that related party transactions are channels through which corporate corruption affects future audit fees. We estimate Eqs. (4) and (5) to test our hypotheses.

$$LnSubsidy_{t+1} or LnRPT_{t+1} = \beta_0 + \beta_1 Treat_t + \beta_2 Treat_t \times Post_t + \beta_3 Post_t + \gamma\prime Controls_t + IndustryandLocationFE + \varepsilon_t \tag{4}$$

$$LnAuditFee_{t+1} = \beta_0 + \beta_1 Treat_t + \beta_2 Treat_t \times Post_t + \beta_3 Post_t + \beta_4 LnSubsidy_{t+1} or LnRPT_{t+1} + \gamma\prime Controls_t + IndustryandLocationFE + \varepsilon_t \tag{5}$$

where $Ln\ Subsidy_{t+1}$ is the natural logarithm of government subsidies in year $t + 1$. $Ln\ RPT_{t+1}$ is the natural logarithm of related party sales and purchases of goods, services, assets, and loans in year $t + 1$. We include the same set of control variables used in the main analysis, along with industry and location fixed effects.

Table 6 shows the results of mediation analyses. In column (1), the coefficient on *Treat* is significantly positive at the 1% level, confirming that corrupt firms receive more subsidies than others before the campaign. The coefficient on *Treat* × *Post* is significantly negative at the 5% level, showing that corrupt firms receive fewer subsidies after the campaign than normal firms. A positive coefficient on *Post* suggests normal firms receive more government subsidies after the campaign. This result is consistent with Fang et al. (2022), suggesting the campaign has improved the resource allocation efficiency and local governments prefer allocating more subsidies to normal firms after the anti-corruption campaign. Column (2) shows a negative coefficient on *Treat* × *Post*, suggesting corrupt firms engage in lower amounts of related party transactions than normal firms after the campaign.

Column (3) includes mediation variables, $Ln\ Subsidy_{t+1}$ and $Ln\ RPT_{t+1}$ as additional control variables. The coefficients on $Ln\ Subsidy_{t+1}$ and $Ln\ RPT_{t+1}$ are significantly positive, implying government subsidies and related party transactions are channels affecting future audit fees. When compared to the results in column (1) of Panel B in Table 3, the absolute magnitude of the negative coefficient on *Treat* × *Post* decreases from 0.047 to 0.044. The result shows that the indirect effects through the above two channels account for 6.4% of the total effect of reduced corruption on future audit fees after the campaign.

In summary, the above mediation analyses show that government subsidies and related party transactions are channels through which corporate corruption affects future audit fees. The anti-corruption campaign has significantly reduced corrupt firms' access to political favors and related party transactions, resulting in lower future audit fees.

Additional analyses

First- and long-differencing models

In addition to the quasi-experimental approach in the previous section, first- and long-difference regressions can also effectively alleviate the endogeneity problem, which is widely adopted in academic studies. In Panel A of Table 7, we compute changes in $Ln\ Audit\ Fee_{t+1}$, *Ln Corruption*, and other control variables over an annual, three-year, and five-year window in columns (1)–(3). The coefficients on $\Delta Ln\ Corruption$ are significantly positive in all columns, suggesting changes in corporate corruption through ETCs are correlated with changes in future audit fees. These results strengthen the causal effects of corporate corruption on future audit fees.

Heckman correction

We employ Heckman (1979) two-stage regressions to correct the sample section bias stemming from missing ETCs, which account for 19% of firm-year observations. Following Hu et al. (2020), we use the natural logarithm of geographical distance between a firm's headquarters and the central government in Beijing (*Distance*) as the identifying instrument. Hu et al. (2020) find when a firm is farther from the central government in Beijing, its managers are more willing to report ETCs due to lower political risks. A firm's geographical distance from Beijing is less likely to affect firm-specific audit charges directly.

Column (1) in Panel B of Table 7 reports the first-stage probit regression result. The dependent variable, *Disclosure*, is a dummy variable equaling 1 if a firm discloses ETCs in its annual report and 0 otherwise. We include the same set of control

Table 6
Economic Channels: Structural Equation Modeling.

	Ln Subsidy$_{t+1}$		*Ln RPT$_{t+1}$*		*Ln Audit Fee$_{t+1}$*	
	(1)		**(3)**		**(4)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Treat	0.609***	(4.15)	−0.127	(−0.37)	0.049***	(5.79)
Treat × Post	−0.265**	(−2.21)	−0.635**	(−2.22)	−0.045***	(−4.42)
Post	0.345***	(3.01)	0.252	(1.06)	0.002	(0.26)
Ln Audit Fee	−0.186	(−1.32)	0.506*	(1.67)	0.785***	(43.65)
Ln S&A	0.153**	(2.48)	−0.224***	(−2.67)	0.005	(1.63)
Ln Asset	0.227*	(1.73)	1.283***	(4.75)	0.056***	(6.68)
Ln Sale	0.440***	(3.91)	0.933***	(4.40)	0.011**	(2.26)
Ln AR	0.317***	(7.20)	0.154**	(2.38)	0.002	(0.91)
Ln Inventory	−0.015	(−0.44)	0.067	(1.12)	−0.002	(−1.07)
Unqualified Opinion	0.615	(1.59)	−0.615	(−1.21)	−0.019	(−1.02)
Issuing Year	−0.097	(−1.03)	0.894***	(3.58)	0.021**	(2.19)
ABSDA	−1.363*	(−1.94)	5.938***	(3.94)	0.095*	(1.87)
MTB	−0.075***	(−3.66)	0.139***	(5.07)	0.003***	(3.26)
Leverage	−0.204***	(−4.35)	0.459*	(1.72)	0.003	(1.07)
BHR	0.154**	(2.02)	0.038	(0.20)	0.014*	(1.65)
ROA	−3.149**	(−2.51)	−19.659***	(−6.82)	0.011	(0.14)
SD ROA	0.150	(0.09)	−3.707	(−1.01)	0.252**	(2.46)
Loss	0.041	(0.22)	−0.395	(−1.06)	−0.006	(−0.49)
Big Four	−0.140	(−0.39)	−1.197*	(−1.76)	0.094***	(5.00)
SOE	0.100	(0.71)	2.258***	(7.47)	−0.013*	(−1.92)
Institution Share	−0.366*	(−1.77)	5.088***	(8.70)	−0.041***	(−3.01)
Foreign Share	−0.896	(−0.74)	−3.586	(−1.44)	0.156***	(3.24)
Ln Analyst	0.249***	(5.38)	−0.810***	(−6.29)	−0.003	(−1.17)
Ln Board	0.091	(0.28)	−1.677**	(−2.37)	−0.009	(−0.56)
Independence	0.753	(0.80)	−7.284***	(−2.99)	0.098*	(1.80)
Political Connection	0.997**	(2.31)	1.102	(1.07)	0.003	(0.12)
Ln Subsidy$_{t+1}$					0.003**	(2.51)
Ln RPT$_{t+1}$					0.002***	(4.64)
Constant	−4.796***	(−2.58)	−35.623***	(−9.57)	1.403***	(10.38)
Observations	7,741		7,741		7,741	
Adj R^2	0.350		0.274		0.863	
Industry FE	Y		Y		Y	
Location FE	Y		Y		Y	

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.
This table reports economic channels underlying the relationship between corruption and future audit fees. T-values are based on robust standard errors clustered by firm. See Appendix A for variable definitions.

variables used in column (3) of Table 2. We also include industry, location, and year fixed effects, consistent with Hu et al. (2020). We find a positive and significant coefficient on *Distance*, indicating that firms with further distance to Beijing are more likely to disclose ETCs. We include the inverse Mills ratio (IMR) in the second-stage regression. Column (2) shows the coefficient on *Ln Corruption* remains significantly positive, indicating our results are robust after adjusting for potential selection bias.

Alternative corruption proxies

In this section, we consider several alternative corruption proxies. Jha et al. (2020) use the number of officials' corruption convictions at the U.S. judicial region scaled by regional population as the proxy for local corruption environments. Similarly, we measure local corruption environments (*Corrupt Environment*) by scaling the number of corruption convictions at the province level by provincial population in year *t*, multiplied by 1,000 to suppress the coefficients.

Panel A of Table 8 presents our findings on the impact of the local corruption environment on future audit fees. Column (1) indicates that the effect of local corruption environments on audit fees is significantly positive when *not* controlling for current audit fees. However, the statistical significance disappears in column (2) when we use a dynamic model, which accounts for the persistence and dynamics of audit fees, as suggested by Kacer et al. (2018).[12] This result implies the relationship between local corruption environments and audit fees may not pass more rigorous tests. However, the effect of *Ln Corruption* remains positively significant even after controlling for local corruption environments.

[12] Kacer et al. (2018) highlight the significance of considering the lagged impacts of audit fees. This is because audit fees exhibit high persistence, and prediction models for future audit fees are more effective when they account for current audit fees. Thus, controlling for current audit fees can enhance the explanatory power of the prediction models for future audit fees.

Table 7
Additional Identification Strategies.

Panel A: First- and Long-Differencing Models

	Δ*Ln Audit Fee*$_{t+1}$					
	(1) **1-year**		**(2)** **3-year**		**(3)** **5-year**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Δ*Ln Corruption*	0.014***	(3.06)	0.019***	(3.30)	0.015*	(1.92)
Observations	13,059		8,600		4,682	
Adj R^2	0.060		0.433		0.692	
ΔControls	Y		Y		Y	
Firm FE	Y		Y		Y	
Year FE	Y		Y		Y	

Panel B: Heckman Correction

	Disclosure$_t$		*Ln Audit Fee*$_{t+1}$	
	(1)		**(2)**	
	Coef.	***z*-stat.**	**Coef.**	***t*-stat.**
Ln Corruption			0.025***	(4.71)
IMR			0.016	(0.23)
Distance	0.047***	(2.80)		
Observations	19,788		16,575	
Pseudo/Adj R^2	0.190		0.903	
Controls	Y		Y	
Industry FE	Y		N	
Location FE	Y		N	
Firm FE	N		Y	
Year FE	Y		Y	

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.
This table reports additional identification tests of the relationship between corruption and future audit fees. Panel A presents results using first- and long-differencing models. Panel B reports results using Heckman two-stage regressions. T-values are based on robust standard errors clustered by firm. Z-values are reported if a probit model is used. See Appendix A for variable definitions.

Our second measure of local corruption environments, *Corrupt City*, aligns with Chen et al. (2020) and is based on the arrest of a city principal to measure corruption at the city level. We create a binary variable, *Corrupt City*, which is set to 1 if the observation falls within three years before a city principal is apprehended for corruption and 0 otherwise. Our data are manually collected from the *Procuratorial Yearbook of China*.

Panel B shows the effect of *Corrupt City* is significant only in column (1) when current audit fees, *Ln Audit Fee*, are not included in the prediction model but turn out to be insignificant in column (2). The positive effects of *Ln Corruption* on future audit fees continue to be significant in column (3) after adding *Corrupt City* as a dummy variable. These results suggest local corruption environments have relatively weak explanatory power for audit fees. Auditors in China incorporate firm-level corrupt spending, rather than local corruption environments, into their audit charges.

Finally, Cai et al. (2011) suggest that ETCs also contain normal business expenses managers use to develop relationships with stakeholders. To control for systematic variations in ETCs, we borrow from Roychowdhury (2006) by expressing legitimate ETCs as a function of sales revenue. We estimate Eq. (6) within each industry and year.

$$LnCorruption_t = \beta_0 + \beta_1 LnSale_t + \varepsilon_t \tag{6}$$

Our second measure of *Abnormal Ln Corruption* is similar to Cai et al. (2011). We regress *Ln Corruption* on the control variables used in column (3) of Table 2. The model is presented in Eq. (7).

$$LnCorruption_t = \beta_0 + \gamma' Control_t + FirmFE + YearFE + \varepsilon_t \tag{7}$$

The residual terms generated by Eqs. (6) and (7) are *Abnormal Ln Corruption*. The positive and significant coefficients on *AB Ln Corruption* in Panel C of Table 8 suggest the relationship between corporate corruption and future audit fees is robust to abnormal corruption measures.

Conclusion

This study finds firm-level corruption positively affects future audit fees. Using China's anti-corruption campaign as a quasi-natural experiment, we find an exogenous reduction in firm-level corruption results in lower future audit fees. In addition, the effect of corruption reduction on future audit fees is more pronounced for firms in provinces with weak legal environments, strong government control, and weak property rights protection. We identify government subsidies and related party transactions as underlying economic channels through which corporate corruption heightens future audit fees. Our

Table 8
Alternative Corruption Measures.

Panel A: Corrupt Environments

	Ln Audit Fee$_{t+1}$					
	(1)		**(2)**		**(3)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Corrupt Environment	0.971***	(3.01)	0.132	(0.65)	0.133	(0.66)
Ln Audit Fee			0.836***	(81.26)	0.832***	(79.73)
Ln Corruption					0.010***	(5.44)
Observations	16,575		16,575		16,575	
Adj R^2	0.667		0.883		0.883	
Controls	Y		Y		Y	
Industry FE	Y		Y		Y	
Location FE	Y		Y		Y	
Year FE	Y		Y		Y	

Panel B: Corrupt City

	Ln Audit Fee$_{t+1}$					
	(1)		**(2)**		**(3)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**	**Coef.**	***t*-stat.**
Corrupt City	0.087***	(4.09)	−0.001	(−0.17)	−0.005	(−0.78)
Ln Audit Fee			0.836***	(249.24)	0.833***	(17.62)
Ln Corruption					0.010***	(4.71)
Observations	16,575		16,575		16,575	
Adj R^2	0.667		0.883		0.883	
Controls	Y		Y		Y	
Industry FE	Y		Y		Y	
Location FE	Y		Y		Y	
Year FE	Y		Y		Y	

Panel C: Alternative Corruption Measures

	Ln Audit Fee$_{t+1}$			
	(1)		**(2)**	
	Coef.	***t*-stat.**	**Coef.**	***t*-stat.**
AB Ln Corruption	0.017***	(3.20)	0.025***	(4.71)
Observations	16,575		16,575	
Adj R^2	0.903		0.903	
Controls	Y		Y	
Firm FE	Y		Y	
Year FE	Y		Y	

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.
This table reports results using abnormal corruption measures as independent variables. Panel A reports results using *Corrupt Environment* as an alternative corruption measure. Panel B reports results using *Corrupt City* as an alternative corruption measure. Panel C reports results using *AB Ln Corruption* as the independent variable. T-values are based on robust standard errors clustered by firm. See Appendix A for variable definitions.

findings are supported by first- and long-differencing models and a Heckman approach, adding more credence to the causal relationship between corruption and audit fees being robust.

In summary, our findings are consistent with the notion that corruption increases audit complexity and effort. Our study contributes to the broad literature examining the consequences of corruption and the economic determinants of audit fees. In particular, our study extends previous research by concluding that the effect of corruption on audit fees is causal. Finally, by showing that the anti-corruption campaign lowers audit fees, our results should be of interest to regulators who seek to understand the benefits of the anti-corruption campaign.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Variable definitions

Variables	Description
Ln Audit Fee	Natural logarithm of audit fees.
Ln Corruption	Natural logarithm of business entertainment and travel costs.
Ln S&A	Natural logarithm of selling and general administrative costs excluding business entertainment and travel costs.
Ln Asset	Natural logarithm of total assets.
Ln Sale	Natural logarithm of sales revenue.
Ln AR	Natural logarithm of accounts receivables.
Ln Inventory	Natural logarithm of inventory.
Unqualified Opinion	Dummy variable equaling 1 if an unqualified opinion is issued and 0 otherwise.
Issuing Year	Dummy variable equaling 1 if a firm issues rights offerings, public offerings, or private placement and 0 otherwise.
ABSDA	Absolute value of discretionary accruals using the modified Jones model.
MTB	Market-to-book ratio.
Leverage	Financial leverage, calculated as total liabilities divided by total assets.
BHR	Buy and hold returns.
ROA	Return on assets, calculated as net profit divided by total assets.
SD ROA	Standard deviation of return on assets over a 5-year rolling window.
Loss	Dummy variable equaling 1 if net profit is negative and 0 otherwise.
Big Four	Dummy variable equaling 1 if the firm uses a big-four auditor and 0 otherwise.
SOE	Dummy variable equaling 1 if the ultimate owner is the government and 0 otherwise.
Institution Share	Percentage of shares held by financial Institution shares relative to total number of shares.
Foreign Share	Percentage of shares held by foreign investors relative to total number of shares.
Ln Analyst	Natural logarithm of 1 plus number of analyst forecasts issued for the firm.
Ln Board	Natural logarithm of 1 plus number of board directors.
Independence	Ratio of independent directors to total number of directors.
Political Connection	Percentage of directors having political connections relative to total number of directors.
Treat	Dummy variable equaling 1 if a firm's *Ln Corruption* in 2012 is above its industry median and 0 otherwise.
Post	Dummy variable equaling 1 if the observation is in the post-campaign period (years after 2012) and 0 otherwise.
Ln Subsidy	Natural logarithm of government subsidies. Missing values are set to zero.
Ln RPT	Natural logarithm of related party sales and purchases of goods, services, assets, and loans. Missing values are set to zero.
Disclosure	Dummy variable equaling 1 if a firm reports business entertainment and travel costs in annual reports and 0 otherwise.
Distance	Natural logarithm of the geographical distance between a firm's headquarters and the central government in Beijing.
IMR	Inverse Mills ratio.
Corrupt Environment	Number of corruption convictions at the province level divided by provincial population, multiplied by 1,000.
Corrupt City	Dummy variable equaling 1 if the observation is in the three-year period before a city principal is arrested and 0 otherwise.
Firm FE	Firm fixed effect dummies.
Industry FE	Industry fixed effect dummies.
Province FE	Province fixed effect dummies.
Year FE	Year fixed effect dummies.

Appendix B. Propensity score matching

Panel A: Propensity of Being Treated

	Unbalanced Sample		Balance Sample	
	Coef.	***z*-stat.**	**Coef.**	***z*-stat.**
Ln Audit Fee	0.208**	(2.13)	0.343***	(2.82)
Ln S&A	0.179***	(5.81)	0.114***	(3.29)
Ln Asset	0.251***	(3.24)	0.340***	(3.50)
Ln Sale	0.148**	(2.36)	0.107	(1.37)
Ln AR	0.178***	(7.30)	0.159***	(5.47)
Ln Inventory	0.011	(0.69)	0.026	(1.13)
Unqualified Opinion	0.379	(1.54)	0.072	(0.22)
Issuing Year	0.016	(0.12)	0.042	(0.24)
ABSDA	−0.527	(−0.85)	0.211	(0.26)
MTB	0.026*	(1.72)	0.013	(0.60)
Leverage	0.282**	(2.02)	0.371	(1.09)
BHR	−0.138	(−1.02)	−0.345**	(−2.00)
ROA	3.013***	(2.84)	3.549***	(2.63)
SD ROA	−0.025	(−0.02)	−0.853	(−0.66)
Loss	0.094	(0.62)	0.076	(0.41)
Big Four	0.127	(0.53)	0.095	(0.34)
SOE	−0.047	(−0.54)	0.040	(0.39)
Institution Share	−0.192	(−1.08)	−0.428*	(−1.92)
Foreign Share	−0.864	(−1.32)	−1.285*	(−1.71)
Ln Analyst	0.075*	(1.95)	0.104**	(2.10)
Ln Board	0.402*	(1.87)	0.245	(0.94)
Independence	−0.223	(−0.30)	−0.148	(−0.16)
Political Connection	−0.215	(−0.69)	−0.531	(−1.33)
Constant	−19.173***	(−14.25)	−20.272***	(−11.57)
Observations	1,993		1,349	
Pseudo R^2	0.309		0.330	
Industry FE	Y		Y	
Province FE	Y		Y	

Panel B: Covariate Balance Check – Unbalanced Sample

	Before Matching					After Matching			
	Treat	**Control**	**Diff**	***t*-stat.**		**Control**	**Diff**	***t*-stat.**	
Ln Audit Fee	13.75	13.24	0.51	18.61	***	13.48	0.27	1.35	
Ln S&A	19.59	18.30	1.29	22.81	***	19.43	0.17	2.85	***
Ln Asset	22.34	21.22	1.12	22.98	***	22.34	0.00	−0.07	
Ln Sale	21.81	20.42	1.39	24.29	***	21.88	−0.07	−1.14	
Ln AR	19.55	17.97	1.58	16.30	***	19.43	0.12	1.68	*
Ln Inventory	19.98	18.50	1.49	11.98	***	19.99	−0.01	−0.09	
Unqualified Opinion	0.99	0.95	0.04	4.76	***	0.99	−0.00	−0.20	
Issuing Year	0.09	0.05	0.04	3.58	***	0.05	0.03	2.27	**
ABSDA	0.06	0.06	−0.01	−1.96	*	0.05	0.00	1.47	
MTB	3.54	3.58	−0.04	−0.32		3.37	0.17	1.60	
Leverage	0.48	0.41	0.07	3.85	***	0.43	0.05	1.34	
BHR	0.02	0.03	−0.01	−0.87		0.04	−0.02	−1.85	
ROA	0.04	0.03	0.01	4.18	***	0.05	−0.01	−2.47	**
SD ROA	0.03	0.04	−0.01	−4.51	***	0.03	0.00	−1.25	
Loss	0.09	0.11	−0.02	−1.59		0.07	0.02	1.30	
Big Four	0.07	0.01	0.06	6.50	***	0.12	−0.05	−3.73	***
SOE	0.47	0.33	0.14	6.35	***	0.44	0.03	1.06	
Institution Share	0.42	0.32	0.10	9.79	***	0.43	−0.01	−0.70	

(*continued on next page*)

Propensity score matching (*continued*)

Panel B: Covariate Balance Check – Unbalanced Sample

	Before Matching					After Matching			
	Treat	Control	Diff	*t*-stat.		Control	Diff	*t*-stat.	
Foreign Share	0.02	0.01	0.01	3.09	***	0.01	0.01	2.11	**
Ln Analyst	1.89	1.22	0.67	13.23	***	1.94	−0.04	−0.88	
Ln Board	2.20	2.13	0.07	8.67	***	2.20	0.00	0.42	
Independence	0.37	0.37	0.00	−0.99		0.36	0.01	1.48	
Political Connection	0.10	0.09	0.01	1.44		0.10	−0.01	−1.22	

Panel C: Covariate Balance Check – Balanced Sample

	Before Matching					After Matching			
	Treat	Control	Diff	*t*-stat.		Control	Diff	*t*-stat.	
Ln Audit Fee	13.79	13.29	0.50	15.06	***	13.74	0.05	1.54	
Ln S&A	19.67	18.42	1.25	16.57	***	19.50	0.16	2.28	**
Ln Asset	22.47	21.35	1.12	18.76	***	22.44	0.03	0.45	
Ln Sale	21.94	20.58	1.36	19.62	***	21.97	−0.03	−0.42	
Ln AR	19.60	17.95	1.65	14.04	***	19.41	0.18	2.09	**
Ln Inventory	20.15	18.69	1.46	10.18	***	20.11	0.04	0.40	
Unqualified Opinion	0.99	0.95	0.03	3.78	***	0.98	0.01	1.23	
Issuing Year	0.09	0.05	0.04	2.99	***	0.10	−0.01	−0.61	
ABSDA	0.06	0.06	0.00	−1.54		0.05	0.00	0.14	
MTB	3.59	3.98	−0.39	−2.43	**	3.48	0.11	1.05	
Leverage	0.50	0.44	0.05	3.08	***	0.49	0.01	0.63	
BHR	0.01	0.04	−0.03	−1.86	*	0.04	−0.03	−2.22	**
ROA	0.04	0.03	0.01	4.46	***	0.05	0.00	−1.40	
SD ROA	0.03	0.04	−0.01	−4.51	***	0.03	0.00	−1.16	
Loss	0.09	0.13	−0.04	−2.09	**	0.12	−0.03	−1.61	
Big Four	0.08	0.02	0.06	5.09	***	0.11	−0.03	−2.24	
SOE	0.54	0.43	0.11	3.95	***	0.50	0.04	1.46	
Institution Share	0.44	0.37	0.07	5.91	***	0.45	−0.01	−0.75	
Foreign Share	0.02	0.01	0.00	1.31		0.02	0.00	0.20	
Ln Analyst	1.84	1.11	0.73	11.82	***	1.97	−0.13	−2.22	**
Ln Board	2.21	2.14	0.07	6.56	***	2.22	−0.01	−1.01	
Independence	0.37	0.37	0.00	−0.46		0.37	0.00	1.41	
Political Connection	0.09	0.09	0.00	0.54		0.09	0.00	0.09	

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels (two-tailed), respectively.

Panel A presents the estimation results of the probit model using unbalanced and balanced samples, respectively. Panel B reports the covariate balance check using an unbalanced sample. Panel C reports the covariate balance check using a balanced sample.

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