Litigation Risk, Reputation Protection, and Audit Quality

Chengjie Dong [1], Hualin Jiang [2], Yan Tan [3], Zhemin Wang [4]*

1. *Guangzhou Nanfang College*
2. *Guangdong University of Finance*
3. *Sun Yat-sen University*
4. *University of Wisconsin-Parkside*

A B S T R A C T

Litigation risk and reputation protection are often cited in the literature as incentives for high quality audit services. This study examines whether reputation protection can motivate Big 4 auditors to provide higher quality audits in a low litigation risk audit market. We measure audit quality using accounting related enforcement actions against clients by securities regulators. Based on 7,011 firm-year observations of non-state-owned listed companies in China for the period of 2007 to 2015, we find no significant differences in either the frequency or severity of accounting related enforcement actions between Big 4 and non-Big 4 clients. Our findings indicate that reputational concerns alone cannot motivate Big 4 auditors to provide superior quality audit services in China's low litigation risk audit market. Given the large number of low litigation risk jurisdictions across the world, our findings highlight the importance of legal reforms for improving audit quality.

---

* Mail: wangz@uwp.edu

1. Introduction

This study examines whether reputational concerns can motivate auditors to provide high quality audits in China's low litigation risk audit market.

Litigation risk avoidance and reputation protection are often cited in the literature as incentives for Big 4 auditors to provide higher quality audit services. Based on the evidence from the U.S. audit market, where Big 4 auditors face both high litigation risks and strong reputation protection incentives, the literature generally concludes that Big 4 audit quality is higher than that of non-Big 4 auditors (for a summary of this research, see DeFond and Zhang 2014). While it is well documented that litigation risk affects audit quality, evidence of reputational effect on audit quality is rare and mixed (DeFond and Zhang 2014, Ke et al. 2015). It remains an open issue whether the reputation protection incentive can motivate Big 4 auditors to provide superior quality audit services in low litigation risk audit markets.

We choose China for our study because Big 4 auditors face low litigation risks, yet have strong reputation protection incentives in China's vast audit market. Enforcement of investor protection laws is generally weak in China, and it is rare for auditors to get sued (Allen et al. 2005). At the same time, Big 4 auditors have strong incentives to protect their reputation because of their large global client base and the great market potential in China, which has the world's second largest audit market. This combination of low litigation risk and strong reputation protection incentive provides an ideal setting for testing the reputational effect on audit quality. Additionally, our single-country setting avoids the potential confounding effect of institutional differences in cross-country studies.

We focus on non-state-owned listed companies in China because these companies have different characteristics from state-owned enterprises. Furthermore, contrary to the widespread ownership structure of listed companies in many Western countries, the ownership of non-state-owned listed companies in China is usually highly concentrated. The controlling shareholders of Chinese companies are often heavily involved in the companies' management. External auditors, therefore, play a critical role for the protection of small shareholders. Given that low litigation risk and high ownership concentration are common in many developing countries, the issue of whether reputational concerns alone can motivate Big 4 auditors to provide higher quality audit services should be of interest to both investors and securities regulators.

Since audit quality is not directly observable, a variety of proxies have been used for audit quality in the literature (Becker et al. 1998; Boone et al. 2010; Krishnan 2003; Behn et al. 2008; Lawrence et al. 2011; DeFond and Lennox 2011; Legoria et al. 2017; Habib et al. 2014; Li et al. 2008). We choose clients' accounting related enforcement actions (AREAs) as our proxy for audit quality because they indicate that auditors erroneously issued an unqualified opinion on materially misstated financial statements (DeFond and Zhang 2014). We didn't choose going concern opinions because they are limited to financially distressed firms. We didn't choose litigations against auditors, another commonly used audit quality proxy in the literature, because they are rare events in China's audit market. While accounting related enforcement actions provide direct and egregious evidence of audit quality, AREAs are also affected by clients' reporting incentives. Thus, we include control variables that were identified in the literature in our research design to mitigate the effect of clients' reporting incentives.

Based on 7,011 firm-year observations of China's non-state-owned listed companies for the period of 2007-2015, we find no significant differences in either the frequency or severity of accounting related enforcement actions between Big 4 and non-Big 4 clients after controlling for

clients' characteristics and reporting incentives. Our findings do not support the notion that reputational concerns can motivate Big 4 auditors to exert greater efforts in preventing and detecting clients' reporting irregularities.

We also test whether reputational concerns can motivate China's domestic Big 4 auditors to provide higher quality audit services. Given China's domestic Big 4 auditors' large market share of non-state-owned listed companies (31%), they should also have strong incentives to protect their reputation. Thus, tests using China's domestic Big 4 instead of the international Big 4 can provide additional insights regarding the reputational effect on audit quality. Our test results indicate no significant differences in either the frequency or severity of accounting related enforcement actions between China's domestic Big 4 clients and non-Big 4 clients. Taken together, our findings from international Big 4 and China's domestic Big 4 do not support the popular belief that reputational concerns can motivate Big 4 auditors to provide superior quality audit services in China's low litigation risk audit market. Our findings are consistent with Khuruna and Ruman (2004) who find that it is not brand name protection, but rather litigation exposure that drives audit quality in the US, Canada, Australia, and UK. The evidence is also consistent with Ke et al. (2015) who find Big 4 firms assign less experienced partners to clients listed in China compared to clients cross-listed in Hong Kong.

To ensure the robustness of our results, we include extensive controls for clients' reporting incentives and year and industry fixed-effect in our research design. In addition, we use both the propensity score matching (PSM) technique and Heckman's two-stage correction procedure to control for clients' characteristics and potential self-selection bias. We also use Petersen's two-way clustered analysis to correct for correlations across firms and over time in our panel data. Therefore, our results are unlikely to be driven by clients' reporting incentives, self-selection bias, or the correlation in our panel data.

We contribute to the continued debate in audit quality literature regarding the relative importance of litigation risk versus reputation protection in motivating auditors to provide higher quality audits. Our findings indicate that the reputation protection incentive alone cannot motivate Big 4 firms to provide superior quality audits in low litigation risk audit markets. The findings have direct policy implications for securities regulators in low litigation risk jurisdictions in that they highlight the importance of legal reforms for improving audit quality. In addition, our findings also have methodological implications and suggest that researchers should exercise caution when using the Big 4 versus non-Big 4 dichotomy as a proxy for audit quality in low litigation risk audit markets. Finally, our findings have practical ramifications in the selection of auditors by audit committees (CFA Institute Center 2009; Moizer 1997) and in loan and underwriting agreements (De Angelo 1981) in low litigation risk jurisdictions.

The remainder of the study is organized as follows. Section 2 reviews the literature and develops the empirical models. Section 3 describes sample selection procedures and the data. Section 4 presents empirical tests and results. The last section summarizes and concludes the paper.

2. Literature review and model development

2.1 Literature on motivations for high quality audits

Litigation risk and reputation protection are often cited in the literature as incentives for Big 4 firms to provide higher quality audit services (Knechel et al. 2007). Litigation damage claims against auditors can be large enough to threaten even the largest audit firm. In addition, Big 4's deep pockets make them the targets of plaintiff attorneys' class action lawsuits in high litigation risk audit market (e.g., in the U.S.). Therefore, litigation risk is expected to have a strong incentive

effect for Big 4 firms to increase their efforts which would increase audit quality (Caramanis and Lennox 2008; DeFond and Zhang 2014; Chen et al. 2010; Simunic 1980; Khuruna and Raman 2004).[†] Conversely, studies find that regulations that reduce litigation risks decrease audit quality (Monroe et al. 1992; DeFond and Zhang, 2014).

It is less clear whether reputation concerns can motivate Big 4 auditors to provide higher quality audits when litigation risk is low. While it seems intuitive that reputation risk provides an incentive for high quality audit services because of Big 4 firms' large client base, studies testing reputational effect are rare, and are inextricably confounded by litigation risk in the U.S. audit market. Several studies examine the reputational effect using low litigation risk jurisdictions to mitigate the confounding factor of litigation risk. For example, the study of a major audit failure in Germany by Weber, Willenborg, and Zhang (2008) finds KPMG, a Big 4 firm, lost clients after the incident. Skinner and Scrinivasan (2012) find another Big 4 firm, PwC, lost clients after a major audit failure in Japan. Since both Germany and Japan are low litigation risk jurisdictions, the authors attribute the loss of clients to reputational effect. While these studies provide some evidence on reputational effect, they rely on rare cases of extreme reputation loss. As such, while they provide evidence that extreme reputation loss can result in loss of clients, it is not clear whether reputation protection concerns can motivate Big 4 firms to provide higher quality audits (DeFond and Zhang, 2014). Thus, it remains unsettled whether reputational concerns can motivate Big 4 firms to provide higher quality audits in low litigation risk audit markets.

2.2 Literature on audit quality proxies

Numerous studies have examined the issue of audit quality of Big 4 versus non-Big 4 firms using a variety of audit quality proxies, such as going concern opinions, litigations against auditors, and discretionary accruals, among others (DeAngelo 1981; Dopuch and Simunic 1980; Khurana and Raman 2004; Behn et al. 2008; Francis and Yu 2009). While litigations against auditors have the advantage of providing strong evidence of poor audit quality, they are relatively rare events in China, which limits the statistical power of the tests. Auditor's going concern opinions have the advantage of providing evidence of audit quality with relatively low measurement error and of being under auditor's direct control. However, they are limited to financially distressed clients, and only capture a narrow aspect of the auditor's role (DeFond and Zhang 2014). We choose accounting related enforcement actions against clients as a proxy for audit quality based on the premise that if Big 4 auditors are more effective in preventing and detecting clients' financial reporting irregularities, Big 4 clients should be less likely to face accounting related enforcement actions, other things being equal. Audit standards require auditors to assess clients' fraud risk and to provide reasonable assurance that fraud does not result in material misstatement. Thus, accounting related enforcement actions provide direct and egregious evidence of audit quality because they indicate that auditors erroneously issued an unqualified opinion on materially misstated financial statements (DeFond and Zhang 2014).

2.3 Models of Empirical Tests

The primary objective of this study is to examine whether reputational concerns can motivate Big 4 auditors to provide higher quality audits in terms of preventing and detecting clients' reporting irregularities. Our first test is to compare the frequency of accounting related enforcement actions (AREAs) between Big 4 and non-Big 4 clients. If reputational concerns alone can motivate Big 4

[†] Alternatively, auditors may charge a fee premium to compensate for the increase risk (Bell et al. 2008; Seetharaman et al. 2002; Choi et al. 2008; Magnan 2008; DeGeorge et al. 2013) or avoid risky clients (Johnstone and Bedard 2004).

auditors to exert greater efforts in preventing and detecting financial reporting irregularities in China's low litigation environment, Big 4 clients should face AREAs less frequently than non-Big 4 clients. While high quality auditors are expected to reduce the occurrence of financial reporting irregularities, accounting quality is also affected by firm-level reporting incentives. Consequently, we use the following regression equation to assess the difference in the frequency of AREAs between Big 4 and non-Big 4 clients after controlling for firm-level characteristics that are known to affect reporting quality:

$$D\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon \quad (1)$$

Where D_AREA_t is a frequency indicator variable which equals one if the client is subject to accounting related enforcement actions in period t, and zero otherwise. Accounting related enforcement actions against firms by securities regulators include fictitious profits or assets, false records or misleading statements, delayed disclosure, major omissions, and improper accounting treatments. *Big4* is an indicator variable which equals one if the auditor is a Big 4 firm, and zero otherwise. The other variables in the equation attempt to control for firm-level differences in largest shareholder's percentage ownership (*Top1*), chairman of the board also serves as the CEO (*Dual*), board size (*LnDirector*), shareholding by management (*HLD_M*), operating cash flows (*Cash*), debt cost (*DC*), return on assets (*ROA*), growth (*Growth*), debt to equity ratio (*Lev*), years listed (*Age*), and firm size (*Size*). We also include $\sum Year_i$ and $\sum Industry_j$ variables in our regression to control year- and industry-fixed effects. Our primary interest is the coefficient estimate for the auditor variable, α_1. A α_1 value that is significantly greater than zero would indicate that Big 4 clients are more likely to face accounting related enforcement actions. The coefficient estimate for the auditor variable, α_1, is expected to be significantly negative if reputational concerns can motivate Big 4 auditors to exert greater efforts in preventing and detecting clients' financial reporting irregularities.

Our second test examines the effectiveness of Big 4 auditors in preventing and detecting clients' severe financial reporting irregularities. Given the primary objective of audit is to provide reasonable assurance that fraud does not result in material misstatement (SAS 99), auditors' effectiveness in preventing severe accounting violations should be of particular concern to investors and securities regulators. Specifically, we estimate the following regression equation:

$$D\_Severity\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon \quad (2)$$

Where $D\_Severity\_AREA_t$ is a severity indicator variable for severity of accounting related enforcement actions, which equals one if the client is only condemned or warned by securities regulators, equals two if the client is fined, and equals zero if the client is not subject to any accounting related enforcement actions. All other variables are defined the same as above. Our primary interest is the coefficient estimate for the auditor variable, α_1. A α_1 value that is significantly greater than zero would indicate that Big 4 clients are more likely to face severe accounting related enforcement actions than non-Big 4 clients. Prior studies document evidence that Big 4 firms lost clients following cases of extreme reputation loss. While litigation risk is low in China, Big 4 firms still have strong incentives to protect their international reputation and their large client base. Big 4 auditors, therefore, are expected to exert greater efforts in preventing and

detecting clients' severe financial reporting irregularities even in low litigation environment. Thus, the coefficient estimate for the auditor variable, α_1, is expected to be significantly negative.

Next, we use China's domestic Big 4 (i.e., the four largest Chinese domestic audit firms) instead of the international Big 4 in examining the differences in the frequency and severity of accounting related enforcement actions between China's domestic Big 4 and non-Big 4 clients. We use China's domestic Big 4 instead of the international Big 4 in our final test for two reasons. First, unlike audit markets in many developed economies where the international Big 4 firms have a predominant market share, the international Big 4's share of China's non-state-owned listed companies is relatively small. Of our 7,011 observations, the international Big 4 account for 185 (or 2.6%) of the total observations. In contrast, China's domestic Big 4 account for 2,231 (or 31.8%) of the total observations. Second, the size difference between international Big 4 and China's domestic Big 4 is narrowing (according to the latest ranking, the second and third largest accounting firms in China are domestic accounting firms). Given China's domestic Big 4 firm size, they should also have strong incentives to protect their reputation and large client base. Thus, tests using China's domestic Big 4 not only can ensure that the results from our international Big 4 tests are not driven by China's domestic Big 4, but can also provide further evidence regarding the reputational effect on audit quality. Specifically, we delete international Big 4 clients from our sample and estimate Equations (1) and (2) using the resulting subsample. If reputational concerns alone are adequate to motivate large audit firms to provide higher quality audit services, the coefficient estimate for China's domestic Big 4 should be significantly negative.

3. Sample Selection and the Data

Our sample consists of all non-state-owned companies listed in China's stock exchanges for the period of 2007 to 2015. Our initial sample is obtained from the China Securities Market and Accounting (CSMAR) database. We exclude from our sample (1) financial and insurance companies because they have special operating characteristics and are subject to special accounting rules and additional regulations, (2) companies with missing data, (3) companies with unusually high debts to assets ratios (debts to assets ratio >1), (4) the year in which the company is listed for the first time, (5) privatized state-owned enterprises, and (6) companies that are subject to Special Treatment (ST) during the current or the previous year.[‡] The sample selection procedure yields 7,011 firm-year observations. Sample distributions are presented in Table 1.

TABLE 1 Sample Distributions

Panel A: Sample distribution by year

	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Total number of non-state-owned listed companies that meet the sample selection criteria	346	304	365	319	642	983	1232	1384	1436	7011
Companies subject to accounting related enforcement actions	10	10	16	16	51	99	134	133	154	623

[‡] A In 1998, stock exchanges in China implemented a stock listing rule which gives special treatment (ST) to stocks of listed companies that, among other things, have reported two consecutive years of accounting losses.

Panel B: Sample distribution by auditor firm size

	Total number of observations	Facing enforcement actions	%
International Big4 clients	185	16	8.65
China domestic big4 clients	2,231	202	9.05
Non-Big4 clients	4,595	405	8.81

Panel A of Table 1 presents sample distribution by year and type of enforcement actions. Specifically, Panel A shows that for the period of 2007 to 2015, there are 623 accounting related enforcement actions against non-state-owned listed companies, which account for 8.9% of the total observations. Panel A also shows a significant increase in enforcement actions by securities regulators in China since 2011.

Panel B of Table 1 presents the sample distribution by audit firm size. Panel B reveals 8.65% of the international Big 4 clients, 9.05% of China's domestic Big 4 clients, and 8.81% of non-Big 4 clients were subject to accounting related enforcement actions. Panel B reveals no significant differences in accounting related enforcement actions among international Big 4, China's domestic Big 4, and non-Big 4 clients. However, these sample distribution statistics do not control for other factors.

Sample descriptive statistics of control variables are presented Table 2. The descriptive statistics reveal that, unlike the audit markets in many developed economies where Big 4 clients are generally larger in size, there are no significant differences in clients' firm size in our sample.

TABLE 2 Sample Descriptive Statistics

Panel A: Sample descriptive statistics – International Big 4 clients

Variable	Mean	Min	Median	Max	Std.Dev	N
D_AREA	0.865	0	0	1	0.28	185
D_Severity	0.146	0	0	2	0.44	185
Top1	40.96%	11.01%	39.14%	75.92%	0.17	185
Dual	21.62%	0	0	1	0.41	185
LnDirector	2.29	1.79	2.30	2.71	0.22	185
HLD_M	3.39%	0	0.03%	54.90%	0.10	185
Cash	7.09%	-15.94%	7.83%	27.32%	0.08	185
DC	2.13%	0	2.07%	7.76%	0.02	185
ROA	6.27%	-7.71%	4.99%	21.37%	0.05	185
Growth	18.84%	-68.94%	12.83%	2.20%	0.36	185
Lev	49.88%	5.45%	49.73%	86.01%	0.18	185
Age	2.23	0.69	2.49	3.14	0.66	185
Size	22.96	20.14	22.87	25.40	1.19	185

Panel B: Sample descriptive statistics – China's domestic Big 4 clients

Variable	Mean	Min	Median	Max	Std.Dev	N
D_AREA	0.905	0	0	1	0.29	2231
D_Severity	0.169	0	0	2	0.43	2231
Top1	33.74%	8.70%	31.92%	75.92%	0.15	2231
Dual	36.80%	0	0	1	0.48	2231
LnDirector	2.23	1.79	2.30	2.77	0.16	2231
HLD_M	10.85%	0	1.74%	58.16%	0.16	2231
Cash	4.23%	-22.50%	4.21%	27.32%	0.08	2231
DC	1.95%	0	1.65%	7.76%	0.02	2231
ROA	4.85%	-27.26%	4.41%	21.37%	0.05	2231
Growth	20.75%	-71.74%	13.38%	466.64%	0.52	2231

Lev	36.49%	4.59%	34.44%	95.26%	0.20	2231
Age	1.91	0.69	1.79	3.26	0.64	2231
Size	21.47	18.95	21.34	25.51	0.97	2231

Panel C: Sample descriptive statistics – Non-Big 4 clients

Variable	Mean	Min	Median	Max	Std.Dev	N
D_AREA	0.881	0	0	1	0.28	4595
D_Severity	0.162	0	0	2	0.43	4595
Top1	33.02%	8.70%	30.20%	75.92%	0.14	4595
Dual	30.29%	0	0	1	0.46	4595
LnDirector	2.24	1.79	2.30	2.77	0.17	4595
HLD_M	8.48%	0	0.06%	58.16%	0.15	4595
Cash	3.51%	-22.50%	3.66%	27.32%	0.08	4595
DC	2.14%	0	1.98%	7.76%	0.02	4595
ROA	4.42%	-27.26%	4.11%	21.37%	0.05	4595
Growth	23.66%	-68.94%	14.94%	466.64%	0.48	4595
Lev	40.17%	4.59%	39.97%	98.05%	0.21	4595
Age	1.99	0.69	1.95	3.26	0.67	4595
Size	21.37	18.95	21.26	25.62	0.98	4595

D_AREA is an indicator variable which equals one if the client faces accounting related enforcement actions, and zero otherwise; *D_OREA* is an indicator variable which equals one if the client faces operations related enforcement actions, and zero otherwise; *D_EREA* is an indicator variable which equals one if clients' executives face enforcement actions, and zero otherwise; *D_Severity* is a severity indicator variable which equals one if the client is warned, equals two if the client is fined, and zero otherwise; Top1 is the largest shareholder's percentage ownership; *Dual* is an indicator variable which equals one if chairman of the board also serves as the CEO, and zero otherwise; *LnDirector* is the natural logarithm of the number of director; *HLD_M* is the percentage ownership of management; shareholding by management; *Cash* is the net cash flow from operations scaled by total assets; *DC* is the debt cost which equals total interest expense scaled by total debts; *ROA* is the return on assets; *Growth* is the annual sales growth rate; *Lev* is the debt to equity ratio; *Age* is the natural logarithm of years listed; *Size* is the natural logarithm of end of year total assets.

4. Empirical Tests and Results

4.1 Tests of the frequency of accounting related enforcement actions

We test the difference in the frequency of accounting related enforcement actions (AREAs) between Big 4 and non-Big 4 clients by estimating Equation (1), which controls for clients' reporting incentives and industry and year fixed-effect. The results are reported in Table 3. Our focus is on the coefficient estimate of the auditor variable, α_1. Since the auditor indicator variable, *Big4*, equals one for Big 4 clients and zero otherwise, a negative coefficient of *Big4* would be indicative that Big 4 clients face accounting related enforcement actions less frequently than non-Big 4 clients. If reputational concerns alone can motivate Big 4 auditors to exert greater efforts in preventing and detecting clients' financial reporting frauds in China's low litigation risk audit market, we would expect α_1 to be significantly less than zero. The coefficient estimate of *Big4* from probit regression is 0.1389 with a t-value of 0.97, indicating that α_1 is not statistically different from zero at 0.10 significance level (See Column A of Table 3). The result doesn't support the notion that Big 4 auditors are more effective in preventing and detecting financial reporting frauds in China's low litigation risk audit market (Palmrose 1988; Becker et al. 1998; Khurana and Raman 2004; Behn et al. 2008).

TABLE 3 Regression Results on the Frequency of Accounting Related Enforcement Actions – Big 4 versus Non-Big 4

$D\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon$

Variable	Probit Regression D_AREA_t	Two-Way Clustered Analysis D_AREA_t
Cons	-0.513	-0.513
	(-0.86)	(-1.07)
Big4	0.139	0.139
	(0.970)	(0.950)
Top1	-0.239	-0.239
	(-1.42)	(-1.24)
Dual	0.032	0.032
	(-0.610)	(-0.570)
LnDirector	-0.003	-0.003
	(-0.02)	(-0.03)
HLD_M	-0.031	-0.031
	(-0.17)	(-0.14)
Cash	-0.474	-0.474
	(-1.43)	(-1.37)
DC	2.861*	2.861*
	(-1.960)	(-1.870)
ROA	-3.034***	-3.034***
	(-5.71)	(-6.99)
Growth	0.048	0.048
	(-1.190)	(-1.410)
Lev	0.495***	0.495***
	(-3.270)	(-3.100)
Age	0.028	0.028
	(-0.600)	(-0.500)
Size	-0.061**	-0.061***
	(-2.37)	(-3.50)
Year	Yes	Yes
Industry	Yes	Yes
N	6659	6659
chi2	3643.866	2507.895
R^2_p	0.057	0.057

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, two-tailed.
The column named "Two-way Clustered" is the regression results using Petersen's (2009) two-way clustered method.
Variables are defined in table 2.

The results reported in Column A of Table 3 are from probit regression using panel data pooled across firms and over time. Standard errors from the probit regression will be consistent as long as the regression residuals are uncorrelated across firms and over time. However, such uncorrelatedness is unlikely to hold in our research context because of both market-wide shocks that induce correlation among firms and persistent firm-specific shocks that induce correlation over time (Thompson, 2011). To correct for simultaneous correlation along these two dimensions, we adjust standard errors for the correlation across firms and over time by clustering two-ways (firm and time) using Petersen's two-way clustered method. We compute the covariance estimator by

adding the estimator that clusters by firms to the estimator that clusters by time and subtracting the usual heteroscedasticity-robust covariance matrix. Results from the two-way clustered analysis using Equation (1) are reported in Table 3, Column B. The regression results from Petersen's two-way clustered analysis in Column B are substantially the same as those in Column A, suggesting that our results are not driven by the correlation across firms and over time in our panel data. Taken together, the findings in Table 3 show that Big 4 auditors are no more effective in preventing and detecting clients' financial reporting irregularities than non-Big 4 auditors.

4.2 Tests of the severity of accounting related enforcement actions

In this section, we test if Big 4 clients are less likely to face severe accounting related enforcement actions than non-Big 4 clients by estimating Equation (2). The results from probit regression and two-way clustered analysis are reported in Table 4, Column A and Column B, respectively. The coefficient estimate of the auditor variable, α_1, is 0.175 with a t-value of 1.19. α_1 does not have the predicted sign and is not statistically different from zero at 0.10 significance level, indicating that Big 4's non-state-owned clients in China are no less likely to face severe accounting related enforcement actions than non-Big 4 clients. This result is particularly troublesome given that the primary goal of auditing is to provide reasonable assurance that clients' financial statements are free of material misstatements.

TABLE 4 Regression Results on the Severity of Accounting Related Enforcement Actions – Big 4 versus Non-Big 4

$D\_Severity\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon$

Variable	Ordered Probit Regression D_Severity_AREA	Two-Way Clustered Analysis D_Severity_AREA
Big4	0.175	0.175
	(1.190)	(1.150)
Top1	-0.276*	-0.276
	(-1.66)	(-1.53)
Dual	0.040	0.040
	(-0.760)	(-0.710)
LnDirector	-0.008	-0.008
	(-0.06)	(-0.07)
HLD_M	-0.052	-0.052
	(-0.28)	(-0.25)
Cash	-0.405	-0.405
	(-1.23)	(-1.11)
DC	2.786*	2.786*
	(-1.950)	(-1.890)
ROA	-2.916***	-2.916***
	(-5.79)	(-6.39)
Growth	0.058	0.058
	(-1.350)	(-1.590)
Lev	0.474***	0.474***
	(-3.230)	(-3.000)
Age	0.041	0.041
	(-0.930)	(-0.770)
Size	-0.068***	-0.068***
	(-2.67)	(-3.97)

/cut1	0.385	0.385
	(-0.670)	(-0.780)
/cut2	1.337**	1.337**
	(-2.300)	(-2.530)
Year	Yes	Yes
Industry	Yes	Yes
N	6659	6659
chi2	3067.464	2032.146
R^2_p	0.051	0.051

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

The column named "Two-way Clustered" is the regression results using Petersen's (2009) two-way clustered method.

Variables are defined in table 2.

The results from the severity test reported in Table 4, taken together with the results from the frequency test in Table 3, suggest that there are no significant differences in the frequency or severity of accounting related enforcement actions between Big 4 and non-Big 4 clients. The results do not support the notion that in a low litigation risk audit market, reputational concerns can motivate Big 4 auditors to exert greater efforts in preventing and detecting clients' financial reporting irregularities.

4.3 Tests of audit quality using China's domestic Big 4

In this section, we use China's domestic Big 4 instead of the international Big 4 in our tests of the frequency and severity of clients' enforcement actions. We perform this test because international Big 4's market share of China's non-state-owned companies is rather small (2.9%) whereas China's domestic Big 4's market share is quite large (31.8%). Given China's domestic Big 4's large client base of non-state-owned companies, they should also have strong incentives to protect their reputation. Thus, tests using China's domestic Big 4 can provide additional insights regarding the reputational effect on audit quality. Although not tabulated, our test results for the international Big 4 reported in Tables 3 are unaltered after excluding China's domestic Big 4 from the sample, indicating that the results for international Big 4 are not driven by the domestic Big 4.

To test the frequency and severity of accounting enforcement actions against China's domestic Big 4, we delete international Big 4 clients from our sample. We use the same variable definitions except the auditor indicator variable, *Big4_cn*, which equals one for China's domestic Big 4 clients and zero otherwise. Regression results from Equations (1) and (2) are presented in Table 5.

TABLE 5 China's Domestic Big 4 Test Results – Frequency and Severity of Accounting Enforcement

Variable	Frequency of accounting related enforcement actions against Big 4_cn clients (D_AREA$_t$)		Severity of accounting related enforcement actions against Big 4_cn clients (D_Severity_AREA$_t$)	
	Probit regression	Two-way clustered analysis	Ordered Probit regression	Two-way clustered analysis
Cons	-0.630	-0.630		
	(-1.08)	(-1.33)		
Big4_ cn	-0.053	-0.053	-0.074	-0.074
	(-1.10)	(-1.16)	(-1.56)	(-1.60)
Top1	-0.235	-0.235	-0.270	-0.270
	(-1.40)	(-1.22)	(-1.63)	(-1.50)
Dual	0.035	0.035	0.045	0.045

	(-0.660)	(-0.630)	(-0.840)	(-0.790)
LnDirector	-0.003	-0.003	-0.009	-0.009
	(-0.02)	(-0.03)	(-0.07)	(-0.08)
HLD_M	-0.036	-0.036	-0.059	-0.059
	(-0.19)	(-0.17)	(-0.32)	(-0.29)
Cash	-0.442	-0.442	-0.361	-0.361
	(-1.33)	(-1.24)	(-1.10)	(-0.96)
DC	2.847*	2.847*	2.768*	2.768*
	(-1.950)	(-1.850)	(-1.940)	(-1.880)
ROA	-3.031***	-3.031***	-2.911***	-2.911***
	(-5.70)	(-6.97)	(-5.78)	(-6.34)
Growth	0.047	0.047	0.055	0.055
	(-1.140)	(-1.350)	(-1.300)	(-1.530)
Lev	0.489***	0.489***	0.466***	0.466***
	(-3.240)	(-3.070)	(-3.180)	(-2.970)
Age	0.025	0.025	0.038	0.038
	(-0.560)	(-0.450)	(-0.870)	(-0.700)
Size	-0.056**	-0.056***	-0.060**	-0.060***
	(-2.19)	(-3.12)	(-2.41)	(-3.54)
/cut1			0.531	0.531
			(-0.930)	(-1.090)
/cut2			1.484***	1.484***
			(-2.600)	(-2.860)
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
N	6659	6659	6659	6659
chi2	3834.387	2560.975	3276.569	2065.062
R^2_p	0.057	0.057	0.051	0.051

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, two-tailed.
The column named "Two-way Clustered" is the regression results using Petersen's (2009) two-way clustered method.
Variables are defined in table 2.

Columns A and B of Table 5 present the results from probit regression and two-way clustered analysis on the frequency test of accounting related enforcement actions whereas Columns C and D present the results on the severity test. None of the coefficient estimates for *Big4_cn* is statistically different from zero at 10% level (see Table 5), indicating no significant differences in likelihood of enforcement actions against China's domestic Big 4 and non-Big 4 clients. Although not tabulated, the results are substantially the same from two-way clustered analysis.

In summary, based on the evidence from China's non-state-owned listed companies, we find no significant differences in the frequency or severity of accounting enforcement actions between Big 4 and non-Big 4 clients. The findings do not support the notion that Big 4 auditors are more effective in detecting financial reporting frauds and irregularities. When using China's domestic Big 4 instead of the international Big 4, we find no significant differences in the frequency and severity of accounting enforcement actions either. Taken together, our findings do not support the notion that reputational concerns alone are adequate to motivate international Big 4 or China's domestic Big 4 auditors to exert greater efforts in preventing and detecting clients' accounting frauds in a low litigation risk audit market. The findings highlight the importance of legal reforms for improving audit quality.

4.4 Additional sensitivity tests

In our tests of enforcement actions against Big 4 versus non-Big 4 clients, we have controlled for firm-level reporting incentives that are known to affect client accounting quality, included industry- and year-fixed effect in our regressions, and corrected the correlation across firms and over time in our panel data. To ensure the robustness of our findings, we perform several additional sensitivity tests in this section.

Tests using Heckman's two-stage model. Audit literature suggests that companies with good internal control and high accounting quality are more likely to select Big 4 auditors to signal to the market while companies with low accounting quality would not select Big 4 auditors because they don't want their reporting irregularities to be detected. We use Heckman's two-stage model to ensure that our test results are not driven by clients' self-selection bias. Although not tabulated, the regression results using Heckman's two-stage model are substantially the same as those reported earlier, suggesting that our results are not driven by clients' self-selection bias. It is worth mentioning that to the extend we could not fully control for clients' self-selection bias, it may bias against our findings of no significant differences in enforcement actions between Big 4 and non-Big 4 clients.

Tests using the propensity-score matching (PSM) procedure. In addition to audit quality, clients' reporting quality is also affected by firm-specific reporting incentives. Even though we have included control variables in our regressions, to ensure that our results are not driven by firm characteristics, we use the propensity-score matching (PSM) procedure to generate a matching sample of non-Big 4 clients. The regression results are reported in Tables 6 and 7. The results are substantially the same as those reported earlier, suggesting that our results are not driven by clients' characteristics.

TABLE 6 Test Results on Frequency of Accounting Enforcement Actions Using the Propensity Score Matching (PSM) Procedure

$D\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon$

Variable	International Big 4 D_AREA_t	China Domestic Big 4 D_AREA_t
Cons	-0.746	-0.855
	(-0.91)	(-1.06)
Big4	0.195	
	(1.22)	
Big4_cn		-0.060
		(-1.08)
Top1	-0.128	-0.123
	(-0.63)	(-0.60)
Dual	0.014	0.016
	(0.21)	(0.25)
LnDirector	0.070	0.067
	(0.43)	(0.41)
HLD_M	-0.150	-0.155
	(-0.67)	(-0.69)
Cash	-0.538	-0.507
	(-1.26)	(-1.19)
DC	3.380*	3.356*
	(1.86)	(1.85)
ROA	-3.145***	-3.139***

Variable		
	(-4.58)	(-4.56)
Growth	0.031	0.030
	(0.55)	(0.52)
Lev	0.480**	0.474**
	(2.53)	(2.51)
Age	0.064	0.063
	(1.13)	(1.11)
Size	-0.072**	-0.066**
	(-2.30)	(-2.11)
Year	Yes	Yes
Industry	Yes	Yes
N	4420	4420
chi2	1499.324	1602.009
R^2_p	0.059	0.059

*, **, *** Denotes statistical significance at the 10%, 5%, and 1% levels, respectively, two-tailed.
All test results are from probit regressions. Although not tabulated, our conclusions are unaltered using Petersen's (2009) two-way clustered method.
Variables are defined in table 2.

TABLE 7 Test Results on Severity of Accounting Enforcement Actions Using the Propensity Score Matching (PSM) Procedure

$D\_Severity\_AREA_t = \alpha_0 + \alpha_1 Big4 + \alpha_2 Top1_{t-1} + \alpha_3 Dual_{t-1} + \alpha_4 LnDirector_{t-1} + \alpha_5 HLD\_M_{t-1} + \alpha_6 Cash_{t-1} + \alpha_7 DC_{t-1} + \alpha_8 ROA_{t-1} + \alpha_9 Growth_{t-1} + \alpha_{10} Lev_{t-1} + \alpha_{11} Age_{t-1} + \alpha_{12} Size_{t-1} + \sum Year_i + \sum Industry_j + \varepsilon$

Variable	International Big 4 $D\_Severity\_AREA_t$	China Domestic Big 4 $D\_Severity\_AREA_t$
Big4	0.227	
	(1.37)	
Big4_cn		-0.083
		(-1.53)
Top1	-0.149	-0.142
	(-0.73)	(-0.70)
Dual	0.004	0.008
	(0.06)	(0.13)
LnDirector	0.055	0.052
	(0.34)	(0.32)
HLD_M	-0.124	-0.129
	(-0.55)	(-0.58)
Cash	-0.441	-0.401
	(-1.05)	(-0.95)
DC	3.505*	3.480*
	(1.96)	(1.94)
ROA	-2.959***	-2.951***
	(-4.68)	(-4.65)
Growth	0.029	0.027
	(0.50)	(0.47)
Lev	0.437**	0.432**
	(2.37)	(2.35)
Age	0.078	0.076
	(1.42)	(1.39)
Size	-0.074**	-0.066**

	(-2.39)	(-2.14)
/cut1	0.784	0.901
	(0.99)	(1.14)
/cut2	1.739**	1.857**
	(2.20)	(2.35)
Year	Yes	Yes
Industry	Yes	Yes
N	4420	4420
chi2	1394.727	1510.496
R^2_p	0.052	0.052

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

All test results are from probit regressions. Although not tabulated, our conclusions are unaltered using Petersen's (2009) two-way clustered method.

Variables are defined in table 2.

5. Summary and Concluding Remarks

We examine whether the reputation protection incentive can motivate Big 4 firms to exert greater efforts in preventing and detecting clients' reporting irregularities in China's low litigation risk audit market. Using a sample of 7,011 firm-year observations of non-state-owned listed companies in China, we find no significant differences in the frequency or severity of accounting related enforcement actions between Big 4 and non-Big 4 clients. Our findings do not support the notion that reputational concerns can motivate Big 4 firms to provide higher quality audits in China's low litigation risk audit market.

We also use China's domestic Big 4 instead of international Big 4 in our tests. Given domestic Big 4's large market share of China's non-state-owned companies, they should have strong incentives to protect their reputation and their large client base. However, we find no significant differences in the frequency or severity of accounting enforcement actions between China's domestic Big 4 and non-Big 4 clients. Taken together, our findings do not support the notion that the incentive to protect their reputation and large client base can motivate large audit firms to provide higher quality audit services.

References

Allen, F., Qian, J., and M. Qian, M. 2005, 'Law, finance, and economic growth in China', *Journal of Financial Economics,* 77(1): 57-116.

Becker, C., DeFond, M., Jiambalvo, J. and Subramanyam, K. R. 1998, 'The effect of audit quality on earnings management', *Contemporary Accounting Research*, 15(1): 1-24.

Behn, B., Choi, J. H. and Kang, T. 2008, 'Audit quality and properties of analyst earnings forecasts', *The Accounting Review*, 83(2): 327-359.

Bell, T.B., Doogar, R. and Solomon, I. 2008, 'Audit labour usage and fees under business risk auditing', *Journal of Accounting Research*, 46(4): 729-760.

Boone, J., Khurana, I. and Raman, K. 2010, 'Do the Big 4 and the second-tier firms provide audits of similar quality?', *Journal of Accounting and Public Policy*, 29(4): 330-352.

CFA Institute Center 2009, DG MARKT: Consultation on control structures in audit firms and their consequences on the audit market, Working paper, CFA Institute.

Caramanis, C., and Lennox, C. 2008, 'Audit effort and earnings management', *Journal of Accounting and Economics*, 45: 116-138.

Chen, S., Sun S. Y. J. and Wu, D. *2010*, 'Client importance, institutional improvements, and audit quality in China: An office and individual auditor level analysis', *The Accounting Review*, 85(1): 127-158.

Choi, J.H., Kim, J.B., Liu, X. and Simunic, D.A. 2008, 'Audit pricing, legal liability regimes, and Big 4 premiums: theory and cross-country evidence', *Contemporary Accounting Research*, 25(1): 55-99.

DeAngelo, L. 1981, 'Auditor size and audit quality', *Journal of Accounting and Economics*, 3(3): 183-199.

DeFond, M. and Lennox, C. 2011, 'The effect of SOX on small auditor exits and audit quality', *Journal of Accounting & Economics*, 52(1): 21-40.

DeFond, M. and Zhang, J. 2014, 'A review of archival auditing research', *Journal of Accounting and Economics*. 58(2-3): 275-326.

DeGeorge, E.T., Ferguson, C.B. and Spear, N.A. 2013, 'How much does IFRS cost? IFRS adoption and audit fees', *The accounting Review*, 88(2): 429-462.

Dopuch, N. and Simunic, D. 1980, 'The nature of competition in the auditing profession: a descriptive and normative view', *Regulation and the Accounting Profession* edited by J. Buckley and F. Weston, Belmont, CA: Lifetime Learning Publications. 34(2): 283-289.

Francis, J. R. and Yu, M. D. 2009, 'Big 4 office size and audit quality', *The Accounting Review*, 84(5): 1521-1552.

Habib, A., Jiang, H., Bhuiyan, M. and Islam A. 2014, 'Litigation risk, financial reporting and auditing: A survey of the literature', *Research in Accounting Regulation*, 26 (2): 145-163.

Johnstone, K.M. and Bedard, J.C. 2004, 'Audit firm portfolio management decisions', *Journal of Accounting Research,* 42(4): 659-690.

Ke, B., Lennox, C.S. and Xin, Q. 2015, 'The effect of China's weak institutional environment on the quality of Big 4 audits', *The Accounting Review*, 90 (4): 1591 – 1619.

Khurana, I. and Raman, K. 2004, 'Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries', *The Accounting Review*, 79(2): 473-495.

Knechel, R.W., Salterio, S. and Ballou, B. 2007, 'Auditing: Assurance and risk', South-Western College Publishing.

Krishman, G. 2003, 'Audit quality and the pricing of discretionary accruals', *Auditing: A Journal of Practice & Theory*, 22(1): 109-126.

Lawrence, A., Minutti-Meza, M. and Zhang, P. 2011, 'Can Big 4 versus non-Big 4 differences in audit quality proxies be attributed to client characteristics?', *The Accounting Review*, 86(1): 259-286.

Legoria, J., Rosa, G. and Soileau, J.S. 2017, 'Audit quality across non-audit service fee benchmarks: Evidence from material weakness opinions', *Research in Accounting Regulation*, 29 (2): 97-108.

Li, C., Song, F. and Wong, S. M. 2008, 'A continuous relation between audit firm size and audit opinions: evidence from China', *International Journal of Auditing*, 12(2): 111-127.

Moizer, P. 1997, 'Auditor reputation: the international empirical evidence', *International Journal of Auditing*, 1(1): 61-74.

Monroe, G.S., Juliana, N. & Wellington, A.J. 1992, 'Limiting auditors' liability: The potential consequences', *Australian Accounting Review*, 1(4): 16-26.

Palmrose, Z. V. 1998, 'An analysis of auditor litigation and audit service quality', *The Accounting Review*, 63(1): 55-73.

Seetharaman, A., Gul, F.A. and Lynn, S.G. 2002, 'Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets', *Journal of Accounting and Economics*, 33: 91-115.

Skinner, D.J. and Srinivasan, S. 2012, 'Audit quality and audit reputation: Evidence from Japan', *The Accounting Review*, 87(5): 1737-1765.

Thompson, S.B. 2011, 'Simple formulas for standard errors that cluster by both firm and time', *Journal of Financial Economics*, 99(1): 1-10.

Weber, J., Willenborg, M. and Zhang, J. 2008, 'Does auditor reputation matter? The case of KPMG Germany and ComROAD AG', *Journal of Accounting Research*, 46(4): 941-972.