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Sustainable Development of Audit Market: Benefits of Audit Price Deregulation in China

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Abstract: Utilizing a unique audit price deregulation policy in China, we examine industry-specialized auditors' competing strategies in different markets. Our results from the difference-in-difference model reveal that after audit price deregulation, audit fees of industry-specialized auditors in less developed markets become significantly lower than other auditors. Furthermore, we find the decreased audit fees of the industry specialists are not due to the reduced audit effort, and the audit quality is not impaired. On the other hand, industry specialists cannot keep their audit fee premium in more developed markets after the policy. These results indicate that audit price deregulation makes industry-specialized auditors more available, which benefits the market's sustainable development. Our study contributes significantly to the industry specialized auditor literature by providing novel evidence that industry specialists' competing strategies could depend on the market's development.

Keywords: audit price deregulation; competing strategy; audit fees; audit quality

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1. Introduction

This study investigates the effects of the audit price deregulation policy on audit firms' competing strategies. The auditing literature generally examines audit firms competing strategies based on Porter's (1985) theory of competition [1,2]. According to Porter [3], a firm can adopt one of two competitive strategies: product differentiation or cost minimization. A firm can attempt to differentiate its product from competitors to build barriers and reduce head-to-head competition. On the other hand, the firm can pass on economies related to production costs, enabling it to compete in the market on price. A product differentiation strategy applied to the auditing industry entails the audit firm achieving a higher quality audit with higher audit fees.

In contrast, a cost minimization strategy involves the audit firm charging lower fees, acquired by the reduced marginal cost of serving additional clients. That being said, academic research has examined the differentiation strategy of industry-specialized auditors and, to a much lesser extent, cost-leading strategy [4]. Therefore, it is still crucial to examine whether (and in what settings) the industry-specialized auditors would adopt cost leading strategy [4].

One of the reasons for the relatively limited studies on the auditors' cost-leading strategy could be that auditors' input cost is generally not publicly available. Researchers usually study auditors' cost savings by observing a reduction of audit fees, which follows the economic literature that companies could pass their economy of scale through price reduction [5]. However, audit fees represent the product's price rather than the input cost (effort). A decrease in audit effort does not necessarily translate into a reduction in audit fees if the industry-specialized audit firms can keep the value of economy of scale from sharing with their clients. For example, Gong, Li, Lin and Wu [5] found out that even though the audit hours are significantly reduced after the merging and acquisition of accounting firms, it does not result in reduced audit fees.

According to Porter's (1985) theory of competition, the adoption of the competition strategy depends on the customers' ability to value the products. Indeed, Cahan, et al. [6] suggest that auditors pursue different production and pricing strategies in various market segments. For example, in more developed markets such as the USA, an auditor's reputation has value, and capital markets do not view all audits equally. It is not surprising to find that a lot of research has evidenced the success of the audit firms' differentiation strategy [2]. Whereas in less developed markets such as China, auditing service is not much appreciated by the investors, and listed firms are susceptible to audit pricing, rendering differentiation a risky strategic choice [7].

We investigate auditors' competing strategies by taking advantage of China's audit price deregulation policy. The Chinese government has set the minimum audit fees for the capital market since the 1980s to keep the audit quality from price competition. With the development of the audit market, the National Development and Reform Commission (NDRC) announced the deregulation of the audit price restrictions starting on 1 January 2015 [8]. Consistent with conjectures of prior studies, we expect industry specialized auditors' competing strategies is dependent on the development of the market. Specifically, we expect that after the policy, industry specialists are more likely to adopt cost leading strategy in the less developed market (i.e., offering audit fee discounts). In contrast, the differentiation strategy is more likely to be adopted in more developed markets (i.e., charges audit fee premium).

Our difference-in-difference (DID) results show that in less developed markets, industry specialists offer significantly lower audit fees than other auditors after the audit price deregulation policy (hereafter the policy). Also, we find that the discounted fee of industry-specialized auditors is not due to reduced audit effort, and engagement audit quality with audit fee discount is not compromised. The evidence supports that the industry specialists adopted cost leading strategy in less developed markets after the policy. On the other hand, in more developed markets, we observe that industry specialists charge a fee premium before the policy, but this premium is lost after the policy, which suggests that the differentiation strategy is not maintained with the increased competition after the policy. That being said, the reduced audit fees of industry specialists in more developed markets are found not to impair the audit quality. We find evidence supporting industry specialists pursuing a cost-leading strategy in less developed markets after the policy. However, we find industry specialists do not pursue a differentiation strategy in more developed markets, which might be due to the intensive competition among the capital markets in China.

The contributions of our study are threefold. Firstly, we contribute to the competing strategy of industry-specialized auditors. Prior studies observed auditors' cost-leading strategy condition on the type of audit firm [9], the proportion of clients audited in a specific industry [6], level of industry specialization [4], and industry characteristics [10–12]. We add to this line of literature by showing the auditor's competing strategy based on the market development.

Secondly, we contribute to the audit industry specialization literature by providing evidence on the effect of industry-specialized auditors. While a long list of studies have tried to investigate if industry-specialized auditors charge fee premiums and offer high-quality audits [13–15], there is a short list of studies examining when industry-specialized auditors would change their competing strategy. The evidence is mixed in the limited studies on auditors' cost-leading strategy. We provide evidence that auditors would utilize their economy of scale to compete in the audit market with lower fees but quality service.

Thirdly, as regulators continue to express concerns about the consolidation of audit firms and concentration in the audit market [15,16], our findings contribute to the debate by showing that industry-specialized auditors can pass economies of scale without sacrificing quality. Both auditors and client firms benefit in these settings because client firms receive a quality audit at a competitive price, while the auditor can benefit from an increased likelihood of retaining these clients and developing a further specialization. This will lead to the sustainable development of the capital market.

The remainder of this study proceeds as follows. Section 2 presents the institutional background. Section 3 presents the literature review and develops our hypotheses. Section 4 describes the research design, and Section 4 reports and analyzes our empirical results. Section 5 concludes the study.

2. Institutional Background

The auditing standards of the International Accounting Standards Board (IASB) have kept evolving in recent years [17,18]. However, China's unique auditing standards provide a unique setting to conduct analysis that is less likely to be investigated elsewhere [19]. One of China's exceptional auditing standards is the restriction on minimum audit fees and the release of that restriction [20]. The policy of restraint on audit fees is rare around the world. The USA Florida was the last state restricting audit prices but was released later. Another similar case is in Japan [21].

The restriction on audit price competition in China can be traced back to the 1980s. As shown in Table 1, the earliest rule on audit price can be found in "Accounting service price regulation" published in 1989, where the MOF stipulates that audit firms should not bid for clients through audit fee discounts. The local government penalizes any audit firm that is found to conduct the lowballing practice. Later in "Intermediary service price regulation" published in 1999, the Ministry of Finance (MOF) further provided instructions that audit prices should be calculated using the guidelines given by the government. In 2010, the MOF issued "Administrative Measures on Accounting Fees for Accounting Firms", further emphasizing audit price control. The MOF also specified in 2011 that any offer from audit firms for audit services should not be under 75% of the audit price as regulated by the local government. Otherwise, the proposal is invalid. However, in 2014, the National Development and reform committee (NDRC) issued the new policy "Notice of the NDRC on the release of some service price opinions", which opened the restriction on audit prices.

Table 1. Audit price regulation.

Year	Department Name	Act Name
1989	MOF	Accounting service price regulation
1999	MOF	Intermediary service price regulation
2010	MOF	Administrative Measures on Accounting Fees for Accounting Firms
2011	MOF	Notice of "Administrative Measures on Accounting Fees for Accounting Firms"
2014	NDRC	Notice of the NDRC on the release of some service price opinions

The over 30-year audit price restriction has ended with the new deregulation policy. China has set restrictions on audit fees since the 1980s. Audit price regulation aims to mitigate the price competition, especially by offering a discount at the initial audit engagement so that audit firms can survive more easily at the beginning of the market development [22,23]. However, the audit price regulation has received various criticisms since its enactment. One of the main criticisms is that intervention from the government on audit price could constrain the function of the market mechanism, which may constrain the audit market development. The regulators expect that after the audit price is deregulated, the audit market could develop more under the market regularity. NDRC [8] specifies in the announcement that the purpose of audit price deregulation is to reduce the intervention from the government and make the market mechanism more determinant in the development of the audit market.

3. Literature Review and Hypothesis Development

3.1. The Competing Strategy of the Industry-Specialized Auditor

The auditing literature generally examines audit firms competing strategies based on Porter's (1985) theory of competition [1,2]. According to Porter [3], a firm can adopt one of two competitive strategies: product differentiation or cost minimization. A firm can attempt to differentiate its product from competitors to build barriers and reduce head-to-head competition. On the other hand, the firm can pass on economies related to production costs, enabling it to compete in the market on price. A product differentiation strategy applied to the auditing industry entails the audit firm achieving a higher quality audit with higher audit fees. In contrast, a cost minimization strategy involves the audit firm charging lower fees, achieved by the reduced marginal cost of serving additional clients.

Many studies have documented that industry expert auditors adopt a differentiation strategy and charge specialist fee premiums with high-quality audits, for example, [1,2,24,25]. The underlying rationale is that the industry-specific knowledge initially requires significant investments in audit technology and human capital development [12]. The industry expert auditors would charge fee premiums to recover their initial investment and differentiated services.

However, studies on auditors' cost minimization strategies are relatively rare [4]. Auditors focusing their efforts on specific industries may also benefit from cost-based competitive advantages [5]. After the initial investment, additional clients can be serviced at a lower marginal cost than the cost of servicing the first few clients. As a result, economies of scale also arise from increased efficiencies due to specialization when auditors can share costs across several clients [12]. A few studies suggest that the potential for fee discounts derives from industry-specialized auditors' economies of scale (EOS) [4,6,12]. Bills, Jeter and Stein [12] further provide evidence that industry-specialized auditors are also conducive to homogenous industries that they reduce audit fees without impairing audit quality.

The limited literature on the auditor firms' cost minimization strategy might be because the audit firms only pass their economy of scale with conditions. For example, Gong, Li, Lin and Wu [5] found out that even though the audit hours are significantly reduced after the merging and acquisition of accounting firms, it does not result in reduced audit fees. Indeed, Fung, Gul and Krishnan [4] suggest that whether the industry-specialized auditors choose to share cost savings with a client may result from internal and external functions. From internal function, industry-specialized auditors would discount their audit service to achieve a significant share when the industry competition is high [6]. From the external function, industry-specialized auditors may be "forced" to pass their economy of scale to their clients according to the client bargaining power, perceived threat of client loss, and extent of cost savings [4,5,12].

3.2. Effect of Regional Market Development

According to Porter's (1985) theory of competition, the adoption of the competition strategy depends on the customers' ability to value the products. The differentiation strategy is suitable for customers who pursue the quality of the product rather than a low price. In contrast, the cost-leading strategy is ideal for customers who seek low cost rather than product quality [3]. The auditing service has some attributes of credence good whose quality is difficult to evaluate by the customers, which is a significant barrier to consumers' willingness to pay [26]. Therefore, adopting the competing strategy of audit firms could largely depend on the capital market development whose players, such as investors, shareholders, intermediaries, etc., are capable of valuing the quality of the auditing service.

For example, in more developed markets such as the USA, the auditing market is concentrated and owned mainly by large-sized audit firms such as Big4 accounting firms [27,28]. An auditor's reputation has value, and capital markets do not view all audits equally, so auditors can pursue a differentiation strategy and charge an audit fee premium [2]. Therefore, auditors in the more developed market such as the USA are more

motivated to pursue a differentiation strategy, as indicated by high-quality service and high audit fees. It is not surprising to find that a lot of research has evidenced the success of the audit firms' differentiation strategy.

In contrast, the auditing service is not much appreciated by the investors in less developed markets even though auditing reduces the information asymmetries. For example, Wei, Xiao and Zhou [7] report that the increased domestic investors of the listed firms in China also increased the likelihood of changing auditors from Big N auditors to non-Big N auditors. Apart from consumer behavior, auditing is also a reflection of legal systems, which makes it challenging for firms to pursue "differentiated auditing services" in less developed capital markets. Indeed, listed firms in emerging markets such as China are susceptible to audit pricing, rendering differentiation a risky strategic choice. For example, Big N auditors in China were also more effective than local auditors [29]. Also, Big N auditors charge much higher audit fees than other audit firms [5]. However, unlike developed markets, the auditing market in China is quite dispersed, and Big N auditors only have small shares [30].

In sum, whether audit firms can effectively differentiate depends on the market context and the extent to which resource providers such as consumers appreciate the auditor's industry specialization. In less developed markets, firms' industry specialization may not translate into higher willingness-to-pay by consumers (or higher willingness-to-supply by employees) as in developed markets. Based on the discussion above, we expect that the effect of the audit fee deregulation policy on audit firms' competition strategy varies with the regional market development. Specifically, we develop our hypothesis as:

H1. *In less developed markets, industry specialist auditors are more likely to offer fee discounts after the audit price deregulation.*

H1a. *In less developed markets, industry specialist auditors who offer fee discounts after the audit price deregulation are not likely to reduce auditing efforts.*

H2. *In more developed markets, industry specialist auditors are more likely to charge fee premiums after the audit price deregulation.*

4. Research Design

4.1. Difference-In-Difference (DID) Model

To test our first hypothesis, we used the following DID OLS regression model to test the deregulation effect on the pricing strategy of the industry-specialized auditors as follows:

$$AF = \alpha + b1 \times TREAT \times POLICY + b2 \times TREAT + b3 \times POLICY + \delta \times CONTROLS + IND\ FIXED + \varepsilon \quad (1)$$

The dependent variable is AF, measured as the logarithm of total audit fees. The independent variable of interest is the interaction term of TREAT and POLICY (TREAT × POLICY), which directly tests the audit price difference of industry specialists between the pre-policy period and post-policy period (i.e., difference-in-difference). The independent variable TREAT is the proxy for industry specialists. We followed prior studies on auditor competing strategies to measure industry-specialized auditors at the audit firm level. Hereafter, auditors indicate audit firms. Specifically, TREAT equals one if the square root of total assets of auditor firm's clients in industry k over the square root of total assets of all companies in industry k is greater than 15%, and 0 otherwise. We used 15% as the cut-off point, consistent with the auditor industry specialization studies using Chinese data. To examine the deregulation policy effect, we defined POLICY as a dummy variable that equals one if financial year t is on or after 2015 and 0 otherwise.

Consistent with prior studies, for example, [14,31,32], we included variables that were found to be determinants to audit fees. More specifically, we included client company characteristics such as client company size (SIZE), level of leverage (LEV), having negative earnings (LOSS), return on asset (ROA), current asset over total asset ratio (CATA), inven-

tory over total assets ratio (INV), client asset growth rate (AGROWTH), client's incurrence of significant transactions including merge and acquisition (MA), size of audit firms (TOP) and initial audit engagement (INITIAL). Finally, we also controlled the industry fixed effects. We did not include year-fixed effects because we included POLICY as an indicator variable equal to 1 for observations after 2015. We cannot have POLICY and year-fixed effects in the same regression because of the perfect multicollinearity issue. Although we can still get the result for POLICY with year-fixed effects because the statistical software automatically deletes one year dummy, it is incorrect econometrically.

In addition, the DID model requires the satisfaction of treatment and control groups for the parallel trend. We checked the parallel trend by estimating Equation (2) in years before the implementation of the audit price deregulation policy (the year 2011 to 2014) and years after the implementation of the audit price deregulation policy (the year 2015 to 2018), respectively.

$$AF = \alpha + b \times TREAT + \delta \times CONTROLS + IND\ FIXED + \varepsilon \quad (2)$$

To test whether industry specialists who offer fee discounts maintain audit service effort, we designed our estimation model to test the association between audit fee discounts and audit effort by following Ettredge, et al. [33] and Huang, Raghunandan, Huang and Chiou [22]. Specifically, we used the year 2014 as the benchmark of the pre-POLICY period. We then estimated the coefficients of Equation (1) by using the financial data of the year 2014. Note that we included all the control variables except TREAT, POLICY, and TREAT × POLICY, when we estimated the coefficients of Equation (1). Next, we calculated the expected audit fee by multiplying the coefficients of Equation (1) with the firm's actual values in post-POLICY periods such as 2015, 2016, 2017, and 2018, respectively. Finally, we constructed variable FD to indicate audit fee discounts. FD equals 1 if the actual audit fee is less than the expected audit fee, and 0 otherwise. To test H1a, we used the following model:

$$D\_LAG = \alpha + b1 \times TREAT \times FD + b2 \times TREAT + b3 \times FD + \delta \times D\_Controls + IND\ FIXED + YEAR\ FIXED + \varepsilon \quad (3)$$

The dependent variable is D_LAG, measured as the difference of LAG between the financial year after the POLICY (i.e., 2015, 2016, 2017, 2018) and the baseline year before the POLICY (i.e., 2014). LAG is the logarithm of the days between the audit report issue date and financial year-end. A better proxy for audit effort is audit hour. However, we used LAG to proxy for audit effort instead of audit hours as audit hours are not publicly available. We acknowledge that some studies use LAG to proxy for audit effort [34,35]. However, using LAG to proxy for audit effort should be carried out cautiously as LAG is commonly used to proxy for audit efficiency [36] (we would like to thank the anonymous reviewer for pointing this out). The independent variable of interest is TREAT × FD, the interaction term of TREAT and FD. Control variables are the same as those in Equation (1) but we minus the value of the year 2014 to proxy for the change between the post-POLICY period and the pre-POLICY period, which is the same as the way we construct D_LAG. We also controlled fixed effects such as industry and year. Note that Equation (3) is estimated in the sample period after the POLICY because the variable FD only has value for the post-POLICY period by construction.

Following Firth, et al. [37], we employed the Index of Marketization of China's Provinces (MKTIDX), developed by Fan, et al. [38] of the National Economic Research Institute, to measure the degree of market development in regions where the listed company is located. We followed Firth, Rui and Wu [37] to define the top 10 regions of MKTIDX as more developed markets and other regions as less developed markets. Then, we tested our hypothesis by conducting the above tests in the less and more developed markets, respectively.

4.2. Sample Selection

We commenced with all firms listed on the Shanghai and Shenzhen Stock Exchanges for 2011 to 2018 that are included in the China Securities Markets and Accounting Research

Database (CSMAR). For the audit price regulation period, we selected the year from 2011 to 2014 because NDRC issued a new law in 2010 to further control audit prices. MOF requires relevant government bodies of all provinces to implement the new law strictly [22,23,39]. For the audit price deregulation period, we selected years from 2015 to 2018 as the audit prices deregulating law is effective from 2015 [8]. We stopped our sample in 2018 to avoid the COVID-19 pandemic's influence, which started at the end of the year 2019. We first eliminated 603 observations that were from the financial industry. Then we eliminated 1863 newly listed companies (IPO companies). Also, we eliminated 1401 observations with missing financial data. Our final sample contains 19,261 firm years. We summarize the sample selection process in panel A of Table 2 and present industry distributions in Panel B and Panel C of Table 2. Our sample is distributed similarly to prior studies, for example, [40], in that most firms are from the manufacturing industry, with 11,873 listed firms out of 19,261, nearly 61.6%.

Table 2. Sample selection and distribution.

Panel A Sample Selection		
Initial Observations available from 2011 to 2018		23,128
less: observations in the financial industry		603
less: newly listed companies		1863
less: observations with missing financial data		1401
Final Sample		19,261
Panel B Sample distribution by industry		
Industry	No.	Percent
Agriculture, forestry & fishing	278	1.4%
Mining	509	2.6%
Manufacturing	11,873	61.6%
Utilities	712	3.7%
Construction	519	2.7%
Wholesale trade	1099	5.7%
Transportation	630	3.3%
Lodging	71	0.4%
Information & Technology	1350	7.0%
Real estate	927	4.8%
Services	273	1.4%
Scientific Research	181	0.9%
Facility Management	271	1.4%
Education	45	0.2%
Medicine	77	0.4%
Entertainment	296	1.5%
Textile	150	0.8%
Total		100.0%
Panel C Sample distribution by year		
Year	No.	Percent
2011	1634	8.48%
2012	2139	11.11%
2013	2301	11.95%
2014	2241	11.63%
2015	2327	12.08%
2016	2566	13.32%
2017	2762	14.34%
2018	3291	17.09%
Total	19,261	100%

5. Results and Discussion

5.1. Descriptive Data

Panel A of Table 3 presents the descriptive statistics of variables in the full sample. Generally, our descriptive data are similar to studies using Chinese data [22,41,42]. There are 15.1% of listed firms audited by industry specialists, as indicated by the mean of TREAT. The mean (median) of SIZE is 22.15 (21.99), ROA is 0.04 (0.04), LEV is 0.14 (0.11) and CATA is 0.56 (0.58), which are all comparable. Panel B of Table 3 presents the Pearson correlation results for relationships between the variables. The correlation coefficients are all moderate and reasonable.

Table 3. Panel A: Descriptive statistics for the full sample.

	N	Mean	SD	1st Quartile	Median	3rd Quartile
AF	19,261	13.620	0.657	13.120	13.530	13.960
TREAT	19,261	0.151	0.358	0.000	0.000	0.000
POLICY	19,261	0.568	0.495	0.000	1.000	1.000
FD	10,946	0.588	0.492	0.000	1.000	1.000
LAG	19,261	4.525	0.241	4.419	4.585	4.718
SIZE	19,261	22.150	1.311	21.230	21.990	22.890
ROA	19,261	0.043	0.072	0.016	0.041	0.075
LEV	19,261	0.144	0.137	0.019	0.116	0.231
CATA	19,261	0.563	0.207	0.419	0.577	0.721
LOSS	19,261	0.100	0.300	0.000	0.000	0.000
BM	19,261	1.001	1.052	0.377	0.654	1.192
AGROWTH	19,261	0.158	0.318	0.010	0.089	0.209
INV	19,261	0.151	0.144	0.059	0.114	0.188
MA	19,261	0.787	0.409	1.000	1.000	1.000
TOP	19,261	0.698	0.459	0.000	1.000	1.000
INITIAL	19,261	0.090	0.287	0.000	0.000	0.000
ABSDA	19,158	0.060	0.064	0.018	0.041	0.078
MAO	19,158	0.039	0.193	0.000	0.000	0.000
RES	19158	0.0271	0.163	0.000	0.000	0.000

Panel B: Pearson Correlation Results For Control Variables

	1	2	3	4	5	6	7	8
1. AF	1							
2. TREAT	0.057 ***	1						
3. POLICY	0.203 ***	−0.01	1					
4. FD	−0.444 ***	0.014	.	1				
5. LAG	0.102 ***	0.01	0.162 ***	−0.037 ***	1			
6. SIZE	0.736 ***	0.051 ***	0.134 ***	−0.112 ***	0.055 ***	1		
7. ROA	−0.015 **	0.023 ***	−0.037 ***	0.086 ***	−0.138 ***	0.035 ***	1	
8. LEV	0.191 ***	0.042 ***	−0.077 ***	−0.057 ***	0.041 ***	0.322 ***	−0.314 ***	1
9. CATA	−0.110 ***	−0.041 ***	−0.030 ***	0.074 ***	0.009	−0.144 ***	0.118 ***	−0.267 ***
10. LOSS	−0.024 ***	−0.011	0.022 ***	−0.053 ***	0.107 ***	−0.087 ***	−0.644 ***	0.175 ***
11. BM	0.416 ***	0.030 ***	−0.052 ***	−0.082 ***	0.047 ***	0.640 ***	−0.185 ***	0.436 ***
12. AGROWTH	0.033 ***	0.006	0.047 ***	0.045 ***	−0.025 ***	0.071 ***	0.205 ***	−0.011
13. INV	0.044 ***	0.005	−0.085 ***	0.002	0	0.135 ***	−0.062 ***	0.135 ***
14. MA	0.087 ***	0.003	0.130 ***	−0.013	0.022 ***	0.048 ***	−0.031 ***	0.050 ***
15. TOP	0.188 ***	0.186 ***	0.124 ***	0.043 ***	0.011	0.122 ***	0.034 ***	−0.007
16. INITIAL	−0.017 **	−0.028 ***	−0.017 **	−0.037 ***	0.017 **	−0.004	−0.034 ***	0.015 **

Panel B (continued): Pearson Correlation Results for Control Variables

	9	10	11	12	13	14	15	16
9. CATA	1							
10. LOSS	−0.095 ***	1						
11. BM	−0.071 ***	0.044 ***	1					
12. AGROWTH	0.043 ***	−0.191 ***	−0.053 ***	1				
13. INV	0.503 ***	−0.008	0.242 ***	−0.028 ***	1			
14. MA	0	0.006	0.004	0.083 ***	0.015 **	1		
15. TOP	−0.004	−0.016 **	0.042 ***	0.024 ***	−0.021 ***	0.020 ***	1	
16. INITIAL	0.011	0.036 ***	0.012 *	0.015 **	−0.005	−0.006	−0.022 ***	1

Variable definitions are provided in Appendix A. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed tests), respectively.

5.2. Pricing Strategy of Industry-Specialized Auditors

Table 4 reports the multivariate regression results for our audit fee models in less developed markets. The first and second columns present the results from estimating Equation (2) in periods of pre-policy and post-policy, respectively. In column 1 of Table 4, an insignificant coefficient for TREAT suggests a negligible difference in audit fees between industry specialists and non-industry specialists before the audit price deregulation policy in less developed markets. It indicates that the industry specialists could not capitalize on their expertise and charge audit fee premiums in less developed markets before the policy. More importantly, in column 2, we find evidence of a negative and significant coefficient (p-value < 0.05) for TREAT, suggesting audit fees of industry specialists are significantly lower than non-industry specialists after the audit price deregulation policy in less developed markets. Column 3 directly compares the audit fee change of industry specialists before and after the policy by the interaction term of TREAT and POLICY (TREAT × POLICY). We observe an insignificant coefficient of TREAT × POLICY, which suggests the audit fee change is insignificant. However, at the end of the paper, we find a significant and negative coefficient for TREAT × POLICY when we use the propensity score matched sample. In sum, the results indicate the industry specialist uses a cost-leading strategy to compete in the less developed markets after the policy.

Table 4. Audit fees of industry specialists in less developed markets.

	(1)	(2)	(3)		(4)
VARIABLES	AF	AF	AF		D_LAG
	PRE	POST	DID		
TREAT	−0.031	−0.055 **	−0.028	TREAT	0.011
	(−1.33)	(−2.17)	(−1.20)		(0.38)
POLICY			0.090 ***	FD	−0.016
			(7.40)		(−1.41)
TREAT × POLICY			−0.045	TREAT × FD	0.022
			(−1.41)		(0.65)
SIZE	0.365 ***	0.350 ***	0.357 ***	D_SIZE	0.024 **
	(44.22)	(40.96)	(59.92)		(2.38)
ROA	−0.352 **	−0.469 ***	−0.433 ***	D_ROA	−0.075
	(−2.38)	(−3.31)	(−4.25)		(−0.84)
LEV	−0.121 *	0.065	−0.043	D_LEV	0.017
	(−1.93)	(0.91)	(−0.92)		(0.30)
CATA	0.048	0.011	0.014	D_CATA	0.051
	(0.93)	(0.20)	(0.39)		(1.17)
LOSS	0.051 *	0.026	0.037 *	D_LOSS	0.030 *
	(1.76)	(0.87)	(1.79)		(1.89)
BM	−0.042 ***	−0.027 ***	−0.034 ***	D_BM	−0.009
	(−4.07)	(−2.76)	(−4.71)		(−1.13)
AGROWTH	−0.128 ***	−0.036	−0.061 ***	D_AGROWTH	0.021
	(−4.30)	(−1.63)	(−3.46)		(1.48)
INV	−0.123	−0.342 ***	−0.214 ***	D_INV	−0.120
	(−1.62)	(−3.90)	(−3.70)		(−1.51)
MA	0.071 ***	0.074 ***	0.076 ***	D_MA	−0.003
	(4.31)	(3.72)	(5.92)		(−0.28)
TOP	0.142 ***	0.117 ***	0.133 ***	D_TOP	−0.008
	(9.29)	(6.46)	(11.20)		(−0.54)
INTIAL	−0.002	−0.020	−0.014	D_INITIAL	0.009
	(−0.08)	(−0.83)	(−0.84)		(0.69)
Constant	5.507 ***	5.882 ***	5.663 ***	Constant	0.008
	(30.41)	(30.80)	(43.39)		(0.25)
FE	Yes	Yes	Yes	FE	Yes
Observations	2869	3420	6289	Observations	2735
R-squared	0.584	0.508	0.556	R-squared	0.017

Variable definitions are provided in Appendix A. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels (two-tailed tests), respectively.

Gong, Li, Lin and Wu [5] found that even though audit hours are significantly reduced after merging and acquiring accounting firms, it does not result in reduced audit fees using samples before the policy. Suppose our observed decreased fees are due to passing on the achieved efficiency before the policy, in that case, we should observe an audit fee decrease

with an insignificant change in audit effort. We further check if the decreased audit fees are due to decreased audit effort by estimating Equation (3). As shown in Column 4 of Table 4, the coefficient of TREAT × FD is insignificant, suggesting that the audit effort does not significantly change despite the decreased audit fees. Combined with the audit fees tests previously, our results support that the decrease of audit fees of industry specialists is due to the pass-on of the economy scale achieved before the POLICY rather than the decrease in audit effort.

Table 5 reports the multivariate regression results for our audit fee models in more developed markets. The first and second columns present the results from estimating Equation (2) in periods of pre-policy and post-policy, respectively. We find in column 1 of Table 5 a positive and significant (p-value < 0.05) coefficient for TREAT, suggesting audit fees of industry specialists were significantly higher than other auditors before the audit price deregulation policy. In other words, the industry specialists can capitalize on their expertise and charge audit fee premiums in more developed markets before the policy. These results are consistent with prior findings of the audit firms' differentiation strategy in more developed markets [26].

Table 5. Audit fees of industry specialists in more developed markets.

VARIABLES	(1) AF	(2) AF	(3) AF		(4) D_LAG
	PRE	POST	DID		
TREAT	0.041 **	0.009	0.044 ***	TREAT	0.002
	(2.55)	(0.64)	(2.82)		(0.18)
POLICY			0.095 ***	FD	0.005
			(11.58)		(0.71)
TREAT × POLICY			−0.040 **	TREAT × FD	0.002
			(−2.02)		(0.12)
SIZE	0.425 ***	0.396 ***	0.409 ***	D_SIZE	0.046 ***
	(69.54)	(75.49)	(103.17)		(6.00)
ROA	−0.449 ***	−0.465 ***	−0.502 ***	D_ROA	−0.153 **
	(−3.72)	(−4.97)	(−6.85)		(−2.49)
LEV	−0.168 ***	−0.004	−0.087 **	D_LEV	−0.020
	(−3.43)	(−0.10)	(−2.57)		(−0.55)
CATA	−0.034	−0.065 **	−0.058 **	D_CATA	−0.017
	(−0.92)	(−1.96)	(−2.37)		(−0.57)
LOSS	0.019	0.066 ***	0.043 **	D_LOSS	0.029 **
	(0.74)	(2.90)	(2.55)		(2.43)
BM	−0.024 ***	0.006	−0.009	D_BM	−0.005
	(−2.84)	(0.93)	(−1.63)		(−0.87)
AGROWTH	−0.142 ***	−0.045 ***	−0.070 ***	D_AGROWTH	0.022 **
	(−6.49)	(−3.19)	(−5.95)		(2.55)
INV	−0.077	−0.033	−0.048	D_INV	−0.034
	(−1.42)	(−0.61)	(−1.26)		(−0.78)
MA	0.038 ***	0.042 ***	0.040 ***	D_MA	−0.005
	(3.14)	(3.14)	(4.48)		(−0.74)
TOP	0.142 ***	0.090 ***	0.113 ***	D_TOP	0.005
	(12.20)	(7.94)	(13.92)		(0.42)
INTIAL	−0.045 **	0.023	−0.011	D_INITIAL	0.011
	(−2.44)	(1.26)	(−0.84)		(1.07)
Constant	4.173 ***	4.865 ***	4.504 ***	Constant	−0.011
	(29.55)	(38.59)	(48.41)		(−0.29)
FE	Yes	Yes	Yes	FE	Yes
Observations	5446	7526	12,972	Observations	5382
R-squared	0.643	0.605	0.631	R-squared	0.024

Variable definitions are provided in Appendix A. *** and ** indicate statistical significance at the 0.01 and 0.05 levels (two-tailed tests), respectively.

As audit fees of TREAT are already significantly higher than the control groups, the parallel trend of the DID design for more developed markets is not satisfied. However,

our analysis still reveals some interesting results. In column 2, we find an insignificant coefficient for TREAT, suggesting audit fees of industry specialists are not different from non-industry specialists after the policy. Column 3 directly compares the audit fee of industry specialists before and after the policy by the interaction term of TREAT and POLICY (TREAT × POLICY). We observe a negative and significant (p-value < 0.05) coefficient of TREAT × POLICY, which suggests a substantial audit fee decrease. In sum, the results indicate the industry specialist could not charge an audit fee premium in more developed markets after the policy.

We also checked if the decreased audit fees are due to decreased audit effort by estimating Equation (3). As shown in Column 4 of Table 5, the coefficient of TREAT × FD is insignificant, suggesting that the decreased audit fees are not due to decreased audit effort. Combined with the audit fees tests previously, our results indicate that the decreased audit fees of industry specialists are not due to decreased audit effort. The industry specialist could not maintain their audit fee premium after the policy. This may be due to the increased price competition after the policy.

5.3. Propensity-Score-Matched (PSM) Sample

The choice of an industry-specialized auditor is potentially self-selected, and the factors determining auditor choice can influence the association between AF and TREAT. Thus, we controlled the industry-specialized auditor's self-selection bias by employing a PSM method. We firstly used a logit regression to estimate the probability of having an industry-specialized auditor with TREAT as the dependent variable and include all control variables as in Equation (1). We used the predicted probabilities computed from the auditor choice model to match each client firm audited by an industry-specialized auditor with client firms audited by the non-industry specialized auditor. We used matching with no-replacement and impose a 1 percent maximum distance in the propensity score to exclude firms without a reasonable match in the sample. Using the PSM sample, we re-examined the effect of industry-specialized auditors on the audit fees for the less developed markets as a robustness check for the significant findings. We find our evidence is qualitatively unchanged, as shown in Table 6.

Table 6. Audit fees of industry specialists in less developed markets using psm sample.

VARIABLES	(1) AF	(2) AF	(3) AF		(4) D_LAG
	PRE	POST	DID		
TREAT	0.018	−0.074 **	0.010	TREAT	0.036
	(0.53)	(−2.20)	(0.29)		(1.06)
POLICY			0.080 **	FD	0.013
			(2.38)		(0.46)
TREAT × POLICY			−0.081 *	TREAT × FD	−0.022
			(−1.70)		(−0.52)
CONTROLS	Yes	Yes	Yes	CONTROLS	Yes
FE	Yes	Yes	Yes	FE	Yes
Observations	666	838	1504	Observations	678
R-squared	0.676	0.586	0.622	R-squared	0.082

Variable definitions are provided in Appendix A. ** and * indicate statistical significance at the 0.05 and 0.10 levels (two-tailed tests), respectively.

6. Additional Analysis

Decreased Audit Fees and Audit Quality

While Cahan, Jeter and Naiker [6] find evidence that some industry-specialized auditors charge lower audit fees and provide lower quality audits, Bills, Jeter and Stein [12] find that industry-specialized auditors offer audit price discounts without compromising audit quality. Using audit hours to measure audit efficiency, Gong, Li, Lin and Wu [5] provide evidence that reducing audit hours does not undermine audit quality. Although we find evidence that the decreased audit fees are not out of the reduced audit effort, we

still recognize that our findings may indicate lower audit quality rather than economies of scale for industry-specialized auditors. To address this concern, we performed additional tests to determine whether audit quality differs for industry-specialized auditors in their discounted engagement. We used the following models to test if audit quality is influenced by comparing the audit quality of the industry specialists in the pre-policy period and post-policy period:

$$AQ = \alpha + b \times TREAT \times POLICY + b2 \times TREAT + b3 \times POLICY + \delta \times CONTROLS + IND\ FIXED + \varepsilon \quad (4)$$

Audit quality (AQ) is proxied by three measurements. First, we use the absolute value of discretionary accruals (|DA|) calculated as the residuals from the modified version of the Jones model [34]; Specifically, DA is the regression residuals estimated from the modified version of the model by Jones (1991), which includes changes in accounts receivables (ΔREC) [43]. The OLS regression model for DA is estimated as follows:

$$\frac{TACC_{it}}{TA_{it-1}} = \alpha_1 \left(\frac{1}{TA_{it-1}}\right) + \alpha_2 \left(\frac{\Delta\ REV_{it} - \Delta\ REC_{it}}{TA_{it-1}}\right) + \alpha_3 \frac{PPE_{it}}{TA_{it-1}} + \varepsilon_i \quad (5)$$

where TACC is the total accruals in year t, which is calculated as the difference between operating income and operating cash flow [44], ΔREV is sales growth from t − 1 to t, and PPE is the gross value of fixed assets. All of the variables are scaled by total assets at the beginning of year t (TA) to reduce the possibility of heteroscedasticity. The regression model is estimated cross-sectionally for each industry-year combination.

Second, we use the modified audit opinion (MAO) to proxy for auditor independence [22]; Third, we use the probability of a restatement to proxy for audit quality, as a higher level of audit quality should be associated with a lower probability of restatements [5,14].

The independent variable of interest is TREAT × POLICY, which is the interaction term of TREAT and POLICY. We use the same set of control variables in Equation (1) and additionally include control variables such as the number of years the client has been listed on the stock market (COMAGE) and audit report lag (LAG) to be consistent with prior studies on audit quality, for example, [14].

Table 7 reports the multivariate regression results for our audit quality models in less developed markets. As shown in column 2 of Table 7, the coefficient of TREAT is insignificant after the policy, which indicates that audit quality is not impaired even though industry-specialized auditors have offered audit fee discounts. Column 1 shows the effects of discounted audit fees of TREAT on audit quality before the policy, and we find insignificant results, which is consistent with our expectation as industry specialists did not pursue differentiation strategy in less developed markets. Finally, we include interaction terms of TREAT and POLICY (TREAT × POLICY) to test the audit quality change for industry specialists between the pre-policy and post-policy periods. We find that the TREAT × POLICY coefficient is insignificant, indicating that the audit quality does not significantly change despite the decreased audit fees. We find similar results when we use MAO and RES as a proxy for the audit quality, as shown in columns (4) to (9). Combined with the audit fee tests previously, our results again support that industry specialists could maintain audit quality while giving audit fee discounts, which is consistent with Bills, Jeter and Stein [12] and Gong, Li, Lin and Wu [5].

Table 7. Audit quality of discounted industry specialists in less developed markets.

VARIABLES	(1) ABSDA	(2) ABSDA	(3) ABSDA	(4) MAO	(5) MAO	(6) MAO	(7) RES	(8) RES	(9) RES
	PRE	POST	DDD	PRE	POST	DDD	PRE	POST	DDD
TREAT	0.003	0.003	0.004	0.455	−0.181	0.210	−0.122	−0.563	0.082
	(0.93)	(0.85)	(1.24)	(1.42)	(−0.54)	(0.73)	(−0.40)	(−1.21)	(0.29)
POLICY			−0.002			0.073			−0.285 *
			(−1.17)			(0.48)			(−1.79)

Table 7. *Cont.*

TREAT × POLICY			−0.002			−0.302			−0.970 *
			(−0.40)			(−0.76)			(−1.89)
CONTROLS	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	2863	3381	6244	2736	3129	6016	2747	3194	6188
R-squared	0.117	0.187	0.141	0.326	0.321	0.301	0.0581	0.136	0.0791

Variable definitions are provided in Appendix A. * indicate statistical significance at the 0.10 levels (two-tailed tests), respectively.

7. Conclusions

Our evidence on the competing strategy of audit firms would interest regulators, auditors, and market participants [45–47]. Along with the new deregulation policy, the over 30-year audit price restriction has ended. China has set restrictions on audit fees since the 1980s. Audit price regulation aims to mitigate the price competition so that audit firms could survive more easily at the beginning of the market development [22,23]. However, the audit price regulation has received various criticisms since its enactment. One of the main criticisms is that intervention from the government on audit price could constrain the function of the market mechanism, which may constrain the audit market development. The regulators expect that after the audit price is deregulated, the audit market could develop more per the market regularity. Our study provides evidence to the regulators that the deregulation policy makes the industry specialist more available to the public, which benefits the capital market's development.

Also, The Government Accountability Office (GAO) is concerned that consolidating audit firms from the Big 6 to the Big 5 in 1998 and then from the Big 5 to the Big 4 in 2002 would increase market concentration and decrease the competition [16]. However, it is also possible that this consolidation has either reduced competition and increased prices or created efficiencies that have reduced prices [4]. In its most recent report on this issue, GAO [15] states that "market participants . . . raised concerns that splitting up these firms could reduce their economies of scale (EOS) and the depth of expertise that currently allow the largest firms to effectively and efficiently audit large companies" [15]. Our evidence supports that the industry specialist could compete with their ability of economy of scale to offer lower prices with quality services. This benefit of the audit firms may not be ignored when considering the capital market policies.

Our study also has implications for management; 80% of client firms viewed industry specialization as important in choosing their auditors [15,16]. While there is a long list of studies that have tried to investigate if industry-specialized auditors charge fee premiums and offer high-quality audits [13,14], there is a short list of studies examining when industry-specialized auditors would change their competing strategy. We provide evidence that auditors would utilize their economy of scale to compete in the audit market, particularly in less developed markets. Management could consider the low-price auditors with industry specialists when they choose auditors.

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Appendix A

Variable Definitions	
Name	Definition
AF	The logarithm of the company's total audit fees in the current financial year-end
POLICY	Equals 1 if the financial year is on or after 2015, and 0 otherwise
TREAT	Equals 1 if the ratio of (the square root of total assets of auditor firm's clients in industry k)/(square root of total assets of all companies in industry k) is greater than15%, and 0 otherwise
INITIAL	Equals 1 if the client switch audit firm in year t, and 0 otherwise
FD	Equals 1 if the actual audit fee is lower than the expected audit fees, and 0 otherwise
LAG	The logarithm of the number of days between audit report issue date and financial year-end
SIZE	The logarithm of the company's total assets in the current financial year-end
ROA	Net income over total asset
LEV	Total debts over total assets
CATA	Current assets over total assets
LOSS	Equals 1 if the client firm suffers a loss in the current financial year and 0 otherwise
BM	Book value of equity divided by the market value of equity
AGROWTH	Change of total assets in the current year over the total asset balance at the beginning of the year
INV	The ratio of inventory over total assets
MA	Equals 1 if the client records significant transactions, including merge or acquisition in the year t, and 0 otherwise
TOP	Equals 1 if the audit firm is Big four or Local ten accounting firms and 0 otherwise.
COMAGE	Number of years the client has been listed on the stock market
RES	Equals 1 if the client company recorded restatements in year t, and 0 otherwise.
ABSDA	The absolute value of discretionary accruals estimated from the modified Jones model
MAO	Equals 1 if the client firm receives a modified audit opinion, and 0 otherwise

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