

審計人員之產業專精與客戶租稅規避：中國實證研究

Auditor Industry Expertise and Clients' Tax Avoidance: Evidence from China

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摘要

本研究使用 2008 至 2012 年上海與深圳證券交易所之 A 股上市公司來研究審計人員之產業專精對於客戶租稅規避行為之影響。從審計的角度來看，其產業專精可能會限制租稅規避，因為身為業內專家的審計人員更會基於風險控制的原則而制止租稅規避行為。從稅務的角度來看，其產業專精可能會鼓勵租稅規避，因為業內的專家更會利用自己的專長，提出稅務策略，使客戶受益。本研究發現審計人員之產業專精與企業較多的租稅規避有所關聯，尤其是當審計人員獨立性較低時。結果顯示，當審計人員獨立性較低時，審計人員之產業專精可能較會鼓勵客戶租稅規避，而非抑制租稅規避。本研究建議政策制定者提升審計人員之獨立性的重要性，同時也鼓勵審計人員提升產業專業知識。

【關鍵字】 審計人員產業專精、租稅規避、公費依賴性、審計人員任期

Abstract

Using 2008-2012 A-share listed companies on the Shanghai and Shenzhen Stock Exchange, this paper examines the influence of auditor industry expertise on clients' tax avoidance. From an audit perspective, industry expertise may constrain tax avoidance because industry experts are more likely to find and deter tax avoidance activity based on risk control principle. From a tax perspective, industry expertise may encourage tax avoidance because industry experts can use their expertise to develop tax strategies that benefit clients. We find that auditor industry expertise is associated with a higher level of tax avoidance, especially when auditor independence is lower. This result indicates that in the case of poor auditor independence, auditor industry expertise may encourage clients' tax avoidance instead of constraining it. Our study has implications for policy maker by reminding the importance of improving auditor independence while encouraging auditors to develop industry expertise.

【Keywords】 auditor industry expertise, tax avoidance, fee dependence, auditor tenure

1. Introduction

Corporate tax avoidance is one of the most important regulatory issues that always attract concerns from tax authorities and media. Especially recently, several large American multinationals were investigated because of suspected tax evasion, making tax avoidance the focus of regulation. In September 2012, the U.S. Senate Permanent Subcommittee on Investigations accused Microsoft of evading \$4.5 billion in taxes through bait-and-switch selling with foreign subsidiaries in 2009-2012. Under the exceptions of short term loans in related laws, Hewlett-Packard exempted billions of dollars in taxes through intra-group loans. In May 2013, Apple was accused of evading \$12.5 billion dollars via foreign operations and overseas joint ventures in the past two years. Besides, a number of multinationals were accused by the UK government of reallocating their profits to tax havens. For example, Facebook shifted most of its income to Ireland where the tax burden is lower. Google and Starbucks also have their own tax havens, such as Bermuda and the Cayman islands, and engaged in profit-shifting activities in order to minimize their tax burdens.

Corporate tax planning may not be illegal, but some aggressive tax planning for the purpose of tax avoidance and tax evasion are illegal tax schemes. While lawful tax planning may be a value-maximizing activity that transfers wealth from the state to corporate shareholders, aggressive tax planning (such as tax avoidance and tax evasion) may adversely affect the allocation of tax resources and damage the interests of shareholders via increasing corporate risk or facilitating managerial opportunism, such as earnings manipulation and outright resource diversion (Chen, Chen, Cheng, and Shevlin, 2010; Desai and Dharmapala, 2009).

Although prior research has investigated the level and method of tax avoidance (e.g., Rego, 2003; Dyreng, Hanlon, and Maydew, 2008), many of the determinants of firms' tax avoidance remain unclear, and evidence on the association between external audit firm's industry expertise and tax avoidance is scarce. In fact, it is important to examine the role external audit firms play in corporate tax avoidance, since external audit firms can influence clients' tax avoidance through at least two ways. First, external audit firms constrain tax avoidance through auditing financial statements. Second, these firms help clients reduce tax through providing tax services. The second way has a direct impact on the level of tax avoidance and has attracted authorities' attention since the 1990s. In the 1990s, malicious tax evasion is prevalent in America. All the Big 5 audit firms¹ were involved to varying degrees.

1 The Big 5 means KPMG, Ernst & Young, Deloitte & Touche, Price Waterhouse Coopers and Arthur Anderson.

For example, before the IRS (Internal Revenue Service) defined malicious tax evasion as illegal, Ernst & Young provided this tax service to 132 clients, its competitive tax shelter being contingent deferred swap. The main idea behind this tax-avoidance strategy is shifting operating income to capital gains which has a lower tax ratio. In August 2005, KPMG publicly acknowledged that they had peddled tax shelters to their clients and agreed to pay a fine of \$456 million.

It seems that external audit firms forget their auditing roles when providing tax services to their clients. However, from the perspective of risk control, external auditors should constrain clients' tax avoidance when taking on auditor duties (Maydew and Shackelford, 2007). Overall, the question about auditor's role in clients' tax avoidance activity is still open. This paper investigates the association between auditor industry expertise and clients' tax avoidance and whether this association is affected by auditor independence. Although a number of studies have investigated the influence of auditor industry expertise on audit quality or audit pricing (e.g., Gul, Fung, and Jaggi, 2009; Reichelt and Wang, 2010; Francis, Reichelt, and Wang, 2005), evidence on the association between auditor industry expertise and tax avoidance is scarce. It is not clear whether auditor industry expertise is associated with greater tax avoidance, because auditor industry expertise influences tax avoidance from both tax and audit perspectives. From a tax perspective, industry experts are associated with greater tax avoidance because experts have a better understanding of industry-specific opportunities for avoiding tax, and may use their expertise to develop tax strategies that benefit clients. From an audit perspective, due to the complexities of tax laws and risk control principles, industry experts are more likely to find and deter tax avoidance activity by requiring adjustments that limit the associated financial statement benefits.²

The purpose of this paper is to examine the influence of auditor industry expertise on tax avoidance. Considering the intense competition in the Chinese audit market, this study further investigates whether the association between auditor expertise and tax avoidance is affected by auditor independence. Using 2008-2012 A-share listed companies in Shanghai and Shenzhen Stock Exchange as research sample, this paper demonstrates that an auditor who is an industry expert is more likely to help its client engage in tax avoidance activity,

2 For example, some tax avoidance activities (such as creating a permanent difference to reduce tax expense) will attract auditor's attention, especially when the auditor is an industry expert. If the auditor does not believe the tax strategy will withstand the scrutiny of the relevant tax authorities, he/she may require the client to adjust the accounting process and therefore reduce tax avoidance.

especially when there is higher fee dependence or longer auditor tenure. This result indicates that in the case of poor auditor independence, auditor industry expertise may encourage clients' tax avoidance instead of constraining it.

Our study contributes to the existing literature in three ways. First, our evidence facilitates a better understanding of auditor industry expertise. Prior research mainly focused on the influence of industry expertise on audit quality or audit pricing. Our study extends these studies by providing evidence on the association between auditor industry expertise and tax avoidance. Although auditor industry expertise may enhance both the tax consulting role and auditing role in theory, our evidence suggests that the tax consulting role of industry expert may dominate.

Secondly, this paper further investigate the influence of auditor independence, and suggest that poor auditor independence (proxied by fee dependence and auditor tenure) may enhance the association between auditor industry expertise and tax avoidance. This finding not only extends prior audit research, but also has implications for policymakers. They should be aware that although encouraging audit firms to develop industry expertise is good for improving audit quality and audit pricing, poor auditor independence may induce industry expert to help client engage in tax avoidance activity. Therefore, the risk of both audit firms and their clients is increased.

Thirdly, our evidence adds to the growing literature on the determinants of corporate tax avoidance. Prior research mainly focused on corporate characteristics such as tax ratio, boards of directors, and executive incentives (e.g., Dyreng, Hanlon, and Maydew, 2010; Robinson, Sikes, and Weaver, 2010; Rego and Wilson, 2012). Our study extends existing research by considering an additional party to tax avoidance—the audit firm. Through the discussion of audit firm's dual role in tax avoidance, this study established an association between auditor industry expertise and tax avoidance and demonstrated that industry expert is associated with greater tax avoidance.

The remainder of the paper is as follows. Section 2 discusses prior related research and hypothesis development. Section 3 describes our measure of tax avoidance and auditor industry expertise in detail and the regression models. Section 4 provides a description of our sample, tests, and results. Section 5 concludes this paper.

2. Literature Review and Hypothesis Development

2.1 Auditor Industry Expertise

Auditor industry expertise is an important factor of auditor professional competence and is emphasized by many auditing standards.³ The AICPA (American Institute of Certified Public Accountants) even issued specific auditing guidance for specific industry and further emphasized the importance of developing industry expertise in audit quality control guidelines. Chinese auditing standards also highlighted the importance of auditor industry expertise. For example, “Specific Independent Audit Guideline No. 1” (MOF, 1995) requires CPAs to acquire knowledge concerning the clients’ business, operations, and risks and conduct audit procedures based on in-depth industry knowledge.

Besides the requirements of auditing standards, the incentive for audit firm industry specialization also comes from market strategy. In a highly competitive audit market, audit firm industry specialization is one of the two important differentiation strategies (the other one is brand name), which allows audit firms to differentiate themselves from competitors in fulfilling clients’ demands, and enables audit firms to compete on characteristics other than price alone (Mayhew and Wilkins, 2003). Meanwhile, industry specialization helps audit firms improve audit efficiency through economics of scale, create barriers to entry by requiring new entrants to invest significant resources in relevant industry, and affect client-relevant outcomes like audit fee and audit quality (Dunn and Mayhew, 2004). Previous literature demonstrated that industry expertise can bring audit firms more fee premiums and industry specialization is an efficient strategy to gain market share (Francis et al., 2005).

In fact, many big audit firms have restructured industry service lines and developed industry expertise by investing time and financial resources in specific industries since 1990s. The Big 4 have their own specialized industries based on market share in 1990s: Ernst and Young in the automobile and computer industries; KPMG in banks and insurance companies; Price Waterhouse in computers, mining, and telecommunications; Arthur Andersen in hotels, telecommunications, and utilities; and Coopers and Lybrand in telecommunications (De Beelde, 1997).

In China, the audit market is somewhat different from developed countries. It is competitive rather than oligopolistic, and there is increasing competition between local

3 For example, International Standards on Auditing No. 315 (IFAC, 2009) indicates that auditors must have in-depth industry knowledge of the regulations, business risks, and related external factors.

Chinese CPA firms and foreign firms (Wang, Sewon, and Claiborne, 2008). Foreign accounting firms have been allowed to establish joint ventures with local practitioners to perform financial statement audits since 1992. From then on, the Big 4 entered and gradually gained dominance in China's audit market.⁴ In order to improve the competitiveness of local Chinese CPA firms over foreign firms, Chinese regulators⁵ issued a series of policies and guidelines to make local CPA firms bigger and stronger, and encourage local firms to develop their industry expertise.⁶ These policies greatly promoted mergers and reorganizations of local CPA firms and provided opportunities for the development of industry expertise. After several years of effort, recent studies (e.g., Han and Chen, 2008) assumed that Chinese CPAs have developed auditor industry expertise.

2.2 Auditor Industry Expertise and Audit Quality

Audit quality is affected by both auditor independence and auditor professional competence, and industry expertise is an important embodiment of professional competence (De Angelo, 1981). Auditor industry expertise, including industry-specific knowledge and experiences, helps auditors improve professional judgment and audit efficiency, thus improving audit quality. Previous evidence from developed countries is consistent with this assumption. O'Keefe, King, and Gaver (1994) demonstrated that industry experts are more likely to follow auditing standards than non-experts; Owosho, Messier, and Lynch (2002) found a negative association between auditor industry expertise and financial report frauds; Krishnan (2003) and Burnett, Cripe, Martin, and McAllister (2012) indicated that auditor industry expertise can constrain clients' earnings management. All these literatures suggested a positive association between auditor industry expertise and audit quality.

However, the influence of auditor industry expertise on audit quality is not that clear in the emerging market. Some studies even came to the opposite conclusion. For example, based on the 2000-2003 Chinese B-share market, Chen, Su, and Wu (2007) argues that industry specialization (proxied by market power) is positively associated with audit pricing

4 During the period 2006–2012, the Big 4 audit firms gained an average of 58.33% market share of A-share listed companies, while the top 10 local audit firms in China gained only 24.47% market share.

5 MOF (Ministry of Finance), CICPA (The Chinese Institute of Certified Public Accountants), and CSRC (China Securities Regulatory Commission).

6 Such as “Rules on Financial Audit for State-Owned Enterprises” (SASAC, 2004) issued by CSRC and MOF, “Guidelines for accelerating the development of CPA industry” (SASAC, 2009) issued by MOF, and “Policies of making Chinese accounting firms bigger and stronger” (CICPA, 2012).

and audit quality. But Cai and Xian (2007), using 2001-2004 A-share listed Chinese companies, found that auditor industry expertise cannot improve audit quality because of poor auditor independence. The mixed results from the two prior studies may be due to different samples and research designs, but one possible explanation is that the association between auditor industry expertise and audit quality is affected by the degree of market competition and auditor independence. Since the competition in China's audit market is fiercely high and the demand for audit quality is relative low, audit firms need to compete on price or compromise independence to retain clients. The positive effect of industry expertise on audit quality is offset by poor auditor independence.

2.3 Auditor Industry Expertise and Clients' Tax Avoidance

Auditor industry expertise may constrain or encourage clients' tax avoidance activity. From the audit perspective, industry experts are more likely to find and deter tax avoidance activity by requiring adjustments. Prior research suggests that tax expense is difficult for auditors to evaluate because of the complexity of the tax laws and that the substantial judgment that must be exercised in estimating the various components of tax expense (Dhaliwal, Gleason, and Mills, 2004). Industry experts can use their industry-specific knowledge and experience to improve professional judgment and the efficiency of collecting audit evidence. Therefore, compared to non-industry experts, industry experts are more likely to find clients' tax avoidance activity and require adjustments to limit it based on risk control principle. This leads to our first hypothesis:

H1: *Ceteris paribus*, auditor industry expertise is negatively associated with clients' tax avoidance.

From the tax perspective, industry expert is associated with greater tax avoidance because experts have a better understanding of industry-specific opportunities for tax planning and may use their expertise to develop tax strategies that benefit clients. While some research suggests that the use of auditor-provided tax services declined after the passage of the Sarbanes-Oxley Act (Maydew and Shackelford, 2007), Cook and Omer (2010) find that approximately two-thirds of the corporations in their sample continue to purchase at least a portion of their tax consulting services from their external audit firm. Thus, for many clients, their tax avoidance activity is directly affected by tax consultants and indirectly affected by auditors. McGuire, Omer, and Wang (2012) find that both external audit firm's tax expertise and overall expertise are positively associated with its clients' tax

avoidance, which indicates that industry experts are more likely to use their expertise to develop tax strategies that benefit clients. Since the expertise developed in the specific industry can help auditors find more tax avoidance opportunities and develop more efficient tax avoidance strategies, our second hypothesis predicts:

H2: Ceteris paribus, auditor industry expertise is positively associated with clients' tax avoidance.

The audit market in China is different from that of developed countries. On one hand, competition among auditors is more pronounced in China due to active participation of small- and medium-sized CPA firms and low concentrations of Big 4 auditors (Wang et al., 2008). On the other hand, as an emerging-market and transitional country, China's legal system is not perfect; legal protection for investors is poor and the litigation risk of auditors is lower as compared to the U.S. Therefore, auditors are more likely to compromise their independence for economic incentives in the Chinese setting, due to higher benefits (to gain and maintain market share) and lower costs (litigation costs associated with independence impairment). Based on this assumption, we predict that auditors are more likely to use their industry-specific knowledge to help their clients evade tax in case of poor auditor independence.

A line of research, starting with De Angelo (1981), suggested that an auditor's incentive to compromise independence relates to the economic significance of client fees. Stanley and DeZoort (2007) provides further support for this argument by demonstrating that the more economically dependent the auditor is on the client, the more likely the auditor is to succumb to client pressure, and the audit quality is lower. Besides fee dependence, auditor tenure is another determinant of auditor independence. Hoyle (1978) finds a negative association between auditor tenure and audit quality. He argues that, because of economic bonds and close relationships, auditors are more likely to acquiesce to clients' wishes in a longer tenure. Based on these researches, this study uses fee dependence and auditor tenure to proxy auditor independence and predicts that auditor industry expertise will be more positively associated with tax avoidance when there is poor auditor independence. This leads to our third hypothesis:

H3: As fee dependence or auditor tenure increases (which represents poor auditor independence), clients' tax avoidance increases with their auditors' industry expertise.

3. Research Design

3.1 Measure of Auditor Industry Expertise

Prior research suggests that external audit firms with large market shares are more likely to be industry experts (De Angelo, 1981) because they are able to increase their knowledge through significant investments in industry-specific training and from experience gained through providing services to a large number of clients (Mayhew and Wilkins, 2003). This study uses the method developed by Krishnan (2003) to measure auditor industry expertise: one proxy is IMS (Industry Market Shares), and the other one is IPS (Industry Portfolio Shares). This study sets continuous variables and dummy variables based on the following calculations:

$$IMS_{ik} = \sum_{j=1}^J REV_{ikj} / \sum_{i=1}^I \sum_{j=1}^J REV_{ikj}$$

where REV is sales revenue, and the numerator is the sum of sales of all J_{ik} clients of audit firm i in industry k . The denominator is the sales of J_{ik} clients in industry k summed over all I_k audit firms in the sample with clients (J_{ik}) in industry k . To estimate industry market share for each auditor, this study requires a minimum of five audit firms for each CSRC⁷ (China Securities Regulatory Commission) industry code and calendar year. We also set a dummy variable IMS_D , which equals 1 when $IMS_{ik} \geq 10\%$ and 0 if not. $IMS_D = 1$ means audit firm i is an expert in industry k .

Following Krishnan (2003), we estimate auditor portfolio share as follows:

$$IPS_{ik} = \sum_{j=1}^J REV_{ikj} / \sum_{k=1}^K \sum_{j=1}^J REV_{ikj}$$

where REV is sales revenue and the numerator is the sum of the sales of all J_{ik} clients of audit firm i in industry k . This study uses CSRC codes to identify industry categories. The denominator is sales of all clients of audit firm i summed over all k industries. The dummy variable IPS_D equals 1 when IPS_{ik} is the highest in the portfolio of audit firm i and equals 0 if not.

7 The industry code is one-digit except manufacturing industry which is two-digit.

3.2 Measures of Tax Avoidance

Consistent with Dyreng et al. (2008, 2010), this study defines tax avoidance as a strategy that reduces a firm's tax liabilities. To proxy for firms' tax avoidance activities, this study first estimates firms' book and cash effective tax rates:

$BETR = \text{current income tax expense/pre-tax accounting income less special items};$

$CETR = \text{cash taxes paid/pre-tax accounting income less special items}.$

The book effective tax rate, *BETR*, is defined as total tax expense divided by pre-tax book income less special items over a one-year period.⁸ *BETR* is a widely-used measure of a firm's tax burden and reflects tax avoidance activities that directly affect net income, but not those activities that defer cash taxes paid to a later period (Hanlon and Heitzman, 2010). A low value of *BETR* can reflect an increased level of tax avoidance (e.g., Rego, 2003). This study measures *CETR* (Cash Effective Tax Rate) over a one-year period and defines it as cash taxes paid divided by pre-tax book income less special items (Dyreng et al., 2008, 2010). Unlike *BETR*, *CETR* can reflect tax avoidance strategies that defer cash taxes paid to later periods, but do not affect the tax expense on the financial statement. Like *BETR*, lower values of *CETR* represent higher levels of tax avoidance.

This study then estimates book-tax differences (*BTD*) following the method developed by Wilson (2009):

$BTD = \text{pre-tax book income less special items-taxable income}.$

where taxable income is defined as current income tax expense divided by statutory tax rate. *BTD* reflects tax avoidance activities that generate both permanent and temporary differences between financial income and taxable income. Previous studies indicate that *BTD* is positively associated with the probability of tax sheltering (Wilson, 2009). Accordingly, unlike *BETR* and *CETR*, larger values of *BTD* represent higher levels of tax avoidance.

3.3 Regression Models

Following prior tax avoidance model (Dyreng et al., 2008, 2010; Wilson, 2009), this study examines the influence of auditor industry expertise on tax avoidance after controlling for the effects of audit firm size, client size, client ownership type, client's performance, industry, and year. This study estimates the OLS regression model as follows:

8 *BETR*s with negative denominators are deleted. The remaining non-missing *BETR*s are winsorized (reset) at the 1st and 99th percentiles.

$$BETR = \beta_0 + \beta_1 Spec + \beta_2 Fee + \beta_3 Tenure + \beta_4 Spec * Fee + \beta_5 Spec * Tenure + \beta_6 Big10 + \beta_7 Soe + \beta_8 Size + \beta_9 ROA + \beta_{10} Lev + \beta_{11} CFO + Year + IND + \varepsilon \quad (1)$$

$$CETR = \beta_0 + \beta_1 Spec + \beta_2 Fee + \beta_3 Tenure + \beta_4 Spec * Fee + \beta_5 Spec * Tenure + \beta_6 Big10 + \beta_7 Soe + \beta_8 Size + \beta_9 ROA + \beta_{10} Lev + \beta_{11} CFO + Year + IND + \varepsilon \quad (2)$$

$$BTD = \beta_0 + \beta_1 Spec + \beta_2 Fee + \beta_3 Tenure + \beta_4 Spec * Fee + \beta_5 Spec * Tenure + \beta_6 Big10 + \beta_7 Soe + \beta_8 Size + \beta_9 ROA + \beta_{10} Lev + \beta_{11} CFO + Year + IND + \varepsilon \quad (3)$$

where tax avoidance is measured by *BETR*, *CETR* and *BTD*, and auditor industry expertise (*Spec*) is measured by *IMS*, *IMS_D*, *IPS* and *IPS_D*. We also use fee dependence and auditor tenure to proxy for auditor independence. Fee dependence (*Fee*) is measured by the ratio of a particular client’s total fees given over all total fees received by the audit firm during a one-year period. This proxy can capture the relative significance of a client’s total fees to the fee revenue received by the auditor, as a measure to capture economic bonding between the auditor and the clients (Stice, 1991). Auditor tenure is measured by the length of the auditor–client relationship (Myers, Myers, and Omer, 2003; Ghosh and Moon, 2005). Prior research suggests that longer auditor tenure represents poor auditor independence (Hoyle, 1978). All variables are defined in table 1.

Table 1 Variable Measurement

Measures of Tax Avoidance (<i>Tax-avoidance</i>)	
<i>BETR</i>	= current income tax expense divided by pre-tax accounting income less special items. <i>ETRs</i> with negative denominators are deleted.
<i>CETR</i>	= cash taxes paid divided by pre-tax accounting income less special items. <i>ETRs</i> with negative denominators are deleted.
<i>BTD</i>	= the natural log of absolute value of pre-tax book income less taxable income
Measures of Auditor Industry Expertise (<i>Spec</i>)	
<i>IMS</i>	= the sum of sales of all J_{ik} clients of audit firm i in industry k divided by the sales of J_{ik} clients in industry k summed over all I_k audit firms in the sample with clients (J_{ik}) in industry k
<i>IMS_D</i>	= 1 when $IMS_{ik} \geq 10\%$, otherwise 0.
<i>IPS</i>	= the sum of the sales of all J_{ik} clients of audit firm i in industry k divided by the sales of all clients of audit firm i summed over all k industries.
<i>IPS_D</i>	= 1 when IPS_{ik} is the highest in the portfolio of audit firm i , otherwise 0.
Measures of Auditor Independence	
<i>Fee</i>	= the ratio of a particular client’s total fees given all total fees received by the audit firm.
<i>Tenure</i>	= the length of the auditor–client relationship

Control Variables	
<i>Big10</i>	= 1 when the audit firm is the top 10 based on revenue according to the CICPA's top 100 audit firm list, otherwise 0.
<i>Soe</i>	= 1 for state-owned firms and zero otherwise.
<i>Size</i>	= the natural log of total assets
<i>Roa</i>	= the ratio of net income over total assets
<i>Lev</i>	= the ratio of total net income over total assets
<i>CFO</i>	= cash flow from operations scaled by the beginning total assets

4. Data and Discussion of Empirical Results

4.1 Sample Selection Process

We use all A-share listed companies on the Shanghai and Shenzhen Stock Exchange as our initial sample, which consists of 10,272 firm-years for fiscal years 2008-2012. This study excludes some observations based on the following sample selection criteria: (1) exclude financial companies; (2) firm-years with negative or missing values of income tax expense; (3) firm-years with negative or missing values of equity; (4) industry-years with auditors less than five and auditor-years with clients less than five;⁹ (5) firm-years with missing values of audit fee or audit tenure; (6) firm-years with missing values of control variables. The final sample usable for the study is 7,692 firm-years, with complete information on all variables. This study collects the financial information from the China Stock Market and Accounting Research (CSMAR) database. This study hand-collects audit fee, audit tenure, and tax rate from annual financial reports of listed companies. Table 2 reports the sample selection process:

Table 2 Sample Selection Process

Initial sample for fiscal year 2008-2012	10272
Less: the financial companies	(226)
Less: firm-years with negative or missing values of income tax expense	(149)
Less: firm-years with negative or missing values of equity	(964)
Less: industry-years with auditors less than five and auditor-years with clients less than five	(196)
Less: firm-years with missing values of audit fee or audit tenure	(103)
Less: firm-years with missing values of control variables	(842)
Equals: final sample	7692

⁹ Because if the industry-years and auditor-years are too few, the measurement error of auditor industry expertise will be large.

4.2 Descriptive Statistics

Table 3 provides descriptive statistics for all the variables included in the regression model. With respect to tax avoidance variables, this study uses three measures: *BETR*, *CETR*, and *BTD*. The mean (median) value of *BETR* is 0.1932 (0.1802), the mean (median) of *CETR* is 0.2614 (0.2836) and the mean (median) of *BTD* is 17.1185 (17.1277). Both the mean and median values of tax avoidance variables show that the level of listed Chinese companies' tax avoidance is relative high. Among the auditor industry expertise variables, Table 3 shows that the mean (median) value of *IMS* is 0.0491 (0.0257) and the mean (median) value of *IPS* is 0.0978 (0.0552). This indicates that the level of audit firms' industry specialization is still low based on industry market share and industry portfolio share. The mean values of *IMS_D* and *IPS_D* are 0.1301 and 0.0980, which means that 13.01% and 9.8% of our observations are audited by industry experts. Both the continuous variables and dummy variables show that a small proportion of auditors have developed industry expertise in the Chinese setting. Descriptive statistics of control variables are basically consistent with previous studies.

Table 3 Descriptive Statistics

Variables	Observations	Mean	Std	Min	Median	Max
<i>BETR</i>	7692	0.1932	0.0101	0	0.1802	0.7750
<i>CETR</i>	7692	0.2614	0.0120	0	0.2836	0.5487
<i>BTD</i>	7692	17.1185	3.3688	0.8663	17.1277	25.1400
<i>IMS</i>	7692	0.0491	0.0043	0	0.0257	0.8224
<i>IMS_D</i>	7692	0.1301	0.1132	0	0	1
<i>IPS</i>	7692	0.0978	0.0112	0.0200	0.0552	0.9434
<i>IPS_D</i>	7692	0.0980	0.0884	0	0	1
<i>Fee</i>	7692	0.0303	0.0064	0.0001	0.0121	0.9998
<i>Tenure</i>	7692	3.3796	7.9234	1	2	16
<i>Big10</i>	7692	0.4610	0.2485	0	0	1
<i>Soe</i>	7692	0.4303	0.2452	0	0	1
<i>Size</i>	7692	21.6551	1.8245	13.0760	21.5126	28.2821
<i>Roa</i>	7692	0.0518	0.0080	-0.4984	0.0479	0.9797
<i>Lev</i>	7692	0.4411	0.0514	0.0071	0.4407	0.9897
<i>CFO</i>	7692	0.0463	0.0089	-0.4795	0.0454	0.9601

Table 4 reports the descriptive statistics of auditor industry expertise based on industry market share (*IMS*). This study finds that the highest audit firm market share in most of these

industries is more than 20%, which means that some large audit firms have developed their own industry expertise. For example, KPMG has about 50% market share in the Mining (B) industry; Price Waterhouse Coopers has about 40% market share in IT (G) and 25% in

Table 4 Auditor Industry Expertise Based on Market Share

Industry Code	Industry Name	2008		2009	
		Audit Firm	Market Share	Audit Firm	Market Share
A	Agriculture, forestry, livestock farming, fishery	ShineWing	18.69%	ShineWing	19.24%
B	Mining	KPMG	52.78%	KPMG	51.02%
C0	Food & Beverage	ShineWing	16.25%	ShineWing	15.02%
C1	Textiles & Apparel	Lixin	28.99%	Lixin	29.81%
C2	Timber & Furnishings	Nanjing Lixin	55.13%	Nanjing Lixin	54.70%
C3	Paper & Printing	DDT	26.09%	DDT	24.60%
C4	Petrochemicals	KPMG	18.67%	KPMG	16.99%
C5	Electronics	Guangdong Dahua	30.25%	BDO Dahua	25.66%
C6	Metals & Non-metals	Ernst & Young	28.06%	Ernst & Young	14.25%
C7	Machinery	Ernst & Young	15.89%	DDT	15.44%
C8	Pharmaceuticals	Pan-China	11.01%	Pan-China	13.25%
C9	Other manufacturing	Shanghai Zhonghua	43.50%	Shanghai Zhonghua	42.67%
D	Utilities	PwC	38.48%	PwC	36.55%
E	Construction	DDT	41.62%	PwC	31.54%
F	Transportation	PwC	17.20%	PwC	25.07%
G	IT	PwC	46.02%	PwC	40.97%
H	Wholesale and retail trade	Lixin	9.28%	Pan-China	24.81%
J	Real estate	KPMG	19.88%	KPMG	18.29%
K	Social Services	Lixin	16.29%	RSM	14.24%
L	Communication and Cultural Industry	Dahua	19.32%	Pan-China	18.59%
M	Comprehensive	Lixin	17.08%	Lixin	14.30%

Note: only reports the market share of audit firms with the highest industry market share.

Transportation (F); and Lixin has about 30% market share in Textiles & Apparel (C1). However, this study also noticed that the global Big 4 are industry experts in about half of all 21 industries, while only a few local Chinese audit firms have developed industry expertise based on market share.

2010		2011		2012	
Audit Firm	Market Share	Audit Firm	Market Share	Audit Firm	Market Share
ShineWing	17.75%	ShineWing	19.92%	Dahua	19.33%
KPMG	51.09%	KPMG	50.06%	KPMG	82.24%
ShineWing	14.86%	Sichuan Huaxin	25.29%	Sichuan Huaxin	24.81%
Lixin	27.54%	Lixin	30.15%	Lixin	35.07%
Nanjing Lixin	43.55%	Guangdong Zhengzhong	22.97%	Lixin	46.71%
RSM	37.84%	RSM	34.56%	RSM	32.37%
KPMG	16.06%	KPMG	14.23%	Lixin	11.32%
BDO Dahua	21.62%	Dahua	20.81%	Dahua	21.87%
RSM	11.90%	Lixin	10.67%	DDT	15.25%
DDT	18.18%	DDT	21.67%	DDT	26.04%
Lixin	15.85%	Lixin	21.07%	Ernst & Young	20.12%
Shanghai Zhonghua	42.47%	Ernst & Young	46.09%	Shanghai Zhonghua	22.61%
PwC	34.81%	PwC	36.27%	KPMG	28.71%
DDT	48.93%	DDT	41.43%	Zhongshen Yatai	21.60%
PwC	28.35%	PwC	27.88%	PwC	21.42%
PwC	33.28%	PwC	34.83%	PwC	36.73%
Pan-China	26.37%	Dahua	22.12%	Dahua	20.52%
KPMG	14.57%	KPMG	17.26%	KPMG	19.39%
Dahua	32.20%	Daxin	28.93%	Union Power	23.32%
Pan-China	18.32%	Lixin	20.49%	ShineWing	14.70%
Lixin	26.83%	RSM	16.13%	Lixin	26.77%

Table 5 reports the descriptive statistics of auditor industry expertise based on industry portfolio share (*IPS*). *IPS* can reflect the key industries in audit firms' business portfolio. Table 5 reports the top 10 audit firms' specialist industry with highest portfolio share. Auditor industry expertise based on *IPS* in Table 5 is basically consistent with *IMS* in Table 4. For example, the key industry in DDT's business portfolio is construction (E) and the key industry in RSM's business portfolio is Metals & Non-metals (C6), which is almost the same as that measured by *IMS*. However, compared to auditor industry expertise based on *IMS*, audit firms' specialist industry is not that stable. For example, the specialist industry of PwC was Mining (B) before 2011 based on *IPS*, but it changed to IT (G) in 2012. The specialist industry of local Chinese audit firms based on portfolio share has also been frequently changed in 2008-2012. This may be due to the intense competition in the Chinese audit market, which is not conducive to develop local Chinese audit firms' industry expertise.

Table 5 Auditor Industry Expertise Based on Portfolio Share

Audit Firm	2008		2009		2010		2011		2012	
	Specialist Industry	Portfolio Share	Specialist Industry	Portfolio Share	Specialist Industry	Portfolio Share	Specialist Industry	Portfolio Share	Specialist Industry	Portfolio Share
PwC	B	50.36%	B	40.26%	B	45.79%	B	45.65%	G	14.95%
DDT	E	44.91%	E	50.63%	E	45.17%	E	45.46%	C7	34.60%
RSM ¹⁰	C6	44.91%	C6	32.04%	C6	31.03%	C6	20.82%	C7	22.54%
Kunitomi Hiroka	C4	10.96%	C6	36.15%	C6	36.47%	C6	14.11%	E	31.30%
Ernst & Young	C6	31.40%	E	22.75%	C7	14.19%	E	20.27%	E	35.69%
Lixin	C6	29.48%	C6	26.51%	C6	22.69%	C6	21.51%	H	20.11%
KPMG	B	68.45%	B	67.66%	B	76.14%	B	74.12%	B	84.78%
Daxin	C4	21.87%	E	17.96%	C4	19.10%	C4	16.10%	J	15.20%
Pan-China	C6	21.94%	H	29.13%	H	22.46%	H	19.94%	C7	23.04%
Shine-Wing	B	20.51%	C6	20.90%	G	22.46%	C7	18.74%	G	11.85%
Dahua	C0	10.52%	C6	32.32%	K	57.05%	H	48.81%	E	32.21%

Note: only reports the highest *IPS* of top 10 audit firms based on CICPA's top 100 audit firms list in 2013.

10 RSM merged with Kunitomi Hiroka in 2013, and renamed Ruihua accounting firm, the combined revenue in 2012 is ranked third in CICPA's top 100 list.

Table 6 reports the univariate analysis results. Panel A uses *IMS_D* to identify industry expert. It shows both *BETR* and *CETR* are statistically lower amongst the industry expert auditors than those of non-expert auditors from both t-test and Wilcoxon rank-sum test, and *BTD* of industry experts' clients is statistically higher than that of non-experts' clients, which means the level of corporate tax avoidance is higher when auditor is an industry expert. Panel B uses *IPS_D* to identify industry expert and demonstrates the same results. Overall, Table 6 implies a strong relationship between the auditor industry expertise and clients' tax avoidance. However, this study needs further analysis to confirm this association, because univariate analysis only uses the dummy variables to proxy auditor industry expertise and does not consider other determinants of tax avoidance aside from auditor industry expertise.

Table 6 Univariate Analysis

Panel A: Use industry market share (<i>IMS_D</i>) to identify industry expert								
	Mean				Median			
	Expert (N = 1001)	Non-expert (N = 6691)	Dif	T-stat	Expert (N = 1001)	Non-expert (N = 6691)	Dif	Z-stat
<i>BETR</i>	0.1860	0.1942	-0.008**	-2.43	0.1799	0.1817	-0.002*	-1.89
<i>CETR</i>	0.2605	0.2673	-0.007*	-1.82	0.2802	0.2836	-0.003*	-1.92
<i>BTD</i>	17.8828	17.0053	0.877***	14.21	17.7728	17.0558	0.717***	12.17
Panel B: Use industry market share (<i>IPS_D</i>) to identify industry expert								
	Mean				Median			
	Expert (N = 754)	Non-expert (N = 6938)	Dif	T-stat	Expert (N = 754)	Non-expert (N = 6938)	Dif	Z-stat
<i>BETR</i>	0.1925	0.1995	-0.007*	-1.82	0.1798	0.1861	-0.006***	-2.78
<i>CETR</i>	0.2598	0.2755	-0.016***	-3.72	0.2822	0.2987	-0.017***	-3.36
<i>BTD</i>	17.3957	17.0883	0.307***	4.37	17.3384	17.1080	0.230***	3.61

Note: This table reports the univariate analysis results. The sample includes 7,692 firm-year observations for the period 2008-2012. Panel A uses *IMS_D* to identify industry expert and examines the difference of clients' tax avoidance between industry expert sample and non-expert sample through t-test and Wilcoxon rank-sum test. Panel B uses *IPS_D* to identify industry expert and also examines the difference of clients' tax avoidance between two independent samples. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5% and 10% respectively.

4.3 Multivariate Regression Analysis

Table 7 reports the OLS regression results of auditor industry expertise on tax avoidance. This study uses *BETR*, *CETR*, and *BTD* to measure tax avoidance, and *IMS*, *IMS_D*, *IPS* and *IPS_D* as proxies for auditor industry expertise in Model (1), (2), and (3). Table 7 suggests that auditor industry expertise (*Spec*) based on industry market share (*IMS* and *IMS_D*) is negatively associated with *BETR* and *CETR* in most of these regressions and positively associated with *BTD*. This result indicates that auditors who are industry experts

Table 7 Association between Auditor Industry Expertise and Tax Avoidance

Variables	(1) Tax-avoidance = <i>BETR</i>				(2) Tax-avoidance = <i>CETR</i>	
	<i>Spec</i> = <i>IMS</i>	<i>Spec</i> = <i>IMS_D</i>	<i>Spec</i> = <i>IPS</i>	<i>Spec</i> = <i>IPS_D</i>	<i>Spec</i> = <i>IMS</i>	<i>Spec</i> = <i>IMS_D</i>
<i>Constant</i>	-0.0834*** (-4.03)	-0.0789*** (-3.86)	-0.0681*** (-3.32)	-0.0671*** (-3.30)	-0.2007*** (-8.65)	-0.1889*** (-8.23)
<i>Spec</i>	-0.0743*** (-3.82)	-0.0142*** (-4.01)	-0.0046 (-0.39)	-0.0005 (-0.13)	-0.0571*** (-2.61)	-0.0019 (-1.23)
<i>Big10</i>	-0.0054** (-2.25)	-0.0063*** (-2.73)	-0.0093*** (-4.14)	-0.0092*** (-4.15)	-0.0041 (-1.52)	0.0014 (0.55)
<i>Soe</i>	0.0031 (1.29)	0.0031 (1.29)	0.0029 (1.22)	0.0029 (1.23)	0.0044* (1.67)	0.0044* (1.67)
<i>Size</i>	0.0090*** (9.43)	0.0087*** (9.31)	0.0081*** (8.65)	0.0081*** (8.70)	0.0167*** (15.60)	0.0160*** (15.24)
<i>Roa</i>	0.0329** (2.56)	0.0331** (2.57)	0.0335*** (2.60)	0.0334*** (2.59)	0.0875*** (6.05)	0.0878*** (6.07)
<i>Lev</i>	-0.0149*** (-2.73)	-0.0147*** (-2.69)	-0.0154*** (-2.81)	-0.0154*** (-2.83)	-0.0418*** (-6.82)	-0.0422*** (-6.87)
<i>CFO</i>	0.0424*** (3.48)	0.0421*** (3.45)	0.0419*** (3.43)	0.0418*** (3.42)	0.0146 (1.06)	0.0141 (1.03)
<i>Year</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>Industry</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	7692	7692	7692	7692	7692	7692
<i>F Value</i>	43.22	43.28	42.68	42.67	29.08	27.85
Adjusted R ²	0.1454	0.1456	0.1438	0.1438	0.1021	0.1013

Note: This table presents results of an OLS regression of auditor industry expertise on clients' tax avoidance. The dependent variable tax avoidance is measured by *BETR*, and the key independent variable auditor industry expertise is measured by *IMS*, *IMS_D*, *IPS*, and *IPS_D*. In Model (1), we use *BETR* as a proxy for tax avoidance. In Model (2), we use *CETR* as a proxy for tax avoidance. In Model (3), we use *BTD* as a proxy for tax avoidance. The sample includes 7,692 firm-year observations for the period 2008-2012. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

are more likely to help their clients engage in tax avoidance activity. The association between auditor industry expertise and clients' tax avoidance is not significant in most of these regressions when using industry portfolio share to proxy auditor industry expertise. Overall, this study finds evidence that auditor industry expertise is associated with increased tax avoidance, but only when using industry market share to measure auditor industry expertise. These results are in line with the prediction of H2.

This study also finds that audit firm size (proxied by *Big10*) is positively associated

(2) <i>Tax-avoidance = CETR</i>			(3) <i>Tax-avoidance = BTD</i>		
<i>Spec = IPS</i>	<i>Spec = IPS_D</i>	<i>Spec = IMS</i>	<i>Spec = IMS_D</i>	<i>Spec = IPS</i>	<i>Spec = IPS_D</i>
-0.1913***	-0.1891***	2.1018***	2.0749***	1.9291***	1.9509***
(-8.33)	(-8.29)	(6.43)	(6.42)	(5.96)	(6.07)
-0.0217*	-0.0018	0.5892*	0.1223**	0.1545	0.0371
(-1.89)	(-0.43)	(1.92)	(2.18)	(0.84)	(0.62)
0.0008	0.0012	0.1074***	0.1126***	0.1311***	0.1359***
(0.32)	(0.48)	(2.83)	(3.09)	(3.70)	(3.91)
0.0042	0.0042	0.0311	0.0309	0.0319	0.0319
(1.55)	(1.56)	(0.82)	(0.82)	(0.85)	(0.85)
0.0161***	0.0160***	0.7099***	0.7115***	0.7196***	0.7181***
(15.32)	(15.40)	(47.29)	(48.26)	(48.61)	(49.18)
0.0881***	0.0879***	0.1908	0.1899	0.1897	0.1871
(6.09)	(6.08)	(0.94)	(0.94)	(0.93)	(0.92)
-0.0421***	-0.0422***	1.5633***	1.5606***	1.5700***	1.5685***
(-6.85)	(-6.88)	(18.14)	(18.11)	(18.21)	(18.20)
0.0143	0.0141	0.3265*	0.3292*	0.3349*	0.3316*
(1.05)	(1.03)	(1.70)	(1.71)	(1.74)	(1.73)
Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
7692	7692	7692	7692	7692	7692
27.88	27.86	144.15	144.21	144.00	143.98
0.1014	0.1013	0.3666	0.3667	0.3663	0.3663

with clients' tax avoidance, which means bigger audit firms are more likely and capable to help their clients avoid tax. Besides, the level of corporate tax avoidance is negatively associated with firm size and return of assets and cash flows of operation and is positively associated with leverage. The regression results of control variables are basically consistent with previous studies.

Table 8 examines the association between auditor industry expertise and tax avoidance conditional on auditor independence. The condition variable auditor independence is measured by *Fee* and *Tenure*. This study sets two interactive variables *Spec*Fee* and *Spec*Tenure* to capture the joint effect of auditor industry expertise and auditor independence. The coefficient on the independent variable (*Spec*) is not significant in most of these regressions after adding the condition variables (*Fee* and *Tenure*). But the coefficient of the interaction between auditor industry expertise (*Spec*) and auditor independence (*Fee* and *Tenure*) is negative and statistically significant in Model (1) and (2). This indicates that the association between auditor industry expertise and clients' effective tax rate (*BETR* and

Table 8 Association between Auditor Industry Expertise and Tax Avoidance Conditional on Auditor Independence

Variables	(1) Tax-avoidance = <i>BETR</i>				(2) Tax-avoidance = <i>CETR</i>	
	<i>Spec</i> = <i>IMS</i>	<i>Spec</i> = <i>IMS_D</i>	<i>Spec</i> = <i>IPS</i>	<i>Spec</i> = <i>IPS_D</i>	<i>Spec</i> = <i>IMS</i>	<i>Spec</i> = <i>IMS_D</i>
<i>Constant</i>	-0.0885*** (-4.21)	-0.0823*** (-3.98)	-0.0867*** (-4.11)	-0.0650*** (-3.17)	-0.2118*** (-8.97)	-0.1942*** (-8.35)
<i>Spec</i>	-0.0479 (-1.55)	-0.0100* (-1.81)	-0.0105 (-0.83)	-0.0016 (-0.27)	-0.0192 (-0.55)	-0.0016 (-0.26)
<i>Fee</i>	0.0178 (1.19)	0.0154 (1.07)	0.0195 (1.30)	0.0073 (0.49)	0.0056 (0.33)	-0.0024 (-0.15)
<i>Tenure</i>	0.0002 (0.44)	0.0002 (0.44)	0.0005 (1.20)	0.0002 (0.60)	-0.0003 (-0.55)	-0.0005 (-0.97)
<i>Spec*Fee</i>	-0.3572* (-1.67)	-0.0649* (-1.71)	-0.4834** (-2.13)	-0.1176* (-1.88)	-0.5784** (-2.26)	-0.0706 (-1.31)
<i>Spec*Tenure</i>	-0.0042 (-0.70)	-0.0019* (-1.72)	-0.0117*** (-2.89)	-0.0004 (-0.40)	-0.0055 (-0.83)	-0.0003 (-0.21)
<i>Big10</i>	-0.0054** (-2.14)	-0.0058** (-2.39)	-0.0059** (-2.37)	-0.0088*** (-3.76)	0.0027 (0.97)	0.0006 (0.20)
<i>Soe</i>	0.0030	0.0030	0.0030	0.0029	0.0044*	0.0043

CETR) is more negative when auditor independence is lower. The coefficient of the interaction between *Spec* and *Fee (Tenure)* is positive and statistically significant in Model (3), which means that auditor industry expertise is more positively associated with book-tax difference (*BTD*) when auditor independence is poor. To summarize, the reported coefficients of the interactive variables are uniformly consistent with H3 and indicate that industry experts are more likely to use their industry expertise to help clients engage in tax avoidance activity, especially when auditor independence is poor.

Results on control variables suggest the following patterns. There is a positive association between audit firm size and clients' tax avoidance in Table 8. Corporate efficient tax rate (*BETR* and *CETR*) is positively associated with *Size*, *RoA*, and *CFO*, and negatively associated with *Lev*. Corporate book-tax difference (*BTD*) is positively associated with *Size* and *Lev*, which means firms with bigger size and higher leverage are more likely to engage in tax avoidance activity. The regression results of control variables are basically consistent with previous researches.

(2) Tax-avoidance = <i>CETR</i>			(3) Tax-avoidance = <i>BTD</i>		
<i>Spec</i> = <i>IPS</i>	<i>Spec</i> = <i>IPS_D</i>	<i>Spec</i> = <i>IMS</i>	<i>Spec</i> = <i>IMS_D</i>	<i>Spec</i> = <i>IPS</i>	<i>Spec</i> = <i>IPS_D</i>
-0.2110***	-0.1982***	2.2271***	2.1474***	2.1766***	2.0427***
(-8.92)	(-8.61)	(6.70)	(6.56)	(6.54)	(6.30)
-0.0049	-0.0079	0.8818*	0.1997**	0.3796*	0.0144
(-0.35)	(-1.17)	(1.81)	(2.28)	(1.92)	(0.15)
0.0062	0.0097	0.0912	0.2051	0.0750	0.1711
(0.37)	(0.58)	(0.39)	(0.90)	(0.34)	(0.72)
-0.0001	-0.0004	0.0211***	0.0183***	0.0147**	0.0171***
(-0.28)	(-0.80)	(2.90)	(2.79)	(2.18)	(2.64)
-0.6320**	-0.1122***	9.4932***	1.3349*	12.5783***	0.9830*
(-2.48)	(-2.72)	(2.65)	(1.77)	(3.52)	(1.70)
-0.0086*	-0.0072*	0.1479*	0.0311*	0.0472*	0.0317*
(-1.90)	(-1.89)	(1.68)	(1.66)	(1.77)	(1.66)
0.0025	0.0003	0.1448***	0.1452***	0.1460***	0.1634***
(0.91)	(0.19)	(3.66)	(3.80)	(3.72)	(4.49)
0.0044	0.0043	0.0275	0.0269	0.0271	0.0256

Variables	(1) Tax-avoidance = <i>BETR</i>				(2) Tax-avoidance = <i>CETR</i>	
	<i>Spec = IMS</i>	<i>Spec = IMS_D</i>	<i>Spec = IPS</i>	<i>Spec = IPS_D</i>	<i>Spec = IMS</i>	<i>Spec = IMS_D</i>
	(1.25)	(1.26)	(1.25)	(1.22)	(1.67)	(1.61)
<i>Size</i>	0.0092***	0.0088***	0.0089***	0.0079***	0.0172***	0.01633***
	(9.41)	(9.26)	(9.20)	(8.44)	(15.79)	(15.28)
<i>Roa</i>	0.0331**	0.0332**	0.0333**	0.0334**	0.0874***	0.0876***
	(2.57)	(2.58)	(2.58)	(2.59)	(6.05)	(6.06)
<i>Lev</i>	-0.0153***	-0.0151***	-0.0158***	-0.0156***	-0.0414***	-0.0416***
	(-2.79)	(-2.74)	(-2.87)	(-2.83)	(-6.72)	(-6.74)
<i>CFO</i>	0.0421***	0.0416***	0.0416***	0.0416***	0.0152	0.0149
	(3.45)	(3.41)	(3.41)	(3.40)	(1.11)	(1.08)
<i>Year</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>Industry</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	7692	7692	7692	7692	7692	7692
<i>F Value</i>	38.37	38.41	38.32	37.80	27.01	26.76
Adjusted R ²	0.1463	0.1455	0.1452	0.1435	0.1029	0.1017

Note: This table presents the OLS regression results of auditor industry expertise on tax avoidance conditional on auditor independence. The dependent variable tax avoidance is measured by *BETR*, the key independent variable auditor industry expertise is measured by *IMS*, *IMS_D*, *IPS*, and *IPS_D*, and the condition variable auditor independence is measured by *Fee* and *Tenure*. *Spec*Fee* and *Spec*Tenure* are two interaction variables used to capture the joint effect of auditor industry expertise and auditor independence. In Model (1), we use *BETR* as a proxy for tax avoidance. In Model (2), we use *CETR* as a proxy for tax avoidance. In Model (3), we use *BTD* as a proxy for tax avoidance. The sample includes 7,692 firm-year observations for the period 2008-2012. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

4.4 Robustness Tests

4.4.1 Separate Analysis of Big 4 Sample

This study treats the Big 4 clients as a special sample. From the descriptive statistics in Table 4 and Table 5, this study finds that the Big 4 are more likely to identify as industry experts under the measurement of industry market share and industry portfolio share. Hence, the proxies of auditor industry expertise may mainly capture the relative scale or resource advantages of Big 4. In order to avoid the specificity of Big 4 samples affecting the reliability of our findings, this study examines the association between auditor industry

(2) Tax-avoidance = CETR			(3) Tax-avoidance = BTD		
<i>Spec = IPS</i>	<i>Spec = IPS_D</i>	<i>Spec = IMS</i>	<i>Spec = IMS_D</i>	<i>Spec = IPS</i>	<i>Spec = IPS_D</i>
(1.64)	(1.61)	(0.73)	(0.71)	(0.72)	(0.68)
0.0171***	0.0165***	0.6999***	0.7049***	0.7050***	0.7106***
(15.71)	(15.63)	(45.71)	(47.00)	(46.05)	(47.98)
0.0875***	0.0880***	0.2038	0.2028	0.2043	0.1959
(6.05)	(6.09)	(1.01)	(1.00)	(1.01)	(0.97)
-0.0416	-0.0416***	1.5411***	1.5361***	1.5525***	1.5496***
(-6.76)	(-6.76)	(17.81)	(17.74)	(17.94)	(17.90)
0.0150	0.0153	0.2996	0.2968	0.3129*	0.3049
(1.09)	(1.12)	(1.56)	(1.54)	(1.67)	(1.58)
Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
7692	7692	7692	7692	7692	7692
26.09	26.97	128.40	128.26	128.42	127.99
0.1029	0.1025	0.3677	0.3674	0.3677	0.3669

expertise and tax avoidance in the Big 4 samples separately. Table 9 presents the main results. It seems that the positive association between auditor industry expertise and tax avoidance is still there, but the coefficients of interactive variables are not significant in most of these regressions, which means that the Big 4 were less affected by independence problem compared to other audit firms.

Table 9 Association between Auditor Industry Expertise and Tax Avoidance in Big 4 Sample

Variables	(1) Tax-avoidance = <i>BETR</i>		(2) Tax-avoidance = <i>CETR</i>		(3) Tax-avoidance = <i>BTD</i>	
	<i>Spec = IMS</i>	<i>Spec = IPS</i>	<i>Spec = IMS</i>	<i>Spec = IPS</i>	<i>Spec = IMS</i>	<i>Spec = IPS</i>
<i>Constant</i>	-0.1187* (-1.84)	-0.1309* (-1.88)	-0.1505 (-1.31)	-0.1583 (-1.37)	0.7748 (0.46)	0.8693 (0.51)
<i>Spec</i>	-0.0158* (-1.76)	-0.1105** (-2.18)	-0.0133 (-0.91)	-0.0270 (-0.41)	0.2399* (1.72)	0.3715 (0.38)
<i>Fee</i>	-0.4487 (-1.14)	-0.6660* (-1.66)	-0.9655* (-1.89)	-1.0307* (-1.96)	5.6625 (0.75)	5.2720 (0.68)
<i>Tenure</i>	-0.0073 (-0.84)	-0.0015 (-1.00)	0.0011 (0.52)	0.0007 (0.34)	0.0212 (0.72)	0.0080 (0.27)
<i>Spec*Fee</i>	-0.2608 (-0.26)	-1.2158 (-1.12)	-2.6945** (-2.09)	-2.9287** (-2.07)	5.6392 (0.30)	8.8386 (0.43)
<i>Spec*Tenure</i>	-0.0093 (-1.01)	0.0081 (-1.02)	-0.0074 (-0.62)	-0.0024 (-0.23)	0.1988* (1.71)	0.0638 (0.42)
<i>Soe</i>	-0.0203** (-2.12)	-0.0187** (-1.97)	0.0046 (0.37)	0.0030 (0.24)	0.5521*** (3.01)	0.5241*** (2.89)
<i>Size</i>	0.0082** (2.17)	0.0082** (2.19)	0.0008 (0.16)	0.0010 (0.21)	0.7823*** (10.82)	0.7875*** (10.89)
<i>Roa</i>	0.0084 (0.08)	0.0118 (0.11)	0.3638*** (2.68)	0.3629*** (2.67)	5.8170*** (2.92)	5.8278*** (2.93)
<i>Lev</i>	-0.0213 (-0.73)	-0.0288 (-0.99)	0.0587 (1.55)	0.0629* (1.68)	1.2368** (2.23)	1.2501** (2.24)
<i>CFO</i>	0.0086 (0.15)	0.0130 (0.24)	0.0413 (0.55)	0.0405 (0.53)	0.4436 (0.40)	0.4675 (0.42)
<i>Year</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>Industry</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	455	455	455	455	455	455
<i>F Value</i>	7.41	7.84	4.76	4.74	29.10	29.03
Adjusted R ²	0.2075	0.2128	0.1105	0.1091	0.5606	0.5596

Note: This table presents the OLS regression results in Big 4 sample. Since Big 4 are more likely to be identified as experts based on dummy variables (*IMS_D* and *IPS_D* equal 1 in most of Big 4 sample observations), we only use continuous variables (*IMS* and *IPS*) to proxy industry expertise. The sample includes 455 firm-year observations for the period 2008-2012. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

4.4.2 Alternative Measure of Auditor Industry Expertise

This study investigates whether our results are sensitive to the measure of auditor industry expertise used. Prior studies also use clients' assets to calculate auditors' market share and portfolio share (Dunn and Mayhew, 2004; Chen et al., 2007). This study uses alternative measures *IMA* and *IPA* to proxy auditor industry expertise. *IMA* and *IPA* are calculated as follows:

$$IMA_{ik} = \sum_{j=1}^J ASSET_{ikj} / \sum_{i=1}^I \sum_{j=1}^J ASSET_{ikj}$$

where *ASSET* is clients' total assets and the numerator is the sum of assets of all J_{ik} clients of audit firm i in industry k . The denominator is the assets of J_{ik} clients in industry k summed over all I_k audit firms in the sample with clients (J_{ik}) in industry k .

$$IPA_{ik} = \sum_{j=1}^J ASSET_{ikj} / \sum_{k=1}^K \sum_{j=1}^J ASSET_{ikj}$$

where *ASSET* is clients' total assets and the numerator is the sum of the assets of all J_{ik} clients of audit firm i in industry k . The denominator is assets of all clients of audit firm i summed over all k industries.

The difference between *IMA* (*IPA*) and *IMS* (*IPS*) is clients' sales revenue is replaced by asset, so the calculation of *IMA* (*IPA*) is similar to *IMS* (*IPS*). Table 10 reports the regression results of newly-defined auditor industry expertise (*IMA* and *IPA*) on tax avoidance (*BETR*, *CETR* and *BTD*). The coefficient of key independent variable (*Spec*) is still negative and significant at 1% level in Model (1) and Model (2), and positive and significant at 1% level in Model (3). These results confirm the positive association between auditor industry expertise and tax avoidance. The coefficient of interactive variables is similar to our early finding in Table 9. *Spec*Fee* and *Spec*Tenure* are negatively associated with efficient tax rate (*BETR* and *CETR*) and negatively associated with book-tax difference (*BTD*) in most of these regressions.

Taken together, our results are qualitatively unchanged when we repeat the analyses using the alternative measure of auditor industry expertise.

Table 10 Association between Newly Defined Auditor Industry Expertise and Tax Avoidance

Variables	(1) Tax-avoidance = <i>BETR</i>		(2) Tax-avoidance = <i>CETR</i>		(3) Tax-avoidance = <i>BTD</i>	
	Spec = <i>IMA</i>	Spec = <i>IPA</i>	Spec = <i>IMA</i>	Spec = <i>IPA</i>	Spec = <i>IMA</i>	Spec = <i>IPA</i>
<i>Constant</i>	-0.0930*** (-4.41)	-0.0737*** (-3.37)	-0.2166*** (-9.15)	-0.1975*** (-8.11)	2.2311*** (6.69)	2.0649*** (6.00)
<i>Spec</i>	-0.0922*** (-3.28)	0.0151 (1.05)	-0.0896*** (-2.83)	-0.0418*** (-2.60)	0.3317 (0.75)	0.5882*** (2.60)
<i>Fee</i>	0.0161 (1.08)	0.0280 (0.89)	0.0025 (0.15)	-0.0926*** (-2.64)	0.0593 (0.25)	0.2567 (0.52)
<i>Tenure</i>	0.0001 (0.12)	0.0005 (1.12)	-0.0006 (-1.20)	-0.0005 (-0.11)	0.0177** (2.50)	0.0118* (1.71)
<i>Spec*Fee</i>	-0.3358* (-1.67)	-0.4475* (-1.76)	-0.5085** (-2.03)	-0.4771* (-1.68)	10.6510*** (3.03)	13.0949*** (3.29)
<i>Spec*Tenure</i>	0.0003 (0.07)	-0.0105** (-2.58)	-0.0027 (-0.46)	-0.0095** (-2.09)	0.0617 (0.74)	0.0094 (0.15)
<i>Big10</i>	-0.0041* (-1.66)	-0.0054** (-2.09)	0.0047 (1.64)	0.0017 (0.57)	0.15473*** (3.87)	0.1250*** (3.06)
<i>Soe</i>	0.0030 (1.24)	0.0035 (1.43)	0.0044 (1.63)	0.0052* (1.89)	0.0280 (0.74)	0.0378 (0.97)
<i>Size</i>	0.0095*** (9.69)	0.0083*** (8.26)	0.0176*** (16.06)	0.0166*** (14.76)	0.7008*** (45.47)	0.7093*** (44.77)
<i>Roa</i>	0.0322** (2.50)	0.0341** (2.55)	0.0863*** (5.97)	0.0899*** (6.04)	0.2016 (0.99)	0.1730 (0.83)
<i>Lev</i>	-0.0155*** (-2.83)	-0.0152*** (-2.67)	-0.0415*** (-6.74)	-0.0443*** (-6.98)	1.5463*** (17.88)	1.5779*** (17.65)
<i>CFO</i>	0.0421*** (3.45)	0.0435*** (3.42)	0.0154 (1.12)	0.0263* (1.85)	0.3036 (1.58)	0.2682 (1.35)
<i>Year</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>Industry</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	7692	7692	7692	7692	7692	7692
<i>F Value</i>	38.65	36.24	25.34	24.11	128.28	123.81
Adjusted R ²	0.1463	0.1442	0.0997	0.0995	0.3675	0.3708

Note: This table presents the OLS regression results of newly-defined auditor industry expertise on tax avoidance. We use auditor industry market share based on clients' assets (*IMA*) and auditor portfolio share based on clients' assets (*IPA*) to proxy auditor industry expertise. The sample includes 7,692 firm-year observations for the period 2008-2012. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

4.4.3 Self-Selection Correction

Prior research suggests that clients' decision to choose their external audit firm is intentional and not random (Lassila, Omer, Shelley, and Smith, 2010), which introduces self-selection bias into our analysis. There may exist unobservable factors which affect both the clients' decision of choosing auditor and tax avoidance, such as firm size, leverage, cash flow, and audit fee. In order to correct sample selection bias, this study adopts the two-stage regression method developed by Heckman (1979). In the first stage, this study uses a Probit model which includes the determinants of firms' decision to choose an industry expert as auditor to estimate the inverse Mill's ratio (*IMR*). The prediction model is as follows:

$$\begin{aligned} PR(Spec) = & \beta_0 + \beta_1 Tenure + \beta_2 Lnauditfee + \beta_3 Tax-ratio + \beta_4 Sales + \beta_5 Lnage + \beta_6 Local \\ & + \beta_7 Big10 + \beta_8 Soe + \beta_9 Size + \beta_{10} ROA + \beta_{11} Lev + \beta_{12} CFO + IND + Year + \varepsilon \quad (4) \end{aligned}$$

where *Spec* is a dummy variable measured by *IMS_D* and *IPS_D*, which equals 1 when clients choose industry experts as their auditors and 0 if otherwise. *Tenure* equals years the audit firm has served as auditor of their clients. *Lnauditfee* equals the natural log of audit fee. *Tax-ratio* is the statutory tax rates of clients. *Sales* equals clients' sales revenue standardized by total assets. *Lnage* is the natural log of firms' age. *Local* represent auditor's location, which equals 1 when audit firm and their clients are in the same province and 0 if otherwise. The definitions of other control variables are presented in Table 1.

Consistent with Heckman (1979), this study uses the coefficient estimates from model (4) to construct an inverse Mills ratio (*IMR*), which is included in Model (1), (2), and (3) as a control variable. The inverse Mills ratio is a bias correction term that controls for the influence of the observable and unobservable determinants of clients' decision to choose an industry expert as auditor on the association between auditor industry expertise and tax avoidance. The results of first stage are presented in Table 11.

From Table 11, when using industry market share (*IMS_D*) to measure auditor industry expertise, this study finds firms that are larger and have higher tax ratio, more sales revenue, and higher levels of debt are more likely to choose industry experts as their auditors. In addition, the audit firm's tenure, size, and the magnitude of audit fees are positively associated with the probability that the auditor will be an industry expert. When using industry portfolio share (*IPS_D*) to measure auditor industry expertise, this study finds that firms that bigger and younger, have higher tax-ratio and more sales revenue, and are closer to audit firms are more likely to choose the industry experts as their auditors. Based on the

coefficient estimates from Model (4), this study constructs an inverse Mills ratio (*IMR*) and include it as an additional explanatory variable in Model (1), (2), and (3).

Table 11 First-stage Model: Probability of Choosing Industry Expert as Auditor

Variables	(1) <i>Spec = IMS_D</i>		(2) <i>Spec = IPS_D</i>	
	Coefficient	Z-Stat	Coefficient	Z-Stat
<i>Constant</i>	-7.3525***	-17.21	-8.7839	-0.13
<i>Tenure</i>	0.0189**	2.16	0.0046	0.56
<i>Lnauditfee</i>	0.0562***	2.65	-0.0053	-0.27
<i>Tax-ratio</i>	0.5069*	1.73	0.5993*	1.72
<i>Sales</i>	0.2243***	5.80	0.1048***	2.93
<i>Lnage</i>	-0.0039	-0.92	-0.0108**	-2.16
<i>Local</i>	0.0297	0.59	0.1114**	2.24
<i>Big10</i>	1.3786***	24.66	0.2020***	4.26
<i>Soe</i>	0.0680	1.33	-0.0370	-0.72
<i>Size</i>	0.2299***	10.74	0.1621***	7.31
<i>ROA</i>	-0.4667	-1.48	-0.1656	-0.47
<i>Lev</i>	0.2815**	2.14	0.0679	0.51
<i>CFO</i>	0.1925	0.69	-0.1934	-0.68
<i>IND</i>	Controlled		Controlled	
<i>Year</i>	Controlled		Controlled	
<i>Chi-Square</i>	1881.74***		842.08***	
<i>Pseudo R²</i>	0.3810		0.2754	
<i>N</i>	7660		7133	

Note: This table presents the first-stage Probit regression result of determinants of firm choosing industry expert as auditor. Regression (1) use industry market share (*IMS_D*) to proxy industry expert, regression (2) use industry portfolio share (*IPS_D*) to proxy industry expert. The sample includes 7,660 firm-year observations for the period 2008-2012 in regression (1), and 7,133 firm-year observations in model (2). Z-statistics are presented in the column next to coefficient. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

Table 12 reports the second-stage OLS regression results of auditor industry expertise on tax avoidance. Consistent with the industry expertise of auditor being associated with higher levels of tax avoidance, this study finds a negative and significant coefficient of *Spec* in the regression of *Spec* (measured by *IMS_D*) on *CETR*, and a positive and significant coefficient of *Spec* in the regression of *Spec* (measured by *IPS_D*) on *BTD*. In addition, a negative association between interaction variables (*Spec*Fee* and *Spec*Tenure*) and efficient tax ratio (*BETR* and *CETR*) is found in most of these regressions, as well as a positive

association between interaction variables ($Spec*Fee$ and $Spec*Tenure$) and book-tax difference (BTD). In sum, auditor industry expertise is associated with higher level of clients' tax avoidance, and this association is more positive when auditor independence is lower. Our early findings are proved again after controlling the potential sample selection bias.

Table 12 Second-stage Model: Association between Auditor Industry Expertise and Tax Avoidance

Variables	(1) Tax-avoidance = $BETR$		(2) Tax-avoidance = $CETR$		(3) Tax-avoidance = BTD	
	$Spec = IMS_D$	$Spec = IPS_D$	$Spec = IMS_D$	$Spec = IPS_D$	$Spec = IMS_D$	$Spec = IPS_D$
<i>Constant</i>	-0.0754*** (-3.30)	-0.0748*** (-3.01)	-0.2330*** (-9.09)	-0.2077*** (-7.31)	2.1945*** (6.08)	3.0541*** (7.68)
<i>Spec</i>	0.0046 (0.38)	0.0230 (1.01)	-0.0241* (-1.78)	-0.0025 (-0.09)	0.1785 (0.94)	1.3543*** (3.72)
<i>Fee</i>	0.0211 (1.40)	0.0263* (1.72)	0.0039 (0.23)	-0.0018 (-0.10)	0.0844 (0.36)	0.0705 (0.29)
<i>Tenure</i>	0.0003 (0.61)	0.0004 (0.90)	0.0001 (0.13)	-0.0002 (-0.38)	0.0189*** (2.75)	0.0159** (2.29)
<i>Spec*Fee</i>	-0.3869* (-1.74)	-0.4647** (-2.06)	-0.6219** (-2.49)	-0.5557** (-2.16)	10.1768*** (2.91)	9.8882*** (2.74)
<i>Spec*Tenure</i>	-0.0059 (-1.24)	-0.0116*** (-2.71)	-0.0112** (-2.09)	-0.0092* (-1.88)	0.1091 (1.45)	0.0680 (0.99)
<i>Big10</i>	-0.0081** (-2.49)	-0.0051** (-2.00)	-0.0077** (-2.10)	0.0016 (0.55)	0.1419*** (2.76)	0.1928*** (4.71)
<i>Soe</i>	0.0033 (1.37)	0.0054** (2.20)	0.0050* (1.85)	0.0039 (1.37)	0.0292 (0.77)	0.0229 (0.58)
<i>Size</i>	0.0083*** (7.70)	0.0083*** (7.19)	0.0183*** (15.01)	0.0168*** (12.71)	0.7021*** (41.07)	0.6626*** (35.75)
<i>Roa</i>	0.0375*** (2.89)	0.0346*** (2.56)	0.0905*** (6.21)	0.0959*** (6.21)	0.1574 (0.77)	0.1328 (0.62)
<i>Lev</i>	-0.0159*** (-2.86)	-0.0158*** (-2.76)	-0.0393*** (-6.32)	-0.0337*** (-5.14)	1.5391*** (17.61)	1.4864*** (16.23)
<i>CFO</i>	0.0405*** (3.32)	0.0449*** (3.59)	0.0129 (0.94)	0.0143 (1.00)	0.3453* (1.79)	0.2926 (1.47)
<i>IMR</i>	-0.0090 (-1.36)	-0.0117 (-0.94)	0.0188** (2.53)	0.0023 (0.16)	-0.0235 (-0.22)	-0.0794*** (-4.00)
<i>Year</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>Industry</i>	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	7660	7133	7660	7133	7660	7133

Variables	(1) Tax-avoidance = BETR		(2) Tax-avoidance = CETR		(3) Tax-avoidance = BTD	
	Spec = IMS_D	Spec = IPS_D	Spec = IMS_D	Spec = IPS_D	Spec = IMS_D	Spec = IPS_D
F Value	37.47	40.28	24.37	24.72	125.02	132.23
Adjusted R ²	0.1463	0.1498	0.1032	0.1002	0.3690	0.3711

Note: This table presents the second-state OLS regression results of auditor industry expertise on tax avoidance. Consistent with the first-stage model, the sample includes 7,660 firm-year observations for the period 2008-2012 when using *IMS_D* to proxy auditor industry expertise and 7,133 firm-year observations when using *IPS_D* to proxy auditor industry expertise. T-statistics are in the parentheses. ***, **, * stand for a statistical significant level of 1%, 5%, and 10% respectively.

5. Conclusion

Auditor industry expertise is an important embodiment of auditor professional competence and a determinant of audit quality (De Angelo, 1981). Auditor industry expertise, including industry-specific knowledge and experiences, helps auditor improve professional judgment and audit efficiency, thus improving audit quality. In addition, industry expertise helps audit firms increase the demand for audit and non-audit services, improve audit efficiency through economics of scale, and affects client-relevant audit outcomes like audit fee. Therefore, developing industry expertise is also an efficient market strategy for audit firms to gain competitive advantage. From these perspectives, prior studies examined the influence of auditor industry expertise on audit quality or audit fee. Unlike these studies, this paper connects auditor industry expertise with clients' tax avoidance, extends the consequences of auditor industry expertise, and also sheds light on the determinants of corporate tax avoidance.

Using A-share listed companies on the Shanghai and Shenzhen Stock Exchange in 2008-2012 as the research sample, this paper demonstrated that an auditor who is an industry expert is more likely to help its clients engage in tax avoidance activity, especially when auditor independence is lower (proxied by audit fee and audit tenure). This result indicates that in case of poor auditor independence, auditor industry expertise may encourage clients' tax avoidance instead of constraining it.

These findings have some implications for policy makers. On one hand, the competition in the Chinese audit market is relatively fierce compared to that in developed countries, but most of China's local CPA firms have not yet developed their own industry expertise. Chinese regulators should encourage local CPA firms to develop industry expertise and further facilitate policies to make local CPA firms bigger and stronger. On the other hand, since our findings suggest that auditor industry expertise is positively associated with clients'

tax avoidance, especially when auditor independence is poor, regulators should also pay attention to auditor independence problem while encouraging the development of auditor industry expertise. Auditors use their industry-specific knowledge and experience to help clients engage in tax avoidance activities that may bring a win-win situation for auditors and clients, since the tax avoidance strategies developed by industry experts are more efficient and difficult to detect, so the saved tax expenses can increase clients' after-tax profits and may increase auditor's revenue. However, tax avoidance activities are at the cost of increasing risks of both shareholders and auditors, and are also not conducive to the CSRC's supervision of listed companies. Hence, Chinese regulators should encourage local CPA firms to develop industry expertise while protecting auditor independence and continue to strengthen legal systems by improving the audit market in order to establish and maintain a healthy and orderly market for audit firms in China.

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