

Mediating effects of audit quality on the relationship between audit firm rotation and tax avoidance: Evidence from China

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Abstract

This study examines the relationship between audit firm rotation and tax avoidance. Modified auditor opinions were used as an audit quality. The findings of the study suggest that mandatory audit firm rotation has not an indirect effect on temporary and permanent book-tax differences via modified auditor opinions. Moreover, voluntary and no-audit firm rotation was found to have an indirect relationship with temporary book-tax differences via the modified auditor opinions. The nonBig4 audit firm findings suggest that voluntary and no-audit firm rotations have an indirect relationship with the temporary book-tax difference via modified auditor opinions. We also find strong evidence that voluntary and no-audit firm's rotation increase tax avoidance via modified auditor opinions in non-SOEs. The findings of this study suggest that voluntary and no-audit firm rotation increases tax avoidance via modified auditor opinions.

Keywords: Permanent book tax difference, temporary book tax differences, mandatory audit firm rotation, voluntary audit firm rotation, no rotation, Tax avoidance, Audit Quality, Non-financial firms, China

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Introduction

Tax avoidance represents the minimization of tax liability through lawful tax avoidance planning (Lee, Dobiynski, & Minton, 2015). The objective of this study is to investigate the mediating effect of audit quality (modified auditor opinion) on the relationship between audit firm rotation and tax avoidance in China². Prior research has discussed the different measures of tax avoidance. This study focuses on book-tax differences as a measure of tax avoidance. Recent trends show that companies record higher income to shareholder and less taxable income to tax authorities in same recording period. The areas of non-conformity between financial accounting and tax rule provide an opportunity for a firm to manage the upward financial income and downward taxable income (Brooks, Cheng, & Sun, 2012). Wilson (2009) investigates the elements of the temporary and permanent book-tax differences that identify the tax avoidance. Weber & Willenborg (2006) found a positive relationship with modified auditor opinion and book tax differences. Auditors modify their opinions when they find some financial reporting problems (Vichitsarawong & Pornupatham, 2015). Bradshaw et al.

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² Auditor rotation has two types, audit partner and audit firm rotation. The SOX act section 203 has been enforced the partner rotation but audit firm rotation is an under consideration. This study focuses on the audit firm rotation (Chi, 2011).

(2001) suggested that auditors limited issue the qualified opinion. The disclaimer and adverse opinion issue very rare. However, they modify their opinion with explanatory language if they find going concern doubt. Therefore, if auditors found that large book-tax differences are occurred due to earning problems they convey these issue through modified auditor opinions³.

The Chinese economy has grown to become the second-largest economy in the world. China adopted the mandatory audit firm rotation rule for major state-owned enterprises (SOEs) in 2004. At the start of few companies were adopted this policy. In addition, in 2005 the SASAC (State-owned Assets supervision and administration commission of the state council) required all SOEs should be changed their audit firm with a new firm after five consecutive years (M. Firth, O. M. Rui, & X. Wu, 2012). Prior research develops the relationship between audit firm rotation and audit quality. For example, (Al-Khouri et al., 2015; Antonio & Bassetti, 2014; Bell, Causholli, & Knechel, 2015; Church, Jenkins, McCracken, Roush, & Stanley, 2014; Davis, Soo, & Trompeter, 2009; M. Firth et al., 2012; Garcia-Blandon & Argiles, 2015; Ferdinand A Gul, Jaggi, & Krishnan, 2007; Jones et al., 2012; Knechel & Vanstraelen, 2007; Kwon, Lim, & Simnett, 2014; Lennox, Wu, & Zhang, 2014; Manry, Mock, & Turner, 2008; Ruhnke & Schmidt, 2014; Ruiz-Barbadillo, Gomez-Aguilar, & Carrera, 2009; Tepalagul & Lin, 2015) discussed audit firm rotation, auditor independence and audit quality. The findings of these studies show positive and negative relationships between audit firm rotation and audit quality. Prior research describes the inconsistent finding of audit firm rotation and audit quality. Dopuch, King, and Schwartz (2001) find that audit quality improves in the mandatory rotation as compared to the non-mandatory rotation. When a new auditor starts the company audit, he wants to know information about the company (Johnson & Lys, 1990). Therefore, if audit firm does not follow the mandatory audit firm rotation rule and serve more than five years, then the auditors are more familiar with the client managers. Regarding the long-term auditor-client relationship, IFAC (2003) stated that excessive familiarity between auditors and clients lead to auditors less self-satisfaction or reluctance to face the challenges appropriately therefore also decreases the level of skepticism. Further, its effect the auditor's incremental learning with a passage of time. In this situation quality of audit decreases. This sign motivates the companies for great tax planning. So long-term auditor-client relationships allow for greater tax planning through tax expense.

This study contributes the following ways. First, we use the first-time modified auditor opinion in the tax research as a mediator. Second, this study extends the auditor behavior characteristic towards company tax avoidance perspectives. Third, this study extends the Chen and Chu (2005) study with respect to auditor professional integrity towards tax avoidance. Fourth, this study extends the Big4 audit firm rotation literature with respect to tax avoidance. Our findings suggest that Big4 auditors do not become a part of company tax avoidance strategy in China.

Our study findings suggest that mandatory audit firm rotation has no indirect effect on temporary and permanent book-tax differences through modified auditor opinion. Moreover, findings of the voluntary and no-audit firm rotation have an indirect relationship with temporary book-tax differences through modified auditor opinion. The non-Big4 audit firm findings suggest that voluntary and no-audit firm rotation has an indirect relationship with temporary book-tax differences through modified auditor opinion. We also find strong evidence that voluntary and no-audit firms increase the tax avoidance through modified auditor opinion in non-SOEs. These findings have an important implication for multinational firms, auditors, policy makers and financial report users. Whenever international investors enter in Chinese capital markets, they collect information about auditors. Then, the mandatory auditor rotation plays a significant role in asymmetric information. The rest of this paper

³As before Sarbanes-Oxley Act (SOX) section 404, the auditors claimed that main material related weakness in the internal control is related to deferred tax assets and deferred tax liabilities (Weber & Willenborg, 2006).

is structured as follows: the institutional background, hypothesis development, research methodology, empirical results and conclusions.

2. Institutional background

2.1. Tax system of China

The Chinese tax and accounting system changed from a conforming (dependent) to a non-conforming (independent) system in 1985. Before that, the process for calculating the accounting profit was the same as that for calculating taxable income, so no book-tax differences occurred in China (Tang & Firth, 2011). The Ministry of Finance (MOF) and other regulatory bodies, such as the Chinese Securities and Regulatory Commission (CSRC), issued new accounting rules in 1996. After two years, the MOF issued new accounting standards that were implemented in 1999 (X. Wang & Wu, 2011). Moreover, the MOF renewed the accounting standards for the listed companies on 15 February 2006. These standards were applied to Chinese listed companies in 2007 (CAI, 2009). These standards require every Chinese company listed to adopt the balance sheet liability technique for income tax accounts (Hu, Cao, & Zheng, 2015). The new tax reform was issued in China in 2008. The statutory company tax rate decreased from thirty-three percent to twenty-five percent with these reforms. These reforms allow every company to use a tax adjustment without a business purpose. The goal of these reforms is to control illegal tax avoidance practices (Hogan & Noga, 2012). Further, we focus on the Chinese audit market.

2.2. Chinese Audit Market

Europe and the U.S have the biggest audit markets around the world. These markets have large audit companies (Bradbury et al. 2014). The GAO (2003) defined the biggest auditing firms as the “Big 4” audit firms. The U.S and European audit markets have become the biggest audit markets with the dominant Big4 audit firms, while China has fewer Big4 audit firms. The Chinese audit market has the lowest, with 17% of the Big4 share among the twenty-two countries. The Chinese audit market is very young compared to the U.S and European audit markets. Two auditors are needed for signing audit reports. These two auditors should have the same legal liability (Michael E. Bradbury, Ahsan Habib, & Donghua Zhou, 2014; Francis, Michas, & Seavey, 2013).

At the start of 1994, China issued a law for CPAs (Certified Public Accountants) which defined the auditor responsibilities, audit services, and audit firms’ legal status. This law provided the complete framework for the development of the audit market. At that time, the quality of Chinese audit companies were not as good as foreign audit companies (Big4). They had no audit expertise or proper methodologies because audit companies were in the initial development process. In 1996, all Chinese auditing companies were jointly working with research institutions, government agencies, universities and government sponsoring bodies (M. Firth et al., 2012). To encourage auditor independence, the Chinese Institute of Certified Public Accountants (CICPA) and the Ministry of Finance (MOF) announced the disaffiliation program in 1998 (Ferdinand A. Gul, Sami, & Zhou, 2009).

Additionally, the CSRC (China Security regulatory commission) (2001) issued sixteen disclosure of information rules. After two months, the CSRC (2002) modified the sixteen rules. As per the modification, the IPO (initial public offering) increased by three hundred million yuan for the listed companies. Because China had less domestic audit firm competition, the Big4 audit firms increased their business from 2000 to 2006, as per the requirement of the supplementary audits and low tax bracket. According to CICPA’s (Chinese institute of certified public accountants) top 100 audit companies, the top four companies belong to the Big4 audit firms. The Chinese audit market consists of the Big4 and non-Big4 audit firms, which provides us with an opportunity to examine the audit

quality of two types of companies (M. A. Firth, O. M. Rui, & X. Wu, 2012). Further, we focus on the audit firm rotation.

2.3. Mandatory audit firm rotation in China

The failure of Enron, WorldCom, and other major companies started the debate on auditor rotation (Chi, Huang, Liao, & Xie, 2005). Initially, audit firm rotation rules were adopted in a few countries (Chi et al., 2005). For example, Italy, Brazil, South Korea, Singapore, Pakistan, India Turkey, Canada, Spain, Austria and Slovakia implemented the audit firm rotation rule. However, Ireland rejected the audit firm rotation policy (Siregar, Amarullah, Wibowo, & Anggraita, 2012). China adopted the mandatory audit firm rotation rule for central state-owned enterprises (SOEs) in 2004. At the start of few companies were adopted this policy. In addition, in 2005 the SASAC (State-owned Assets supervision and administration commission of the state council) required all SOEs should be changed their audit firm with a new firm after five consecutive years (M. Firth et al., 2012).

2.4. Modified auditor opinion in China

The first Chinese auditing standard book was issued on 15 February 1996. After two months, Yanzhong Enterprises Co. Ltd. received the first qualified auditor's opinion in China, which was issued by the Da Hua CPA. This qualified opinion was based on the generally accepted accounting standard (GAAS). This was the turning point for auditing practices in China (C. J. P. Chen, Su, & Zhao, 2000). Further, the first disclaimer opinion was issued in 1997. This disclaimer opinion was issued based on two reasons. First, the Bao-Shi Electronic Company stopped its operations in the middle of 1996, but the board could not predict a reasonable date. Second, the auditor was unable to deliver his opinion on the inventory costing methods. The first adverse opinion was also issued in 1997. The auditor indicated that the company could not continue to operate on the basis of the financial difficulty it faced, and its product had decreased in demand. These events show that the Chinese audit market has an audit risk. In most cases, the auditors face difficulties for their opinions. The auditors that issued the first adverse and disclaimer opinions faced great pressure from government agencies and other related parties (C. J. Chen, Chen, & Su, 2001). DeFond, Wong, and Li (1999) noted that companies that had poor performance tended to shift from large to small auditing companies and compromise the audit quality. Chinese auditors often issue the following: a qualified opinion, adverse opinion disclaimers, and an explanatory paragraph as a modified opinion. We use the modified auditor opinion as an audit quality.

3. Theory

We reviewed the deterrence Allingham and Sandmo model and previous studies which were based on the agency theory (K.-P. Chen & Chu, 2005; Crocker & Slemrod, 2005; Desai & Dharmapala, 2006; Desai, Dyck, & Zingales, 2007). These studies explain the agency theory such as, companies define their strategies about tax evasion which is based on the employment contract between the shareholder and the company tax manager. Chen and Chu (2005) investigates how the employment contract affects tax avoidance. They define the two reasons for tax avoidance. First, managers work hard to reduce the tax liabilities and received compensation. Managers work hard for future benefits. Second, managers compromise their integrity with internal control system. Managers become part of the tax avoidance strategy. Their findings are consistent with (Desai & Dharmapala, 2006; Desai et al., 2007). This study follows the Chen and Chu (2005) second reason, for example, if audit firm does not follow the mandatory audit firm rotation rule and serve more than five years, then the auditors are more familiar with the client managers. The excessive familiarity between auditors and clients lead to auditors less self-satisfaction or reluctance to face the challenge appropriately therefore also decreases the level of skepticism. In addition, its effect the auditor's incremental learning with the passage of time. In this situation quality of audit decreases. This sign motivates the opportunist managers for great tax planning. So long-term auditor-client relationships allow for greater tax planning through tax expense.

3.1. Hypothesis development

Book-tax differences provide the tax avoidance signals. Lisowsky, Robinson, and Schmidt (2010) noted that 101 tax avoidance transactions were stated to the IRS as recorded transactions. They found that thirty-eight transactions were related to temporary book-tax differences and twelve were related to permanent book-tax differences. Prior literature has discussed the different measures for tax avoidance. In this paper, we consider the book-tax differences for tax avoidance. Tax avoidance strategies facilitate the management opportunistic behavior (Chen et al. 2010; Desai and Dharmapala 2006 and 2009). Wilson (2009) suggests that tax shelter is tool for strong corporate governance and wealth creation. Tax avoidance strategies contain complex transactions. These transactions provide the opportunity for opportunist manager for earning management and related party transactions. An auditors play a significance role in examining these transactions (Brooks, Cheng, & Sun, 2012).

This study predicted that the audit firm rotates in two ways, mandatory and voluntary rotation. China adopted the mandatory audit firm rotation rule for major state-owned enterprises (SOEs) in 2004. At the start of few companies were adopted this policy. In addition, in 2005 the SASAC (State-owned Assets supervision and administration commission of the state council) required all SOEs should be changed their audit firm with a new firm after five consecutive years (M. Firth et al., 2012). Prior studies have discussed the audit firm rotation from auditor independence and audit quality perspectives⁴. We consider the modified auditor opinion as the audit quality. Previous studies have used modified auditor opinion as audit quality, e.g., Chow & Rice (1982); Craswell, Stokes, & Laughton (2002); and C. Lennox (2000). Nevertheless, a few of the Chinese's studies also used modified auditor opinion as audit quality, including J. Chen et al. (2001); S. Chen, Sun, & Wu (2010); DeFond & Francis (2005); Firth et al. (2012); and Wang, Wong, & Xia (2008). Prior evidences found inconsistent findings. Nevertheless, few of the studies suggest that audit firm rotation improves the audit quality. For example, Dopuch et al. (2001) and K. J. Wang and Tuttle (2009) found that audit quality increases in the mandatory audit firm rotation as compared to non-mandatory rotation. The auditor has a fixed period in a mandatory rotation. So, if audit firm does not follow the mandatory audit firm rotation rule and serve more than five years, then the auditors are more familiar with the client managers. IFAC (2003) stated that excessive familiarity between auditors and clients lead to auditors less self-satisfaction or reluctance to face the challenge appropriately therefore also decreases the level of skepticism. In addition, its effect the auditor's incremental learning with a passage of time. In this situation quality of audit decreases. This sign motivates the companies for great tax planning. So long-term auditor-client relationships allow for greater tax planning through tax expense.

In short, this study argues that when audit firms follow the mandatory audit firm rotation rule, it provides the less of a chance for great tax planning strategies. If the firm does not follow the mandatory audit firm rotation rule, then companies have chance for great tax planning. We propose the hypothesis based on the above discussion and in light of the previous studies.

H1 (a)-Audit quality has a positive relationship between audit firm rotation and temporary book-tax differences.

H1 (b)-Audit quality has a positive relationship between audit firm rotation and permanent book-tax differences.

⁴ (Al-Khoury et al., 2015; Antonio & Bassetti, 2014; Bell et al., 2015; Church et al., 2014; Davis et al., 2009; M. Firth et al., 2012; Garcia-Blandon & Argiles, 2015; Ferdinand A Gul et al., 2007; Jones et al., 2012; Knechel & Vanstraelen, 2007; Kwon et al., 2014; Lennox et al., 2014; Manry et al., 2008; Ruhnke & Schmidt, 2014; Ruiz-Barbadillo et al., 2009; Tepalagul & Lin, 2015) discussed audit firm rotation, auditor independence and audit quality. The findings of these studies show positive and negative relationships between audit firm rotation and audit quality.

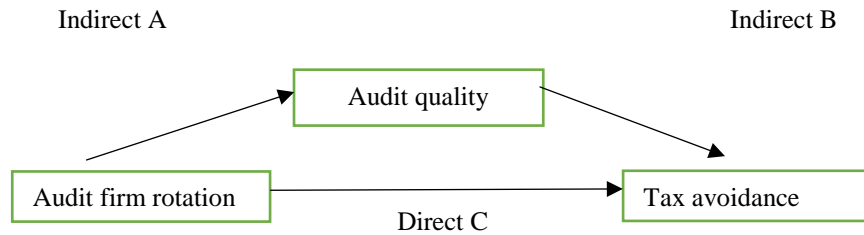


Figure 1: Relationship between audit firm rotation, audit quality and tax avoidance

4. Research Methodology

4.1. Sample and data

This study is based on data from 1495 non-financial companies from 2006 to 2014 that are listed in the Shanghai and Shenzhen stock exchanges. Data were collected from the China Security Market & Accounting Research (CSMAR) database. Companies that had incomplete data were deleted. Sample details are reported in Table 3.

Table 1: List of industries

Sr#	Code	Industry	% age	Sr#	Code	Industry	% age
1	A01	Agriculture	0.890	35	C39	Computer, communications and other electronic equipment manufacturing	8.312
2	A02	Forestry	0.362	36	C40	Instruments Manufacturing	0.488
3	A03	Livestock	0.724	37	C41	Other Manufacturing	0.609
4	A04	Fisheries	0.368	38	D44	Electricity, heat production and supply industry	3.443
5	A05	Agriculture, forestry, animal husbandry, fishery and services	0.060	39	D45	Gas Production and Supply	0.428
6	B06	Coal Mining and Dressing	1.271	40	D46	Gas Production and Supply	0.548
7	B07	Oil and gas industry	0.247	41	E47	Housing construction	0.060
8	B08	Ferrous metal mining industry	0.428	42	E48	Civil engineering construction	2.113
9	B09	Non-ferrous metal mining industry	1.210	43	E50	Architectural decoration and other construction	0.675
10	B11	Mining support activities	0.301	44	F51	Wholesale Trade	0.060
11	C13	Agro-food processing industry	1.571	45	F52	Retailing	3.925
12	C14	Food Manufacturing	1.030	46	G54	Road transport	1.511
13	C15	Wine, soft drinks and refined tea manufacturing	1.826	47	G55	Water Transportation	1.391
14	C17	Textile Industry	2.053	48	G56	The air transport industry	0.488
15	C18	Textile and garment, apparel industry	1.103	49	G58	Handling and Transportation Agency	0.0602
16	C19	Leather, fur, feather and their products and footwear	0.261	50	G59	Warehousing	0.187
17	C20	Wood processing and wood, bamboo, rattan, brown grass products industry	0.328	51	H61	Accommodation Industry	0.428
18	C21	Furniture manufacturing	0.147	52	H62	Catering	0.247
19	C22	Paper and paper products industry	1.297	53	I63	Telecommunications, radio and television and satellite transmission services	0.301
20	C23	Printing and reproduction of recorded media industry	0.274	54	I65	Software and IT services	2.588

Table 1: Contd.

<i>Sr#</i>	<i>Code</i>	<i>Industry</i>	<i>% age</i>	<i>Sr#</i>	<i>Code</i>	<i>Industry</i>	<i>% age</i>
21	C24	Cultural, educational, industrial America, sports and entertainment products manufacturing	0.254	55	J67	Capital Market Services	0.368
22	C25	Petroleum processing, coking and nuclear fuel processing industry	0.983	56	J69	Other financial sector	0.127
23	C26	Chemical materials and chemical products manufacturing	7.088	57	K70	Real Estate	7.189
24	C27	Pharmaceutical Manufacturing	5.878	58	L71	Leasing Industry	0.0602
25	C28	Chemical fiber manufacturing industry	1.197	59	L72	Business Services	0.909
26	C29	Rubber and plastic products industry	1.671	60	M73	Research and experimental development	0.0602
27	C30	Non-metallic mineral products industry	3.003	61	M74	Professional Technical Services	0.308
28	C31	Ferrous metal smelting and rolling processing industry	1.792	62	N77	Ecological protection and environmental management industry	0.194
29	C32	Non-ferrous metal smelting and rolling processing industry	2.755	63	N78	Public facilities management industry	0.916
29	C33	Fabricated Metal Products	1.792	64	P82	Education	0.060
30	C34	General equipment manufacturing	3.357	65	Q83	Health	0.127
31	C35	Special equipment manufacturing	3.598	66	R85	News and publishing industry	0.428
32	C36	Automotive Manufacturing	3.364	67	R86	Radio, television, film and video production industry record	0.308
33	C37	Railways, shipping, aerospace and other transportation equipment manufacturing	1.678	68	S90	Complex	1.511
34	C38	Electrical machinery and equipment manufacturing	5.417				

Table 1 reports data on the sixty-eight industries. The main industries include computers, communications and other electronic equipment manufacturing, Retailing, Chemical materials and chemical products manufacturing, Pharmaceutical Manufacturing, Nonmetallic mineral products industry, Software and IT services and Real Estate having the percentages 8.312, 3.925, 7.088, 5.878, 3.003, 5.417, 2.588 and 7.189, respectively.

4.2. Dependent variables

We followed the Jackson (2015) study for temporary and permanent book-tax differences. First, we calculated the total book-tax differences. Next, the deferred tax expenses for temporary book-tax differences were calculated. Finally, we calculated the permanent book-tax differences by using the following formula:

PBTD (Permanent book-tax differences) = Total book-tax differences – TBTD (Temporary book-tax differences)

We use permanent and temporary book-tax differences as the dependent variable.

4.3. Independent, mediating and control variables

We followed the M. Firth et al. (2012) study for measuring the various types of audit firm rotations. We measured these rotations in the following ways: first, mandatory audit firm rotation if the audit firm rotates after five years then 1, otherwise 0. Second, voluntary audit firm rotation measure when the audit firm rotates before five years then 1, otherwise 0. Third, no-audit firm rotation measure when audit firm does not rotate after five years then 1, otherwise 0. We use the modified auditor opinion as a mediating variable. We followed Chen, Sun, & Wu (2010) for the modified opinion. We use qualified opinion, adverse opinion disclaimers, and the explanatory paragraph as the modified opinion.

We use eleven control variables. First, we use the firm size measured by the natural log of the assets. We follow the Dyreng, Hanlon, and Maydew (2010) study. Second, we use return on assets measured by the profit after tax divided by total assets, following the Comprix, Graham, and Moore (2011) study. Third, we followed the Kallapur, Sankaraguruswamy, and Zang (2010) study for measuring the leverage measured by total liabilities divided by total assets. Fourth, we include receivables (Rec) measured by receivables to total assets. We followed the Craswell, Stokes, & Laughton (2002) study for receivables. Fifth, we include loss as a dummy variable. We followed the Kallapur et al. (2010) study. Sixth, we control with the ownership types use (SOE) as a dummy variable if the company belongs to SOE then 1, otherwise 0 by followed the H. Chen, Chen, Lobo, and Wang (2011). Seventh, we followed M. Firth et al. (2012) study for measuring the operating income (OPI) measured by income from operation less profit from other operations divided by total assets. Eighth, we control auditor type's Big4 and nonBig4 auditor by following the Zureigat (2015) study. Ninth, we use statutory tax rate change as a dummy variable the year after tax reform then 1, otherwise 0. Tenth, we use the inventory (INV) measured by inventory divided by total assets by following the Craswell, Stokes, & Laughton (2002) study. Finally, we include, the modified auditor opinion as a dummy variable. We use the modified auditor opinion as a control and mediating variable. We followed the M. Firth et al. (2012) study. The detail of the variables is presented in table 2.

Table 2: Variable Definitions

<i>Variables</i>	<i>Definition</i>	<i>Source</i>
TBTD	Temporary book tax differences	CSMAR Database
PBTD	Permanent book tax differences	CSMAR Database
MAOP	If firm received modified auditor opinion equal to 1 otherwise 0	CSMAR Database
VR	Voluntary rotation (If audit firm rotates before five years equal to 1 otherwise 0)	CSMAR Database
MR	Mandatory rotation (If audit firm rotates after five years equal to 1 otherwise 0)	CSMAR Database
NR	No-audit firm rotation (If audit firm does not rotate after five years equal to 1 otherwise 0)	CSMAR Database
Ln_A	Size (Natural log of assets)	CSMAR Database
SOE	If Company belongs to State owned enterprise 1 other wise 0	CSMAR Database
ROA	Return on assets. =Profit after tax /Total assets	CSMAR Database
Loss	If firm suffer loss in year t e 1 other wise 0	CSMAR Database
STRG	It represents the changes in tax rate, after 2008 1 otherwise 0	CSMAR Database
Big4	If auditor from Big4 audit firm, then 1 otherwise 0	CSMAR Database
Lev	Leverage. It is calculated as Total liabilities divided by Total assets	CSMAR Database
Rec	It is calculated as receivable divided by total assets	CSMAR Database
INV	It is calculated as Inventory divided by total assets	CSMAR Database
OPI	It is calculated as (Operating income – income from other operation / total assets)	CSMAR Database

4.4. The model

We use audit quality as a mediator for the relationship between audit firm rotation and tax avoidance. We followed Baron and Kenny (1986) for regression and considered the latest critique which is modified by Zhao, Lynch, and Chen (2010). Baron and Kenny (1986) suggested that mediation analysis can be performed in three steps as follows: first, mediating variable regresses on the selected independent variable. Second, dependent variable regresses independent variables. Third, dependent variable regresses on both independent and mediator variables. They recommended that the independent variable should be significant in the first two models. The third model should be expected to show all the independent variables as insignificant and mediator should be expected to show them as significant.

Zhao et al. (2010) recommended that a significant relationship between the dependent and independent variable was not needed because it can be confused. Therefore, it indicates the sum of the indirect and direct effects with the presence of a mediator. Mediation recognizes the indirect effect. We followed the Zhao et al. (2010) study for mediation. Two models were followed to find the mediation effect of the audit quality according to the study hypothesis.

$$\text{MAOP} = \alpha + \beta_1(\text{MR}) + \beta_2(\text{VR}) + \beta_3(\text{NR}) + \beta_4(\text{ROA}) + \beta_5(\text{Ln}_A) + \beta_6(\text{Lev}) + \beta_7(\text{Rec}) \\ + \beta_8(\text{INV}) + \beta_9(\text{SOE}) + \beta_{10}(\text{Big4}) + \beta_{11}(\text{OPI}) + \beta_{12}(\text{STRG}) + \beta_{13}(\text{Loss})$$

Where MAOP- modified auditor opinion as a dependent variable. If a firm receives modified audit opinion equal to 1 otherwise 0.

MR- Mandatory audit firm rotation (if audit firm completes five years equal to 1 otherwise 0).

VR- Voluntary rotation (if audit firm rotates before five years equal to 1 otherwise 0)

NR- No- rotation (if audit firm rotates after five years equal to 1 otherwise).

ROA – Profit after tax divided by total assets.

Ln_A -Natural log of the total assets.

Lev – Total liabilities divided by total assets.

Rec- Receivable divided by total assets.

INV- Inventory divided by total assets.

SOE- Dummy variable if the company belongs to SOE then 1 otherwise 0.

Big4- Dummy variable if auditor belongs to Big 4 firm then 1 otherwise 0.

OPI- Profit from operation –Income from other operation divided by total assets.

STRG- Dummy variable after tax reform 2008 change tax rate than 1 otherwise 0.

Loss- Dummy variable if the company shows loss status then 1 otherwise 0.

$$\text{TBTD} = \alpha + \beta_1(\text{MR}) + \beta_2(\text{VR}) + \beta_3(\text{NR}) + \beta_4(\text{MAOP}) + \beta_5(\text{Ln}_A) + \beta_6(\text{Lev}) + \beta_7(\text{Rec}) \\ + \beta_8(\text{INV}) + \beta_9(\text{SOE}) + \beta_{10}(\text{Big4}) + \beta_{11}(\text{OPI}) + \beta_{12}(\text{STRG}) + \beta_{13}(\text{Loss}) \\ + \beta_{14}(\text{ROA})$$

$$\text{PBSD} = \alpha + \beta_1(\text{MR}) + \beta_2(\text{VR}) + \beta_3(\text{NR}) + \beta_4(\text{MAOP}) + \beta_5(\text{Ln}_A) + \beta_6(\text{Lev}) + \beta_7(\text{Rec}) \\ + \beta_8(\text{INV}) + \beta_9(\text{SOE}) + \beta_{10}(\text{Big4}) + \beta_{11}(\text{OPI}) + \beta_{12}(\text{STRG}) + \beta_{13}(\text{Loss}) \\ + \beta_{14}(\text{ROA})$$

MR- Mandatory audit firm rotation (if audit firm completes five-years equal to 1 otherwise 0).

VR- Voluntary rotation (if audit firm rotates before five-years equal to 1 otherwise 0).

NR- No- rotation (if audit firm rotates after five-years equal to 1 otherwise 0).

MAOP- Dummy variable if firm receives modified opinion equal to 1 otherwise 0

ROA – Profit after tax divided by total assets

Ln_A - Natural log of the total assets

Lev – Total liabilities divided by total assets

Rec- Receivable divided by total assets

INV- Inventory divided by total assets

SOE- Dummy variable if company belongs to SOE then 1 otherwise 0

Big4- Dummy variable if auditor belongs to Big 4 firm then 1 otherwise 0

OPI- Profit from operation –Income from other operation divided by total assets.

STRG- Dummy variable after tax reform 2008 change tax rate than 1 otherwise 0

Loss- Dummy variable if company shows loss status then 1 otherwise 0

5. Empirical Results

5.1. Descriptive Statistics

Table 3: Descriptive Statistics

<i>Variables</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
TBTD	13455	-0.003	0.013	-0.277	0.257
PBTD	13455	3.250	2.030	-1.400	7.690
MAOP	13455	0.014	0.118	0	1
VR	13455	0.172	0.377	0	1
MR	13455	0.019	0.138	0	1
NR	13455	0.071	0.258	0	1
Ln_A	13455	21.680	1.346	0.50	28.001
Loss	13455	0.186	0.389	0	1
SOE	13455	0.487	0.491	0	1
Big4	13455	0.028	0.167	0	1
STRG	13455	0.667	0.471	0	1
STRG	13455	0.223	0.200	0	1
ROA	13455	1.807	211.450	-2146	23509.770
Lev	13455	10.056	382.190	-0.195	34656.180
Rec	13455	0.221	3.903	0.004	296.250
INV	13455	1.517	32.239	0.007	2575.770
OPI	13455	2.500	1.040	-5.00	3.310

Note: TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV, and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

Table 3 reports the descriptive statistics. The result shows that the mean value of the temporary book-tax differences (TBTD), -0.003, indicates that sample the SOE and non-SOEs range from -0.277 to 0.257. The permanent book-tax differences (PBTD) has a mean value of 3.250 and ranges from -1.400 to 7.690. The modified auditor opinion (MAOP) has an average value 0.014 and ranges from 0 to 1. The voluntary auditor rotation (VR), mandatory audit firm rotation (MR), no-rotation (NR), loss, SOE, Big4 and statutory tax rate change mean values are 0.172, 0.019 and 0.071, 0.186, 0.487, 0.028 and 0.667, respectively, having a range in values from 0 to 1. Similarly, for the size of the company Ln_A, the return on assets (ROA), leverage (Lev), receivable (Rec), inventory (INV) and operating income have mean values of 21.680, 1.807, 10.056, 0.221, 1.517 and 2.500, respectively, and range in values from 0.50 to 28.001, -2146 to 23509.770, -0.195 to 34656.180, 0.004 to 296.250, 0.007 to 2575.770 and -5.00 to 3.310, respectively. In the next step, to test the external validity of the study, the variance ANOVA, and Kruskal–Wallis test are performed.

Table 4: Results of variance ANOVA, and Kruskal–Wallis test

<i>Variables</i>	<i>ANOVA (F)</i>	<i>Kruskal–Wallis (χ^2)</i>
TBTD	3.49	754.000
PBTD	56.44	995.376
MR	1.45	145.667
VR	1.05	45.503
NR	1.27	127.674
Ln_A	21.28	1908.503
ROA	3.17	929.709
Loss	4.10	436.138
MAOP	2.97	318.446
STRG	0.53	58.403
Big4	8.94	916.044
SOE	27.06	1826.445
LEV	8.30	750.581
Rec	9.56	554.695
INV	2.93	738.089
OPI	5.06	525.069

Note: TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV, and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets, and operating income to total assets.

Table 4 reports that F statistics and χ^2 statistics are significant in all variables at the 1% significance level. The results confirm the external validity of the study. Further, to check the multicollinearity, we performed a Pearson correlation. The results are reported in table 5.

Table 5: Model 1 Pearson Correlation

	<i>MAOP</i>	<i>MR</i>	<i>VR</i>	<i>NR</i>	<i>Ln_A</i>	<i>Loss</i>	<i>Rec</i>	<i>LEV</i>	<i>INV</i>	<i>OPI</i>	<i>STRG</i>	<i>ROA</i>	<i>Big4</i>
MAOP	1.00												
MR	0.001***	1.00											
VR	0.0123***	-0.07*	1.000										
NR	0.119	0.009*	0.010*	1.000									
Ln_A	0.215	0.006*	0.037*	0.007*	1.00								
Loss	0.019**	-	-	0.002*	-0.167	1.00							
Rec	0.019**	-	-	0.001*	-0.167	0.040**	1.000						
LEV	0.017**	-	-	-	-0.144	0.025**	0.184	1.000					
INV	0.040**	-	-	-	-0.169	0.024**	0.693	0.619	1.000				
OPI	-0.000***	-	-	-	-	-	0.001*	-	-	1.000			
STRG	-0.050**	0.064*	-	-	0.180	-0.019**	-	-	-	0.009*	1.000		
ROA	-0.007***	-	-	-	-	-	-	0.790	0.393	0.001*	-	1.00	
Big4	0.001***	0.007*	-	0.001*	0.221	-	-	-	-	0.001*	-	-	1.000

Note: *, ** *** Represent significance level at the 10, 5, and 1 percent, respectively. TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

Model 1 results indicate that the main variable voluntary audit firm rotation and mandatory audit firm rotation are positively correlated at the 1% significance level with the audit quality (MAOP). The loss, receivable (Rec), leverage (Lev), inventory (INV) and Big 4 are positively correlated with audit quality at the 5% significance level. Operating income (OPI) and return on assets are negatively correlated with audit quality at the 1% significance level. The result indicates that there is no serious multicollinearity problem. The Model 2 Pearson correlation results are reported in Table 6.

Table 6: Model 2 Pearson Correlation

	TBTD	VR	MR	NR	Ln_A	Loss	Rec	LEV	INV	OPI	STRG	ROA	Big4	MAOP
TBTD	1.00													
VR	-0.004**	1.00												
MR	0.010**	-0.067*	1.00											
NR	0.002**	0.137*	-0.037**	1.00										
Ln_A	0.015**	0.007***	0.019**	0.036**	1.00									
Loss	-0.029**	0.001***	0.017**	0.010***	0.082*	1.00								
Rec	-0.014**	0.003***	0.008***	0.001***	0.112	0.002***	1.00							
LEV	0.012**	0.001***	-0.007***	-0.004***	-0.138	0.017**	0.328	1.00						
INV	0.006**	0.003***	-0.002***	-0.004***	-0.094*	0.012***	0.142	0.546	1.00					
OPI	-0.033**	0.001***	0.001***	0.004***	-0.012**	0.001***	0.000***	-0.009***	-0.000	1.00				
STRG	-0.021**	0.052**	-0.008***	-0.023**	0.150	-0.005***	0.012***	0.027**	0.023**	0.010**	1.00			
ROA	0.006**	0.011***	-0.015***	-0.009**	-0.002**	-0.303	0.026**	0.004***	0.0007***	0.003**	-0.010**	1.00		
Big4	0.014**	0.004***	0.004***	0.001***	0.240	-0.008***	-0.016**	-0.022**	-0.001	0.001**	-0.014**	0.006**	1.00	
MAOP	0.013**	0.002***	0.008***	0.016**	-0.042**	0.147	-0.001***	0.001***	0.0002***	0.011**	0.006***	-0.011*	-0.0005***	1.00

Note: *, **, *** Represent significance level at the 10, 5, and 1 percent, respectively.

TBTD, PBTB, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

Table 6 reports the Model 2 Pearson correlation results. The results indicate that the main variables, no-audit firm rotation and mandatory audit firm rotation, are positively correlated at the 1% significance level with temporary book-tax differences. Another major variable, voluntary audit firm rotation, has a negative correlation with temporary book-tax differences (TBTD). Leverage (Lev), inventory (INV), return on assets (ROA), Big 4 and audit quality (MAOP) are positively correlated with temporary book-tax differences (TBTD) at the 1% significance level. Operating income (OPI), statutory change tax rate and receivable (Rec) are negatively correlated with temporary book-tax at the 5% significance level. The result shows that there is no serious problem of multicollinearity. The Model 3 Pearson correlation is reported in table 7.

Table 7: Model 3 Pearson Correlation

	<i>PBTD</i>	<i>VR</i>	<i>MR</i>	<i>NR</i>	<i>Ln_A</i>	<i>Loss</i>	<i>Rec</i>	<i>LEV</i>	<i>INV</i>	<i>OPI</i>	<i>STRG</i>	<i>ROA</i>	<i>Big4</i>	<i>MAOP</i>
<i>PBTD</i>	1.00													
<i>VR</i>	-	1.00												
	0.014**													
	*													
<i>MR</i>	-	-	1.00											
	0.002**	0.070												
	*	*												
<i>NR</i>	0.028**	-	-	1.00										
		0.140	0.041											
			**											
<i>Ln_A</i>	0.319	0.009	0.010	0.024	1.00									
		***	***	**										
<i>Loss</i>	-0.101	0.006	0.035	0.006	-0.153	1.00								
		***	**	***										
<i>Rec</i>	-	-	-	0.001	-0.167	0.040	1.00							
	0.007**	0.001	0.001	***		**								
	*	***	***											
<i>LEV</i>	0.001**	-	-	-	-0.144	0.025	0.184	1.00						
	*	0.006	0.001	0.004		**								
		***	***	***										
<i>INV</i>	-	-	-	-	-0.169	0.024	0.693	0.619	1.00					
	0.005**	0.006	0.001	0.005		**								
	*	***	***	***										
<i>OPI</i>	0.002**	-	-	-	-	0.001	-	-	1.00					
	*	0.005	0.004	0.001	0.016**	0.009	***	0.001	0.001					
		***	***	***		***		***	***					
<i>STRG</i>	0.032**	0.064	-	-	0.180	-	-	-	0.009*	1.00				
	*	*	0.024	0.049		0.019	0.010	0.011	0.006	**				
			**	**		**	***	**	***					
<i>ROA</i>	0.004**	-	-	-	-0.068*	-	-	0.793	0.393	-	-	1.00		
	*	0.004	0.001	0.002		0.006	0.017			0.001*	0.013*			
		***	***	***		***	**			**	*			
<i>Big4</i>	0.205	0.007	-	0.001	0.221	-	-	-	-	0.001*	-	0.001*	1.00	
		***	0.001	***		0.012	0.008	0.004	0.006	**	0.010*	**		
			***	***		***	**	***	***	**	**	**		
<i>MAOP</i>	-	0.003	0.012	0.015	-0.119	0.215	0.019	0.017	0.040	-	-	-	0.001*	1.00
	0.012**	***	***	***			**	**	**	0.000*	0.051*	0.111	**	
	*									**	*			

Note: *, **, *** Represent significance level at the 10, 5, and 1 percent, respectively.

TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

Table 7 reports the Model 3 Person correlation results. The result shows that the main variables, voluntary audit firm rotation and mandatory audit firm rotation, have a negative correlation at the 1% significance level with permanent book-tax differences. No-audit firm rotation has a positive correlation with permanent book-tax differences. Receivable, inventory and audit quality (MAOP) have a negative correlation at the 1% significance level with permanent book-tax differences. Leverage, operating income, statutory tax rate change and return on assets have a positive correlation at the 1% significance level with permanent book-tax differences. The results indicate that there is no serious problem of multicollinearity. In the next step, we applied the random effect model on all three models. The results are reported in Table 8.

The results shown in Table 8 reveal that the voluntary audit firm rotation and non-rotation have an independent variable effect on the audit quality as (mediator variable) in model 1 positively significant at the 10% significance level. Therefore, less voluntary audit firm rotation creates a lower modified auditor opinion and more voluntary audit rotation creates a higher modified auditor opinion. The findings of the voluntary audit firm rotation suggest that audit firm rotation has an association with audit reporting conservatism. According to M. Firth et al. (2012), voluntary rotation practices

enhance the audit quality when the audit firm market and financial incentives for creating or keeping good reputation and financial advantages result from agreeing to the demands of a special client. No-audit firm rotation represents an audit firm tenure of more than five years.

Table 8A: Results of direct and indirect relationship

<i>Variables</i>	<i>Model 1 Mediation</i>	<i>Model 2 TBTD</i>	<i>Model 3 PBTB</i>
MR	0.466 (0.005)	0.291 (-0.001)	0.729 (-4.101)
VR	0.060* (0.002)	0.823 (-0.000)	0.099* (-7.340)
NR	0.059* (0.007)	0.867 (0.001)	0.027** (1.420)
MAOP		0.053** (0.003)	0.131 (2.130)
Ln_A	0.000*** (0.008)	0.088* (0.001)	0.000*** (4.660)
ROA	0.010*** (-0.001)	0.929 (-0.001)	0.348 (-1.290)
Loss	0.000*** (0.081)	0.002*** (-0.001)	0.000*** (-3.830)
STRG	0.000*** (-0.001)	0.014*** (-0.001)	0.015*** (-9.560)
Big4	0.017** (0.015)	0.285 (0.001)	0.000*** (1.660)
SOE	0.007*** (-0.006)	0.292 (-0.001)	0.002*** (-1.120)
LEV	0.484 (3.990)	0.065* (0.001)	0.001*** (2.456)
Rec	0.000*** (0.001)	0.056* (-0.001)	0.001*** (2.250)
INV	0.000*** (0.001)	0.915 (-3.200)	0.506 (-6.780)
OPI	0.990 (1.250)	0.001*** (-4.440)	0.573 (0.009)
R-Square	0.501	0.310	0.351
N	13455	13455	13455

Note: *, **, *** Represent significance level at the 10, 5, and 1 percent, respectively.

TBTD, PBTB, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

Regarding the control variables result, return on assets (ROA), Statutory tax rate change (STRG) and state-owned enterprises (SOE) have a negative relationship at the 1% significance level with audit quality. This finding suggests that companies with the lower return on asset receive the more modified auditor opinion and those with high return on asset receive a low modified auditor opinion. After a change of the statutory tax rate from 33% to 25%, companies receive the low modified auditor opinion. State-owned enterprises findings suggest that SOEs receive less modified auditor opinions compared to non-state-owned enterprises. The size of the company (Ln_A), loss status and inventory to total assets have positively significance at the 5% significance level with modified auditor opinion. The findings suggest that large-sized companies have more modified opinions and small-sized companies have low modified opinions. When companies have a loss status, then they have more modified opinions. Model 2 results indicate the voluntary and no audit firm rotations (relation C in figure 1) do

not have a significant direct effect ($p > 0.823$ and 0.867), respectively, but modified auditor opinion has a positively significance at the 5% significance level with temporary book-tax differences. The findings of the study suggest that voluntary and no-audit firm rotation has no direct relation with temporary book-tax differences, but these audit firm rotations influence the temporary book-tax difference through modified audit opinion. The model 3 findings suggest that voluntary audit firm rotation has a significantly negative effect ($p > 0.099$) at the 10% significance level and no-audit firm rotation has a significantly positive effect ($p > 0.027$) at the 5% significance level has direct effect with permanent book-tax differences, but modified auditor opinion does not have a significant ($p < 0.131$) indirect effect on permanent book-tax differences. Findings suggest that voluntary and no-audit firm rotation has no indirect relation with permanent book-tax differences, but these audit firm rotations have a direct effect on permanent book-tax differences.

The Sobel–Goodman test was performed for an indirect relationship. Findings suggest that voluntary ($Z= 2.743$ $p= 0.006$) and no-audit firm rotation ($Z= 2.738$ $p=0.07$) have an indirect relationship with temporary book-tax differences through modified auditor opinion. By Following the Preacher & Hayes, (2008) and Zhao, Lynch, & Chen,(2010) study for the mediation effect of the modified auditor opinion between audit firm rotation and book tax differences, the Bootstrap test with 5000 bootstrap samples was performed. It represents the additional distribution sample. Findings suggest that the modified auditor opinion has a significantly positive, excluding zero (0.44, 0.660) and (0.56, 0.575), indirect effect on book-tax differences.

5.6. Robustness test

The random effect model has two major issues, serial correlation and heteroscedasticity. With the presence of these issues, standard error affects all the regression coefficients (Gujarati & Porter, 2003). The modified, the Wald test (Wooldridge, 2002) and (Greene, 2003) have been used to check the serial correlation and heteroscedasticity. The result shows that serial correlation and heteroscedasticity are present in the data. GLS was applied to remove the serial correlation and heteroscedasticity.

Table 8b: Result of robustness test

	<i>Model 1</i> <i>Mediation</i>	<i>Model 2</i> <i>TBTD</i>	<i>Model 3</i> <i>PBTD</i>
Heteroscedasticity	567895.86	646738.34	872397.11
Serial correlation	0.910	0.781	0.823

5.7. Additional Analysis

We performed several additional analyses. First, we analyzed the Big4 and non-Big4 auditors. Table 9 reports the Big4 and nonBig4 auditor's results. Model 1 presents the mediating variable results. The findings from model 1 indicate that mandatory, voluntary and no-audit firm rotation have a non-significant positive relationship with modified auditor opinion. Regarding the control variables size (Ln_A), loss, leverage (Lev), inventory (INV) have a significant positive relationship at the 5% significance level with the modified auditor opinion. Big4 model 2 indicates that audit quality (modified auditor opinion) has no significant represent the modified auditor opinion has no mediation effect on the relationship between the auditor firm rotation and temporary book-tax differences. A similar result shows that model 3 represents the modified auditor opinion has no mediation effect on the relationship with audit firm rotation and permanent book-tax differences.

Table 9: Results of Big4 and non-Big4

	<i>Big4</i>			<i>Non-Big 4</i>		
	<i>M 1</i> <i>Mediation</i>	<i>M 2</i> <i>TBTD</i>	<i>M 3</i> <i>PBTD</i>	<i>M 1</i> <i>Mediation</i>	<i>M 2</i> <i>TBTD</i>	<i>M 3</i> <i>PBTD</i>
MR	0.419 (0.006)	0.877 (0.001)	0.556 (-1.780)	0.376 (0.006)	0.285 (0.002)	0.835 (-1.310)
VR	0.384 (0.002)	0.207 (-0.001)	0.828 (-2.430)	0.079* (0.003)	0.918 (-0.001)	0.071* (-4.270)
NR	0.505 (0.016)	0.356 (0.002)	0.501 (1.100)	0.067* (0.007)	0.949 (0.001)	0.033** (7.320)
MAOP		0.659 (0.003)	0.624 (1.760)		0.048** (0.003)	0.069* 1.360
Ln_A	0.054** (-0.008)	0.632 (-0.001)	0.000*** (3.140)	0.000*** (-0.007)	0.054** (.001)	0.000*** (3.120)
ROA	0.858 (-0.002)	0.421 (0.001)	0.367 (6.990)	0.010*** (-0.001)	0.918 (-0.001)	0.323 (-0.711)
Loss	0.017** (0.075)	0.421 (0.002)	0.288 (-1.720)	0.000*** (0.081)	0.003*** (-0.002)	0.000*** (-3.700)
STRG	0.149 (-0.020)	0.011*** (-0.003)	0.358 (-8.890)	0.000*** (-0.009)	0.025** (-0.001)	0.088* (-3.560)
SOE	0.789 (-0.005)	0.028** (0.003)	0.356 (-1.090)	0.011*** (-0.005)	0.178 (-0.001)	0.211 (-2.420)
LEV	0.021** (-0.051)	0.316 (0.002)	0.136 2.290	0.493 (-3.920)	0.067* (0.001)	0.000*** (0.990)
Rec	0.783 (-0.029)	0.919 (0.001)	0.595 (-3.790)	0.000*** (-0.001)	0.060* (-0.001)	0.000*** (1.540)
INV	0.016** (0.069)	0.269 (-0.003)	0.157 (-2.740)	0.000*** (0.001)	0.945 (-2.090)	0.290 (-0.565)
OPI	0.563 (-4.970)	0.685 (2.701)	0.428 (-0.463)	0.922 (-1.040)	0.001*** (-4.510)	0.634 (0.004)
N	378	378	378	13076	13076	13076
R-sq	0.330	0.220	0.318	0.515	0.294	0.8173
Prob > chi2	0.000	0.000	0.001	0.001	0.001	0.000

Note: *, **, *** Represent significance level at the 10, 5, and 1 percent, respectively.

TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets.

The non-Big4 auditor's result are similar to the main models result. Non-Big4 auditor model 1 shows that the voluntary and no-audit firm rotation is positively significant at the 10% significance level. NonBig4 auditor's model 2 shows that the modified auditor opinion is significantly positive at the 5% significance level. It shows that the voluntary and no-audit firm rotation has a relationship with temporary book-tax differences through modified auditor opinion. The Model 3 results indicate that voluntary audit firm rotation is significantly negative at the 10% significance level and no-audit firm rotation is significantly positive at the 5% significance level with permanent book-tax differences. The modified auditor opinion is also significantly positive at the 10% significance level with permanent book-tax differences. Findings also suggest that permanent book-tax differences have no mediation effect on the relationship between audit firm rotation and book tax differences. The voluntary audit firm rotation has a negative relationship with permanent book tax differences. Further, no-audit firm rotation and modified auditor opinion has a positive relationship with permanent book-tax differences. Second, we separated the SOEs and non-SOEs samples and then applied the regression. The results are reported in table 10.

Table 10 Results of SOEs and non-SOEs

	SOEs			Non SOEs		
	<i>M 1</i> <i>Mediation</i>	<i>M 2</i> <i>TBTD</i>	<i>M 3</i> <i>PBTD</i>	<i>M1</i> <i>Mediation</i>	<i>M 2</i> <i>TBTD</i>	<i>M 3</i> <i>PBTD</i>
MR	0.673 (0.003)	0.692 (0.001)	0.663 (-8.610)	0.201 (0.018)	0.265 (0.002)	0.772 (-1.580)
VR	0.093* (0.001)	0.408 (-0.001)	0.177 (-1.110)	0.487 (0.003)	0.756 (0.001)	0.115 (-2.780)
NR	0.632 (0.002)	0.739 (0.001)	0.031** (2.470)	0.053** (0.013)	0.909 (-0.001)	0.700 (1.050)
MAOP		0.548 (-0.001)	0.228 (3.730)		0.012*** (0.005)	0.637 (-2.330)
Ln_A	0.000*** (-0.005)	0.129 (0.001)	0.000*** (6.660)	0.000*** (-0.009)	0.390 (0.001)	0.000*** (1.960)
ROA	0.000*** (-0.019)	0.537 (-0.001)	0.001*** (3.270)	0.157 (-0.001)	0.361 (0.002)	0.858 (-0.683)
Loss	0.000*** (0.054)	0.000*** (-0.002)	0.000*** (-5.050)	0.000*** (0.107)	0.872 (-0.001)	0.000*** (-2.100)
STRG	0.002*** (-0.008)	0.028** (-0.001)	0.019** (-1.640)	0.033** (-0.009)	0.190 (-0.001)	0.555 (-0.965)
Big4	0.056 (0.012)	0.537 (-0.001)	0.000*** (1.630)	0.126 (0.024)	0.370 (-0.002)	0.000*** (1.060)
LEV	0.000*** (-0.005)	0.562 (-0.001)	0.000*** (1.010)	0.004*** (-0.001)	0.083* (0.001)	0.002*** (0.853)
Rec	0.000*** (-0.005)	0.337 (-0.001)	0.187 (4.380)	0.003*** (-0.001)	0.125 (-0.001)	0.000*** (1.000)
INV	0.225 (-0.001)	0.142 (0.001)	0.000*** (-1.990)	0.000*** (0.001)	0.722 (-0.001)	0.504 (2.575)
OPI	0.360 (-0.008)	0.000*** (-7.910)	0.540 (-0.025)	0.786 (3.850)	0.079* (-3.000)	0.000*** (0.026)
N	6439	6439	6439	5839	5839	5839
R-sq	0.5882	0.3705	0.6748	0.5638	0.1522	0.2360
Prob > chi2	0.001	0.001	0.000	0.000	0.000	0.000

Note: *, **, *** Represent significance level at the 10, 5, and 1 percent, respectively.

TBTD, PBTD, MR, VR, NR, Ln_A, ROA, Loss, MAOP, STRG, Big4, SOE, LEV, Rec, INV and OPI represent respectively, temporary book tax differences, permanent book tax differences, mandatory rotation, voluntary rotation, no rotation, size of the company, return on assets, loss, modified auditor opinion, statutory tax rate change, Big 4, state owned enterprises, leverage, receivable to total assets, inventory to total assets and operating income to total assets

Table 10 shows the SOEs and non- SOEs results. First, SOEs model 1 results reveal that mandatory, voluntary and no-audit firm rotation have a non-significant positive relationship with the modified auditor opinion. SOEs model 2 indicates that audit quality (modified auditor opinion) does not significantly represent the modified auditor opinion and has no mediation effect in the relationship between auditor firm rotation and temporary book-tax differences. Similar results show the model 3 represents the modified auditor opinion has no mediation effect in the relationship with audit firm rotation and permanent book-tax differences. Second, non-SOEs results indicate that model 1, 2 and 3 results are consistent with the main model result, and voluntary and no audit firm rotation has a positive relationship with book-tax differences through modified auditor opinion.

5.8. Discussion

This study attempts to find the mediation effect of audit quality on the relationship between audit firm rotations and tax avoidance. Previous studies have ignored the auditor's behavior characteristics towards tax avoidance. This study used the unique Chinese data, modified auditor opinion as a proxy for audit quality and temporary and permanent book-tax differences for tax avoidance. Panel data

results show that modified auditor opinion has a mediation effect on the relationship between voluntary audit firm rotation and no-rotation with temporary book-tax differences.

China adopted the mandatory audit firm rotation rule for major state-owned enterprises (SOEs) in 2004. At the start of few companies were adopted this policy. In addition, in 2005 the SASAC (State-owned Assets supervision and administration commission of the state council) required all SOEs should be changed their audit firm with a new firm after five consecutive years (Firth et al., 2012). The findings of this study suggest that mandatory audit firm rotation has no indirect effect on temporary and permanent book-tax differences through modified auditor opinion. Mandatory audit firm rotation findings are in line with the Dopuch et al. (2001) study. This study findings suggest that audit quality improves in mandatory audit firm rotation as compared to non-mandatory audit firm rotation. Findings also suggests that mandatory rotation provides less probability that the auditor will become part of the tax avoidance strategies compared to voluntary auditor rotations. Additionally, voluntary and no-audit firm rotation has an indirect relationship with temporary book-tax differences by modified auditor opinion. These finding also support our hypothesis. These findings show that audit quality is low in a voluntary rotation. These findings are in line with the Frankel and Litov (2009) study. Frankel and Litov (2009) notes that low audit quality of the financial statement has a positive association with tax avoidance planning.

The no-audit firm rotation finding is similar to the voluntary audit firm rotation. Findings suggest that when auditors do not follow the mandatory rotation rule and serve more than five years then auditors are more familiar with client managers. IFAC (2003) stated that excessive familiarity between auditors and clients lead to auditors less self-satisfaction or reluctance to face the challenge appropriately therefore also decreases the level of skepticism. In addition, its effect the auditor's incremental learning with a passage of time. In this situation quality of audit decreases. This sign motivates the companies for great tax planning. So long-term auditor-client relationships allow for greater tax planning through tax expense. This study finding suggests that when auditors belong to Big4 firms, the mediation effect of modified auditor opinion in the relationship between audit firm rotations and permanent and temporary book-tax differences was not found. Our non-Big4 audit firm results are the same as the main model findings. International audit firm quality is higher than Chinese audit firm quality. Our findings also suggest that SOEs have no mediation effect on modified auditor opinion in the relationship between audit firm's rotation and book tax differences. The non-SOEs findings are similar to the main finding.

6. Conclusion

The aim of this study to identify the mediation effect of modified auditor opinion on the relationship between audit firm rotation and tax avoidance. Modified auditor opinion uses as a proxy for audit quality. The findings of the study suggest that mandatory audit firm rotation has no indirect effect on temporary and permanent book-tax differences through modified auditor opinion. Moreover, finding the voluntary and no-audit firm rotation have an indirect relationship with temporary book-tax differences through modified auditor opinion. Big4 audit firm rotation and SOEs finding suggest that mandatory, voluntary and no audit firms have no indirect effect on temporary and permanent book-tax differences via modified auditor opinion. Non-SOEs and non-Big 4 audit firm findings suggest that voluntary and no-audit firm rotation has an indirect relationship with a temporary book-tax difference.

This study contributes in the following ways. First, we use first time modified auditor opinion in tax research as a mediator on the relationship between audit firm rotation and tax avoidance. Second, this study extends the auditor behavior characteristic towards company tax avoidance strategies. Third, this study extends the Chen and Chu (2005) study with respect to auditor professional integrity towards tax avoidance. Fourth, this study extends the Big4 audit firm rotation literature with respect

to tax avoidance. Our findings suggest that Big4 auditors do not become the part of company tax avoidance strategy in China.

This study finding has an important recommendation for multinational firms, auditors, policy makers and financial report users. China has the second largest economy in the world. Whenever international investors enter in Chinese capital markets, they collect the information about auditors, and then mandatory auditor rotation plays a significant role in asymmetric information. Future research can investigate the other audit quality proxies as mediation effects on the relationship between audit firm rotation and tax avoidance.

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