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Two essays on the mitigating factors of corporate tax noncompliance

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TWO ESSAYS ON THE MITIGATING FACTORS OF CORPORATE
TAX NONCOMPLIANCE

LUO KIM WAN REBECCA

DOCTOR OF PHILOSOPHY

LINGNAN UNIVERSITY

2015

TWO ESSAYS ON THE MITIGATING FACTORS OF CORPORATE
TAX NONCOMPLIANCE

by
LUO Kim Wan Rebecca

A thesis
submitted in partial fulfillment
of the requirements for the Degree of
Doctor of Philosophy in Business
(Accountancy)

Lingnan University

2015

ABSTRACT

TWO ESSAYS ON THE MITIGATING FACTORS OF CORPORATE TAX NONCOMPLIANCE

by

LUO Kim Wan Rebecca

Doctor of Philosophy

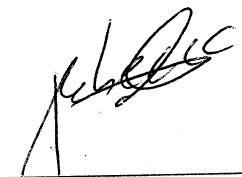
Corporate tax noncompliance is a serious problem in many developed and developing countries. My PhD thesis is composed of two essays to investigate various factors that mitigate corporate tax noncompliance by listed Chinese firms.

The first essay examines whether a firm's corporate tax noncompliance can be constrained by auditor quality. Past studies have shown that high-quality auditors are effective in reducing earnings management, which mainly involves overstatements of earnings. In this essay, I find that high-quality auditors are associated with better overall tax compliance by their client firms. In particular, high-quality auditors are effective in constraining book-tax-conforming noncompliance, which mainly involves understatements of both book and taxable income.

The second essay examines the tax noncompliance behavior of firms since the adoption of International Financial Reporting Standards (IFRS) in China, taking into account the influences of lower tax rates and more stringent tax enforcement. In recent years, many countries have moved away from tax-based accounting and toward adopting IFRS which increase tax noncompliance. At the same time, there has been a general reduction of corporate income tax rates as a means to increase tax competitiveness. Lower tax rates should be associated with decreases in tax noncompliance. Similarly, firms should be more tax compliant under a more stringent tax enforcement regime. In this essay, I find that the negative effect of book-tax delinking on tax noncompliance is significantly attenuated for firms that are subject to lower tax rates or more stringent tax enforcement measures. This essay also provides evidence that the effects of tax rates and of tax enforcement measures are more pronounced in the lower book-tax conformity period.

DECLARATION

I declare that this is an original work based primarily on my own research, and I warrant that all citations of previous research, published or unpublished, have been duly acknowledged.



LUO Kim Wan Rebecca
Date: 3 Aug 2015

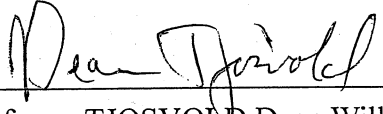
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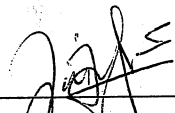
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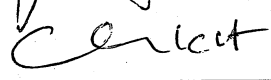
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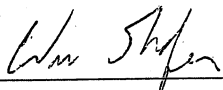
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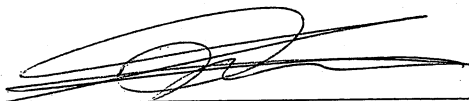
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SUMMARY OF THESIS

Tax noncompliance is a serious problem around the world, and various determinants of tax noncompliance need to be investigated. My thesis is composed of two essays, both of which investigate various factors that mitigate corporate tax noncompliance by listed Chinese firms. In my first essay, I examine the effect of auditor quality on constraining tax noncompliance. The second essay examines whether the use of lower corporate tax rates or more stringent tax enforcement measures is able to attenuate the negative effect of reduced book-tax conformity on tax noncompliance.

Specifically, the first essay examines whether high-quality auditors, independent of their provision of tax services, can constrain clients' tax noncompliance through their financial audits. I especially investigate the effect of high-quality auditors on book-tax-conforming noncompliance, which mainly involves understatements of both book and taxable income. I analyze 1,952 firm-year observations of listed companies in China from 1998 to 2003, and use tax audit adjustments as a direct measure to capture corporate tax noncompliance. Based on the empirical results, I find that high-quality auditors are associated with lower levels of total tax audit adjustments among client firms. Particularly, I find that firms audited by high-quality auditors have significantly lower book-tax-conforming adjustments than firms using low-quality auditors. This pattern holds in both higher and lower book-tax conformity periods. In extended analyses using sample firms in the 2008-2012 period, I find that firms using high-quality auditors and firms that switched from low- to high-quality auditors have better tax compliance. My findings are robust to a battery of sensitivity tests using various definitions of high-quality auditors and of tax noncompliance.

My essay complements past research on the constraining effect that auditors

have on earnings management which mainly involves overstatements in financial reporting. The results provide insights into how auditor quality can constrain overall tax noncompliance, especially book-tax-conforming noncompliance, which often results in financial statement misstatements. My finding that high-quality auditors are associated with lower levels of book-tax-conforming misstatements suggests that such auditors are effective not only for detecting overstatements of earnings, but also for constraining tax-motivated understatements of earnings. This effect of high-quality auditors adds further credibility to their fair presentations of financial position in financial statements.

The extant literature has focused on the benefits of adopting International Financial Reporting Standards (IFRS), including increased financial statement comparability and capital market effects. However, only a few studies have examined the effects of IFRS adoption on tax reporting behavior. My second essay takes the unique setting of China's convergence with the IFRS in 2007 to examine whether the adoption of lower tax rates and stricter tax enforcement measures reduce the negative effect that a decrease in book-tax conformity has on corporate tax noncompliance. The findings contribute to the taxation literature by identifying the comparative effects among these determinants of tax noncompliance.

In recent years, many countries have moved away from their tax-based accounting systems toward adopting the IFRS, which increases tax noncompliance due to a reduction in non-tax costs according to the book-tax trade off theory (book-tax delinking effect). Many governments have simultaneously reduced their corporate income tax rates as a means to increase their nations' tax competitiveness in the global market. A lower tax rate should be associated with reduced tax noncompliance. In other words, there should be a tax rate effect. Previous studies also

provide empirical evidence that firms are more tax compliant when tax enforcement becomes stricter (tax enforcement effect). Based on empirical data from Chinese listed firms between 2001 and 2012, I find that the application of lower tax rates can significantly reduce the negative effect that book-tax delinking has on tax noncompliance. The use of stricter tax enforcement measures also attenuates some of the negative effect that book-tax disconformity has on tax noncompliance. The empirical regression results suggest that lowering the tax rate is more effective than applying more stringent tax enforcement to mitigate this delinking effect. However, upon taking account of *both* the tax rate and tax enforcement effects, I find that a combination of these measures can *more than* offset the negative effect of delinking on tax noncompliance. I also find that the effects of both the tax rate reduction and tax enforcement increase significantly from the high- to the low- conformity levels. That is, both the tax rate effect and the tax enforcement effect are more pronounced when book-tax conformity is lower. These research findings are robust to various sensitivity tests.

This essay's results should be of real interest to regulators and policy makers in many countries, including those that have not yet decided to move toward adopting IFRS. The essay provides evidence that the application of lower tax rates and a stringent tax enforcement policy are both effective ways to mitigate tax noncompliance, particularly in the case of developing countries that are departing from tax-based accounting and gradually moving towards the adoption of IFRS.

Essay 1: The Constraining Effect of Auditor Quality on Corporate Tax Noncompliance

1.1 INTRODUCTION

Extant studies have shown that high-quality auditors can constrain a company's opportunistic earnings management (e.g., DeFond and Jiambalvo 1993; Kim, Chung, and Firth 2003; Badertscher, Phillips, Pincus, and Rego 2009; Reichelt and Wang 2010; Chen, Chen, Lobo, and Wang 2011; Christensen, Olson, and Omer 2015). Based on evidence from China, this essay examines whether high-quality auditors, through their financial audits, can also constrain a company's overall tax noncompliance, especially in terms of book-tax-conforming noncompliance, which involves understatements of both book and taxable income.

My study is motivated by concern about several characteristics of the Chinese regulatory environment that provide incentives for auditors to influence their clients' tax compliance. First, in China, financial statements must be restated when there is a material misstatement affecting both book and taxable income detected by tax authorities after a tax audit.¹ Restatement of financial statements is therefore an important measure of audit quality and an indicator of audit failure (Turner 1999; Liu, Raghunandan, and Rama 2009; Schmidt 2012). Reputable auditors should have a comparatively higher incentive to constrain their clients' improper or aggressive tax reportings that are linked to financial reportings. These auditors hope to avoid restatements that could damage their reputations, even if they are not directly engaged to prepare their clients' tax returns.

A second reason for such concern by auditors is the direct link in China between

¹ Indeed, significant book-tax-conforming misstatements (such as recognizing revenue sooner or later than would have been allowed under GAAP, committing cost-related improprieties, or improper treatment of tax liabilities, inadequate income tax reserves and other tax-related items) are the most frequently identified reasons for restatements of financial statements in the U.S. (GAO 2002).

the tax expenses reported in financial statements and the tax liabilities reported to the tax authorities (as is further explained later). Auditors that fail to detect and report significant understatements of tax expenses and tax liabilities can be readily identified and these auditors may be blacklisted or sanctioned by the regulatory authorities. Such sanctions are widely publicized and can result in damaged reputations for auditors.

A third reason for auditor concern is that aggressive tax reporting may result in substantial contingent tax liabilities. These liabilities can increase audit risk and affect the integrity of the overall governance environment. In addition, as most tax audit adjustments relate directly to noncompliance with tax laws, reputable brand-name auditors do not want to be affiliated with clients involved in significant illegal acts.

Given that auditors in China have clear motivations to constrain client firms' tax noncompliance, I hypothesize that high-quality auditors have a greater constraining effect on tax noncompliance than low-quality auditors, as high-quality auditors have more resources, greater expertise and are more concerned about reputation. Brand-name reputation is extremely important to high-quality auditors, as reputations are costly to build. Also, an audit firm's reputation is an important justification for charging higher audit fees, especially in a competitive audit market (Craswell, Francis, and Taylor 1995).

Starting from the late 1990s, China gradually moved away from its tax-based accounting system. Effective from 2001, China adopted the revised *Accounting Standards for Business Enterprises*, which marked a significant departure from a tax-based accounting system toward the adoption of International Financial Reporting Standards (IFRS) (Chan, Lin, and Mo 2010). This change has clearly reduced book-tax conformity and firms have had more opportunities to simultaneously

manipulate book and taxable income. This change in book-tax conformity provides a unique setting for an investigation into whether the constraining effect of high-quality auditors changes when book-tax conformity decreases from the pre-2001 period (i.e., 1998 to 2000) to the post-2001 period (i.e., 2001 to 2003).²

In response to this shift toward a different institutional setting, recent studies concerning the influence of auditors on tax reporting have focused on estimating the knowledge spillover effect of auditor-provided tax services on financial and tax reporting (e.g., Gleason and Mills 2011; Krishnan and Visvanathan 2011; McGuire, Omer, and Wang 2012; Donohoe and Knechel 2014). In this essay, I focus on investigating the constraining effect of high- versus low-quality auditors on clients' tax noncompliance which affects financial reporting, independent of whether they provide tax services. Concerns have been raised over whether auditor-provided tax services may jeopardize an auditor's independence in financial statement audits (e.g., Gleason and Mills 2011), and this setting allows me to assess the auditors' constraining effects on tax and financial reporting without potentially confounding the effects of knowledge spillover and independence impairment.

In this essay, I measure tax noncompliance directly by using the tax audit adjustments required by tax authorities (Mills 1998; Chan et al. 2010). Unlike other proxies used in past studies (Frank, Lynch, and Rego 2009; Hanlon and Heitzman 2010; Lisowsky 2010), tax audit adjustments measure the actual tax noncompliance of firms as detected by tax authorities in annual tax audits. Tax audit adjustments can

² The first stage of China's departure from tax-based accounting system began in 1998 (Chan et al. 2010). At that point, the Chinese government implemented a set of detailed operational accounting standards (the *Accounting Regulation for Listed Companies*), which formally recognized the need to relax the tax-based accounting principle. The gap between financial reporting and tax reporting began to widen. In 2001, China took another major step to further delink financial reporting from tax reporting. Chen, Sun, and Wang (2002) and Chen, Wang, and Zhao (2009) also use 2001 as a focal point to examine the effect of pre- versus post-policy changes on accounting practices in China. I confirm the decrease in conformity levels in my Research Method section (Sample Selection Subsection).

be classified as book-tax-conforming or as book-tax-difference audit adjustments. Book-tax-conforming adjustments are tax audit adjustments for misstatements that affect both book and taxable income, such as the under-reporting of sales revenue or over-reporting of cost of sales. These adjustments represent misstatements detected by the tax authorities that should have been detected by financial auditors. Book-tax-difference adjustments are revisions made due to misstatements of taxable income arising from violations such as claiming entertainment expenses in excess of the legal tax deduction limit, omitting taxable revenue that is recorded in the financial statements or claiming expenses that are not tax deductible. Unlike in situations involving book-tax-conforming misstatements, auditors are not normally expected to detect book-tax-difference misstatements, as they are not involved in preparing the clients' tax filings. Thus, I specifically focus on examining the constraining effect of auditor quality on firms' book-tax-conforming misstatements, in addition to studying the effect of auditor quality on total (overall) tax noncompliance.

I test two hypotheses by analyzing 1,952 firm-year observations of listed Chinese companies that were subject to annual tax audits by the tax authorities between 1998 and 2003. I measure auditor quality by the auditor locality and size of the audit firms. Non-local or large auditors are expected to provide higher quality audits than smaller or local auditors (DeAngelo 1981; Chan, Lin, and Mo 2006; Wang, Wong, and Xia 2008; Chan and Wu 2011). I use the proprietary tax audit database compiled by Chan et al. (2010) to identify overall tax audit adjustments and book-tax-conforming tax audit adjustments that were imposed on firms after their annual tax audits. In an extended analysis, I examine the effect of high-quality auditors on tax noncompliance among sample firms between 1998 and 2003 and between 2008 and 2012, based on effective tax rates (ETR). I also investigate the

effect of changes in auditors on tax noncompliance.

The results of this research are consistent with my hypothesis that high-quality auditors are associated with lower levels of total (overall) tax audit adjustments for client firms. In particular, I find that firms audited by high-quality auditors have significantly smaller book-tax-conforming adjustments than those audited by low-quality auditors during both the higher and lower conformity periods. In an extended analysis using sample firms between 2008 and 2012, I find that firms using high-quality auditors and firms that switch from low- to high-quality auditors have better tax compliance. My findings are robust to a battery of sensitivity tests using various definitions of high-quality auditors and of tax noncompliance.

This essay contributes to the literature by providing empirical evidence concerning the effect of auditor quality on clients' tax noncompliance through financial statement audits, independent of the provision of tax services. Past studies do not deal with the effect of differential auditor quality on tax noncompliance, nor do they investigate how the effect of auditor quality has changed between the two book-tax conformity periods (Gleason and Mills 2011; Seetharaman, Sun, and Wang 2011; Hanlon, Krishnan, and Mills 2012; Hogan and Noga 2012; Donohoe and Knechel 2014). My essay complements past research on the constraining effect of auditors on earnings management, which involves mainly overstatements in financial reporting (DeFond and Jiambalvo 1993; Francis, Maydew, and Sparks 1999; Kim et al. 2003; Badertscher et al. 2009; Reichelt and Wang 2010; Chen et al. 2011; Christensen et al. 2015). This essay provides insights concerning how auditor quality can also constrain overall tax noncompliance, in particular book-tax-conforming noncompliance, which often results in financial misstatements. Such misstatements commonly involve understatements of earnings. As firms generally do not have

incentives to understate book income, overstatements are much more common than understatements (Lennox and Li 2014). Auditors therefore often make less effort to detect understatements of revenue or overstatements of expenses. My finding that high-quality auditors are associated with lower levels of book-tax-conforming misstatements suggests these auditors are not only effective in detecting overstatement of earnings but also play an important role in constraining tax-motivated understatements of earnings. These efforts add further credibility to the fair presentation of financial position in financial statements.

My finding that the constraining effect of auditor quality on tax noncompliance is more significant at the lower book-tax conformity level suggests that high-quality auditors with more resources and better expertise are more able to constrain tax noncompliance than low-quality auditors when there are more opportunities for reporting irregularities. In fact, the move toward the use of IFRS reporting is an international trend, and China is not alone among transition economies in making such a move.³ My research results can therefore provide a useful reference to international investors and tax authorities in transition economies, especially those that are currently adopting IFRS, or are contemplating such a move. Specifically, my results highlight the need to improve auditor quality to accompany the move towards IFRS which reduces book-tax conformity. High-quality auditors help to ensure the fair presentation of financial statements and serve to constrain tax noncompliance,

³ Many transition economies such as China, Russia and Vietnam have departed from tax-based accounting toward the adoption of IFRS in recent years (Goncharov and Zimmermann 2006; Phuong and Richard 2011). In Russia, the IFRS was endorsed for use at the end of 2011 and become mandatory from 2012. Since then, the use of IFRS is required for the consolidated financial statements of all companies whose securities are publicly traded, and for all credit institutions or insurance companies, subject to certain exceptions. In Vietnam, although the IFRS have not been formally adopted so far, some Vietnamese companies prepare IFRS financial statements as supplementary statements for foreign investors, in addition to the financial statements prepared using Vietnamese Accounting Standards. During the 2001-2005 period, the Ministry of Finance of Vietnam gradually adopted IFRS by implementing a total of 26 IFRS-equivalent Vietnam Accounting Standards in five batches.

which is a serious problem that has not yet been adequately dealt in many transition economies, due to their insufficient institutional frameworks.

The remainder of this essay proceeds as follows. Section 1.2 describes the financial and tax audit environment in China. Section 1.3 reviews the relevant literature and develops the research hypotheses. Section 1.4 presents the research method. Section 1.5 discusses the empirical results, and the concluding remarks follow in Section 1.6.

1.2 INSTITUTIONAL BACKGROUND

1.2.1 The Financial Audit Environment in China

Most audit firms in China were initially established by government agencies, and these agencies frequently influenced audit firms' operations to help companies to meet various regulatory requirements (Lin and Chen 2004). The opening of the Shanghai and Shenzhen Stock Exchanges in the early 1990s accelerated the development of the auditing profession. In 1997, the Ministry of Finance and the China Securities Regulatory Commission (CSRC) issued regulations to disaffiliate audit firms from their sponsoring government agencies, in an attempt to improve auditor independence and audit quality. This disaffiliation program was completed in 1998. However, personal influence still exists between local government officials and local CPA firms, which often results in lower quality audits (Chan et al. 2006).

There is keen competition in China's audit market, with active participation by many small- and mid-size local audit firms and low market penetration by Big-N auditors (Li, Song, and Wong 2008). During my sample period from 1998 to 2003, the total market share of Big-5 audit firms in China was 27 percent (in terms of listed clients' total assets). In China's institutional setting, local auditors have greater

economic dependence on local clients than non-local auditors. Local auditors are also subject to more political influence from local governments (Chan et al. 2006; Wang et al. 2008). As most Chinese listed companies are sponsored or controlled by local governments, local auditors have strong incentives to be lenient and to report favorably on clients that are owned by local governments. Local auditors' lack of mobility and the narrow geographical dispersion of their clients further reduce their ability to resist pressure from their clients and local governments. This vulnerability to pressure affects the quality of their audits (Chan et al. 2006). Therefore, the quality of auditing offered by local and non-local auditors can be significantly different in China.

During my sample period, listed companies in China typically did not engage their audit firms to file tax returns, because their managers (being former officials of state-owned enterprises) believed that they were familiar with tax preparation work. Nevertheless, auditors were expected to conduct substantive audit work on tax-related accounts and disclosures including tax provisions to ensure the fair representation of tax-related accounts in the financial statements.

Chinese audit firms are subject to legal liabilities in case of audit failure. The sanctions they may face include administrative penalties, civil penalties and/or criminal charges. In 1995, China adopted a new set of auditing standards that closely follows the International Standards on Auditing. These new standards provide auditors with detailed rules for professional behavior, with penalties for noncompliance. In particular, auditors can be blacklisted and sanctioned by regulators for failing to detect and report a client firm's significant understatements of tax liabilities.⁴

⁴ For example, according to the Enforcement Release No. 27 (2008), issued by the China Securities

1.2.2 Tax Audits, Tax Avoidance and the Restatement of Financial Statements in China

In China, the calendar year is used for both financial and tax reporting purposes. Firms are required to submit audited financial statements and annual income tax returns to the local taxation authority within four months of the end of the year. As there is no difference in timing between the filings of audited financial statements and tax returns, there should be no significant uncertainty concerning the amounts of tax payable that are reported in financial statements. As China's tax system works on self-assessment, the tax authorities enforce compliance by carrying out post-assessment field audits (Chan et al. 2010). similar to the U.S., financial statements play an important role in the conduct of the tax audits by tax authorities (Graham, Raedy and Shackelford 2012).

In China, most listed companies are restructured from previous state-owned enterprises (SOEs). Generally, the productive operations of a firm to be listed are carved out, and the unprofitable operations remain with the parent SOEs (Deng, Gan, and He 2010). The government and the unlisted wholly state-owned parent companies retain substantial control of the listed SOE firms with regard to their operations and CEO appointments. These government-owned listed firms have various motives for avoiding taxes. Although some government-appointed managers may prefer to pay more taxes for the sake of their political career advancement, they generally need to maximize profits and cash flows to attract more outside capital investment to their

Regulatory Commission (CSRC), the Shenzhen Pengcheng CPA Co. Ltd. was sanctioned for not following appropriate audit procedures and failing to detect material misstatements in the financial statements of a listed company, namely the Hunan Hengyang Jinli Technology Agricultural Co. Ltd. (stock code: 600762) for the years 2002 and 2003. One of the material misstatements related to the overstatement of agricultural income eligible for income tax exemption (i.e., there was an understatement of taxable income) resulting in an under-reporting of income tax. The CSRC issued a warning and imposed a fine of RMB 100,000 on the Shenzhen Pengcheng CPA firm, with a fine of RMB 50,000 for each of its two responsible partners (CSRC 2008).

province or region. These firms must also meet certain performance standards to maintain their listing status, or to qualify for the right to issue additional shares. Some managers may even want to reserve more cash flow within the firms for their own use through tax avoidance.⁵ It should be noted that in China, the use of tax revenue collected by the government is subject to the strict supervision of the National People's Congress, whereas the use of any surplus kept within the firm is entirely at the discretion of corporate management. This consideration may motivate local governments to direct their firms to keep more surplus income within the firms, instead of paying more taxes. In addition, recent studies find that government-controlled listed firms have strong incentives to divert corporate resources, or to tunnel wealth back to their parent SOEs or other subsidiaries (Aharony, Wang, and Yuan 2010; Jiang, Lee, and Yue 2010; Lo, Wong, and Firth 2010; South China Morning Post 2013). To facilitate such diversions of corporate resources or retain more cash flow under their control, many listed firms adopt aggressive tax strategies.

Although the main focus of tax audits in the past has been on foreign companies and wealthy individuals, some listed companies (government- or non-government-owned) are also subject to periodic tax audits. According to the *Tax Yearbook of China* (published by the State Administration of Taxation), there were no changes in tax audit practices or audit rates for listed companies over our sample period (SAT 1998-2004). Also, there was no tax reform or significant change in tax

⁵ For example, the China National Audit Office (CNAO) conducted an audit on the financial reporting of China Ocean Shipping (Group) Company (COSCO group) and its affiliated companies in 2010. COSCO group is a government-owned enterprise that controls a number of companies, including China COSCO Holdings Company Ltd., which is listed on both the Shanghai Stock Exchange (stock code: 601919) and the Hong Kong Stock Exchange (stock code: 1919). According to the audit report, COSCO and its affiliated companies under-reported their operating revenue, which resulted in a tax underpayment of RMB 453 million (approximately US\$73.06 million) between 2004 and 2009 (CNAO 2011). The audit report also found that COSCO's management had misused company funds for employee bonuses and management salaries.

regulation during this period. However, Chan et al. (2010) show that tax noncompliance increased as book-tax conformity decreased during the 1998-2003 period.

In China, financial statements must be restated when there is a material book-tax-conforming tax audit adjustment imposed by the tax authorities after tax audit (SAT 1998). In addition, the *Accounting Standard for Business Enterprise No. 28*, “Changes in Accounting Policies, Accounting Estimates, and Corrections of Accounting Errors” (first promulgated in 1998) and a subsequent interpretation circular both require that material book-tax-conforming adjustments imposed by the tax authorities should be treated as *material* financial statement errors. Companies are required to make retrospective restatements to correct such errors, and to provide detailed disclosures of the reasons and amounts of adjustments in the financial statements in the year of discovery. A tabulated comparison must be included in the current financial report to show the pre- and post-adjustment effects on the accounts concerned for the relevant previous year(s). This tabulated report should include the book adjustments made to retained earnings brought forward, the opening balance of tax payable, income tax expenses, deferred tax accounts (if any) and reports on any other financial accounts that are linked with the tax misstatements. Furthermore, the auditors are required to issue a public announcement explaining the details of the misstatements and their effects on previously audited financial statements, with a statement of whether the restatements were made by their clients to comply with the Accounting Standards.

1.3 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1.3.1 The Influence of Auditors on Tax Noncompliance

Numerous studies have shown that high-quality auditors can constrain a company's earnings management (e.g., DeFond and Jiambalvo 1993; Francis et al. 1999; Kim et al. 2003; Badertscher et al. 2009, Reichelt and Wang 2010; Chen et al. 2011; Christensen et al. 2015). It is generally expected that high-quality auditors will conduct more substantive audit work to reduce the risk of audit failures, restatements of financial statements and exposure to litigation.

Past studies show that tax avoidance activities affect financial statements mainly via reductions in a firm's tax expenses (Maydew and Shackelford 2007).⁶ As the fair representation of tax expenses and related tax accruals affects the true and fair view of financial statements, auditors need to understand both the financial reporting standards and the tax laws that relate to their clients' tax strategies. If the tax strategy adopted by a client is so aggressive that it can trigger a tax audit and result in additional tax liabilities, the auditors should require the client to record a reasonably sufficient tax reserve or contingent liability to offset some or all of the associated benefits reported on the financial statements (Maydew and Shackelford 2007). In addition, if firms engage in tax-motivated earnings management by understating revenue or overstating expenses (i.e., book-tax-conforming misstatements), the effects on financial statements are more significant. Therefore, high-quality auditors who have more to lose in case of audit failure do not like to see their clients pursuing aggressive tax positions. This concern on the part of auditors reduces the likelihood of their clients' tax noncompliance (McGill 1988; Klepper, Mazur, and Nagin 1991).

During a financial statement audit, auditors review the company's material

⁶ Dhaliwal, Gleason, and Mills (2004) report that some firms use their tax expense account, based on their projected effective tax rate (ETR), to manage their fourth-quarter earnings (mainly upward) to meet earnings targets. Christensen et al. 2015 show that audit firms with industry expertise and/or tax expertise seek to constrain their clients' earnings management through complex tax expense account. However, these analyses do not deal with auditor quality, nor do they relate to tax noncompliance.

transactions that affect the calculation of both book income and taxable income. Specifically, in assessing the reasonableness of tax expenses and tax reserves, auditors need to review tax returns, working papers and correspondence with tax authorities (Gleason and Mills 2011). Auditors also need to review intercompany or related-party transactions, which often have important tax implications. Audit firms' tax experts are often involved in assisting audit engagement teams to assess the exposure of tax-related accounts as part of their audit procedures (McGuire et al. 2012). These and other standard audit procedures that auditors perform for tax-related accounts are normally specified in the audit program (PricewaterhouseCoopers-China 2012).

During our sample period, most listed companies in China adopted the tax payable method to account for income taxes. A few companies adopted the tax effect method, which recognizes the effect of timing differences on income tax. Under the tax payable method, a company recognizes its income tax expenses based on the taxable income for the current period, without taking into account the effect of timing differences. In other words, income tax expenses reported in the financial statements will be the same as the income tax payable reported to the tax authorities for the current period. Thus, book reporting and tax reporting conform with respect to the income tax amount. This distinctive accounting rule facilitates the auditing of income tax-related accounts, as there is no deferred tax involved. This conformity between income tax liability and income tax expense also allows the tax authorities to readily compare the tax liability reported in a tax return with the tax expense reported in a financial statement (which is attached to the tax return). As a significant difference between the two reports will certainly arouse the concern of the tax authorities, clients' tax reporting is inherently constrained by the auditor's assessment of tax-related

accounts in financial statements during the financial audit process. As high-quality auditors tend to be more risk averse, we should expect their clients to have better tax compliance.

The tax-related accounts in financial statements are informative for the tax authorities, and the reliability of these audited accounts can affect the depth of tax audits (Graham et al. 2012). There is evidence that users' perceptions of financial reporting reliability improve with higher-quality auditors (Balsam, Krishnan, and Yang 2003; Khurana and Raman 2004). When the tax authorities use audited book income and the associated tax account balances to assess their tax liabilities, they have more confidence in financial reports that are certified by high-quality auditors (Hanlon 2003; SAT 1993). In other words, the auditor's quality is one of the most important considerations for tax authorities in planning the scope of a tax audit. Thus, I expect firms audited by high-quality auditors to have lesser tax audit adjustments imposed by the tax authorities during annual tax audits.⁷

As explained earlier, material book-tax-conforming tax audit adjustments are regarded as material financial reporting misstatements. The respective accounts must be restated to correct such misstatements in the relevant years in accordance with the *Accounting Standard for Business Enterprises No. 28*. Frequent restatements lead to negative publicity, which can seriously damage the brand-name reputation of an auditor, and may trigger possible lawsuits or auditor switches. Past studies find that the auditor turnover rate is higher around restatements (e.g., Srinivasan 2005; Wallace 2005; Thompson and McCoy 2008; Hennes, Leone, and Miller 2014). Also, the development of brand-name reputation is costly, and the more reputable audit firms

⁷ On the other hand, to recover more tax revenues, some Chinese tax bureaus may seek to focus their audits on large firms that normally hire larger or higher-quality auditors. Indeed, many tax bureaus in major cities have a practice of auditing at least one large company per year. However, I believe that the overall effect of such a practice is not significant, given the size of the Chinese economy.

can charge systematically higher audit fees (Craswell et al. 1995). Beyond being driven by reputation concerns, high-quality auditors possess better abilities and resources for performing financial audits than local auditors. These qualities also contribute to their effect in constraining tax noncompliance, and particularly in minimizing their clients' book-tax-conforming misstatements. Thus, I formulate the first hypothesis as follows:

H1: Ceteris paribus, firms using high-quality auditors have lower levels of tax noncompliance, and especially for book-tax-conforming noncompliance, than firms that use low-quality auditors.

1.3.2 The Constraining Effect at Different Book-Tax Conformity Levels

Like many transition economies, China has gradually moved away from a tax-based accounting system toward adopting the IFRS. In a tax-based accounting system, book and taxable incomes are highly conformed. When the conformity level is high, it is likely that an auditor's detection of a book misstatement will correspondingly reduce the probability of a tax misstatement. As such, it is reasonable to expect that an auditor's influence on tax reporting will be more direct and pronounced in the higher conformity period than in the lower conformity period.

On the other hand, when the book-tax conformity level decreases, the book-tax differences increase, because there is less need for company management to make trade-offs between financial reporting and tax reporting incentives. In that situation, the company management has more opportunity to inflate book income and reduce taxable income at the same time.⁸ The auditor's role then becomes more important

⁸ For example, a company may use different sales cutoffs, asset useful life and salvage value, lease accounting or cost allocation methods for book and tax purposes. These differences could result in book-tax-conforming or book-tax-difference audit adjustments.

and more valuable for constraining opportunistic reporting behavior and reducing information risk. In other words, investors, lenders and governments tend to place more reliance on the auditor's efforts to identify and constrain the company management's noncompliance behavior when the book-tax conformity is reduced. In view of the increased probability of book and tax misstatements when the book-tax conformity is reduced, high-quality auditors need to be more alert than low-quality auditors. In a lower book-tax conformity period, they should devote more resources to conduct vigorous and comprehensive audit tests to mitigate the risks of audit failure and of damage to their brand-name reputation.

To summarize, it remains an empirical question whether auditor quality has a more apparent effect in constraining tax noncompliance at a higher or a lower conformity level. Hence, I formulate the second hypothesis as follows:

H2: There is a significant difference in the degree to which auditor quality has a constraining effect on tax noncompliance at different book-tax conformity levels.

1.4 RESEARCH METHOD

1.4.1 Sample Selection

To examine whether high-quality auditors can indeed constrain tax noncompliance and whether their constraining effect varies at different levels of book-tax conformity, I use the Chan et al. (2010) tax audit database, which includes information on the sample companies' book income, taxable income reported in tax returns (before tax audits) and details of tax audit adjustments during the 1998-2003 period. In addition to the total amount of tax audit adjustments, I identify and collect the book-tax-conforming adjustments of each company in the sample, based on

descriptions of the nature of individual tax audit adjustments. Compared with using the ETR as a proxy for a firm's *overall* tax noncompliance, the use of tax audit adjustments data allows me to more directly examine both the constraining effect of auditor quality on *overall* tax noncompliance and on *book-tax-conforming* noncompliance.

I collect financial statement data and other firm characteristics of the sample companies from the China Infobank database, the China Stock Market and Accounting Research database and the annual reports of the respective Chinese listed firms. I also collect auditor data from the China Infobank database, including auditor name, size, office location and type of audit opinions issued. Finally, I hand collect information regarding the political appointments of CEOs and General Managers of the sample firms from their annual reports.

I begin with 2,739 firm-year observations from the Chan et al. (2010) tax audit data for the 1998-2003 period. I choose to examine samples from 1998 onwards because those financial statements were audited by disaffiliated audit firms, as explained earlier. As China adopted new accounting standards in 2001 that further reduced book-tax conformity and moved toward the adoption of IFRS, the sample period in this essay covers three years before 2001 and three years after 2001, which allows me to test the proposed constraining effect at two different book-tax conformity levels. In the pre-2001 period, two sets of reporting rules were partially delinked, and then the delinking becomes more complete in post-2001 period. Atwood, Drake, and Myers (2010) measure the level of book-tax conformity by calculating the root mean squared error (RMSE) from a regression of current tax expense on pretax book income and dividends declared. A high RMSE indicates lower book-tax conformity. I estimate the RMSE measures for the sample firms in

each of the two conformity periods to validate the decrease in their levels of conformity. The results show that the level of RMSE increases from 0.0087 during the 1998-2000 period up to 0.0096 during the 2001-2003 period. A significant F-test rejects the null hypothesis of equal means at the 5 percent level.

As explained earlier, Chinese listed companies during my sample period did not typically engage their auditors for tax filing services. Discussions with CPA firm partners, corporate controllers and tax officials in China confirm this practice. I check the annual reports of the sample firms, and find that only a few of them paid a tax service fee to their auditors. I exclude 28 firm-years in which such fees were paid.⁹ Consistent with Mills (1998), I also exclude 447 firm-years with negative tax audit adjustments (or negative book-tax differences) to obtain more generalizable results.¹⁰ I delete 276 firm-years with missing corporate information such as independent director ratio or ownership details. Finally, I exclude 36 firm-years identified as outliers with standardized residuals for tax audit adjustments exceeding three standard deviations from the mean in absolute value. My final sample consists of 1,952 firm-year observations for the main regression models.

1.4.2 Specification of the Regression Models

To test the hypotheses, I develop the following two regression models (firm and time subscripts are suppressed for simplicity):

⁹ Auditors that also provide tax services are likely to be high-quality auditors. Due to the potential spillover effect, high-quality auditors that also provide tax services should be even more effective in constraining tax noncompliance than those that do not provide such services. Excluding those few cases from my analysis will only bias the results against my hypothesis that high-quality auditors constrain tax noncompliance. Including these observations in the regression does not change the significance of the test or the control variables as reported in Tables 3 and 4.

¹⁰ Negative adjustments represent special or peculiar situations for firms in terms of motives and reporting circumstances. Furthermore, firms with negative adjustments are tax compliant.

$$Tax_Adj (BTC_Adj) =$$

$$\begin{aligned} & \alpha_0 + \alpha_1 Aud_Quality + \alpha_2 Delink + \alpha_3 BT D + \alpha_4 Tax_Method + \alpha_5 DAccrual \\ & + \alpha_6 Opinion + \alpha_7 Exe_Shares + \alpha_8 Ownership + \alpha_9 Bshare + \alpha_{10} Overseas_Shares \\ & + \alpha_{11} Rights_Issue + \alpha_{12} ROE + \alpha_{13} Leverage + \alpha_{14} Age + \alpha_{15} Cosize \\ & + \alpha_{16} Political_Connection + \alpha_{17} Industry_dummies + \varepsilon \end{aligned} \quad (1)$$

$$Tax_Adj (BTC_Adj) =$$

$$\begin{aligned} & \beta_0 + \beta_1 Aud_Quality + \beta_2 Delink + \beta_3 Delink \times Aud_Quality + \beta_4 BT D \\ & + \beta_5 Tax_Method + \beta_6 DAccrual + \beta_7 Opinion + \beta_8 Exe_Shares + \beta_9 Ownership \\ & + \beta_{10} Bshare + \beta_{11} Overseas_Shares + \beta_{12} Rights_Issue + \beta_{13} ROE \\ & + \beta_{14} Leverage + \beta_{15} Age + \beta_{16} Cosize + \beta_{17} Political_Connection \\ & + \alpha_{18} Industry_dummies + \varepsilon \end{aligned} \quad (2)$$

1.4.2.1 Measures of Tax Noncompliance

Tax_Adj and *BTC_Adj* are the two direct measures used to capture overall tax noncompliance and book-tax-conforming noncompliance, respectively. I deflate *Tax_Adj* and *BTC_Adj* by sales revenue, as most of the tax noncompliance and the adjustments concern revenues or expenses that are related to the level of the firm's operating activities (Chan et al. 2010).¹¹ This deflation also allows for cross-sectional comparison and reduces heteroskedasticity in the data. As *Tax_Adj* and *BTC_Adj* are bound to fall between 0 and 1, we estimate the models by using a double-censored Tobit regression.

1.4.2.2 Measures of Auditor Quality

Auditor quality refers to the ability of auditors to detect misstatements and their willingness to report the misstatements they identify during the financial audits (DeAngelo 1981). Different proxies for auditor quality have been used in past studies. The most often used proxy is audit firm size (DeAngelo 1981; Palmrose 1988;

¹¹ Due to the small magnitude of tax adjustment relative to sales and the presence of some zero adjustment observations, I multiply the original variables by 100 instead of taking the natural logarithm for my regression analysis. In the sensitivity test, I exclude observations with zero adjustment, and then take the natural logarithm of audit adjustments as the dependent variable. The results are similar to those of the main regression (see Table 16).

DeFond and Jiambalvo 1993; DeFond, Wong, and Li. 2000; Choi and Wong 2007). However, Chan et al. (2006) and Wang et al. (2008) argue that auditor locality is a better measure of auditor quality in China's institutional environment. In view of the previous findings, I combine auditor locality and audit firm size as one measure of auditor quality. I code the variable *Aud_Quality* as 1 if a company is audited by either a non-local or a large auditor, and 0 otherwise.

Following Chan et al. (2006), I treat an audit firm as a local firm if it resides in the same jurisdiction (province or equivalent in China) as its client, and if more than 50 percent of its clients' total assets come from the same jurisdiction as the audit firm.¹² I follow past studies by using the market share of the year-end total listed client assets of the auditor to rank the audit firms according to size (DeFond et al. 2000; Reynolds and Francis 2001; Chan et al. 2006). As the Chinese audit market is dominated by small- and mid-size audit firms (with a low concentration of Big-5 auditors), during some years of the sample one or two of the Big-5 auditors were not included among the Top-10 firms. In considering that Big-5 firms provide a higher audit quality than others, I adopt a definition of large auditors that includes both the Top-5 Chinese audit firms and the Big-5 international firms. I expect non-local or large auditors to provide higher audit quality in financial audit engagements and to be better able to constrain tax noncompliance than small local auditors. Therefore, according to Hypothesis H1, I expect the coefficient α_1 to be negative.

1.4.2.3 Delink

¹² For audit firms with offices in different provinces, the 50 percent requirement for local auditor status is satisfied only if "every" office has local clients comprising over 50 percent of the office's clientele (i.e., over 50 percent of its clients' total assets come from clients in the same province where the respective office is located). If a firm has one office serving mainly local clients and one office serving mainly non-local clients, such firms are classified as non-local. This classification system is also used by Chan et al. (2006).

In 2001, China further departed from tax-based financial reporting and moved toward IFRS. When the rules governing the calculation of book income and taxable income become less conforming, firms are less tax compliant due to the lower non-tax costs for tax reporting manipulations (Chan et al. 2010). Accordingly, my sample observations should indicate more tax noncompliance in terms of larger tax audit adjustments in the post-2001 period than the pre-2001 period. I include the variable, *Delink*, to indicate the influence of the delinking of financial reporting rules from the tax rules on tax noncompliance. *Delink* is defined as 1 if the sample year is from 2001 to 2003, and 0 if the sample year is from 1998 to 2000. I expect the coefficient of the *Delink* variable to be positive.

I include an interaction term, *DelinkxAud_Quality*, in the tax noncompliance regression model of equation (2) to test Hypothesis H2. The coefficient β_3 measures the sensitivity of the constraining effect of auditor quality on tax audit adjustments as the book-tax conformity level decreases. If high-quality auditors are more alert and devote more resources to reduce misstatements after delinking, the sign of the coefficient of β_3 is expected to be negative.

1.4.2.4 Control Variables

In addition to the test variables, I include 14 firm characteristic variables in the regression models to control for their effects on a company's tax noncompliance behavior. First, I include book-tax differences, *BTD* (pretax book income minus taxable income deflated by sales), as these differences are expected to be positively associated with tax audit adjustments (Chan et al. 2010). I also include the variable *Tax_Method*, which is coded as 1 if a company adopts the tax payable method to account for income tax for financial reporting purposes, and 0 if a company adopts

the tax effect method. Due to the complexity involved in determining deferred taxes, I expect the use of the tax effect method to provide more opportunities for tax misreporting. Thus, the respective coefficient should be negative. To control for earnings management that may affect tax audit adjustments, I include *DAccrual* as a measure of earnings management. I calculate the signed discretionary accruals (*DAccrual*) based on the modified Jones (1991) model.

In China, all listed companies are required to submit audited financial statements together with their tax returns to the tax authorities. Financial reports with qualified audit opinions indicate that there are problems affecting the fair presentation of the companies' operating results and financial positions. The tax authorities use audited book income as a benchmark for the measurement of taxable income in determining whether companies are under-reporting (Hanlon 2003). Firms that receive qualified audit opinions may be suspected of corporate tax noncompliance.¹³ For firms with qualified audit opinions, the additional reputation cost of failing to detect tax reporting problems may be minimal, and so the auditors may limit their investment in scrutiny of these companies. Thus, I expect companies receiving unqualified audit opinions to have fewer tax audit adjustments than companies that receive qualified audit opinions. *Opinion* is coded as 1 if a company receives an unqualified audit opinion, and 0 otherwise. The regression coefficient on *Opinion* should thus be negative. Following previous empirical studies (DeFond et al. 2000; Chan et al. 2006), I classify audit opinions as "qualified" if they are unqualified with an explanatory paragraph, qualified, contain a disclaimer, or are adverse.

Erickson, Hanlon, and Maydew (2004) find that executives who are motivated

¹³ Graham et al. (2012) suggest that the contents of the tax accounts in financial statements affect the extent of the tax audit. Companies reporting low income tax expenses in their financial statements provide a red flag for the tax authorities.

by stock-based compensation schemes may be willing to pay taxes on overstated earnings to reduce the likelihood that their earnings manipulations can be detected. Desai and Dharmapala (2006) find that increases in incentive compensation for executives tend to reduce the level of tax sheltering. However, it is also possible that executives with a large percentage of shares may want to minimize tax payment as a means to maximize the after-tax dividend payout. Chinese companies seldom offer stock-based compensation to company executives. I thus use the percentage of shares held by executives (*Exe_Shares*) to capture the possible influence of executive compensation on tax noncompliance behavior.

Local government-owned companies generally have a weaker financial condition and less accountable corporate governance. Thus, they may have greater incentives for tax noncompliance to reduce their tax burdens and to reserve cash within the company for future uses (Chan et al. 2006). To control for the effect of such government ownership on tax noncompliance, I include a dummy variable, *Ownership*, which equals 1 if a company is non-local-government owned, and 0 otherwise. I follow the same classification as Chan et al. (2006), and identify a firm as local government owned if the largest shareholder is a local government entity that owns at least 20 percent of the shares. I expect the relationship between the *Ownership* variable and the tax noncompliance measures to be negative.

Companies with B-shares (shares sold only to foreign investors) and with shares listed on overseas stock exchanges normally have overseas operations. These firms are more likely to engage tax noncompliance, as they have more opportunities for designing tax schemes among their different affiliated companies. However, the presence of foreign investors also commonly brings in new management methods and better internal control systems that may reduce noncompliance. I include two

variables, *Bshares* and *Overseas_Shares*, to control for these effects. Also, Chinese firms need to meet certain performance standards before they can issue additional shares. Therefore, rights offering firms may be motivated to report high book earnings to meet those regulatory requirements. These firms are therefore less likely to make tax-motivated misstatements than their counterparts (Chan et al. 2010). However, Shelvin, Tang, and Wilson (2012) find that rights offering firms often engage in greater intra-group income shifting as a way to lower their taxes and increase their after-tax book earnings for meeting minimum earnings thresholds. Thus, I include *Rights_Issue* to control for this effect.

I include *ROE* (return on equity) to control for the effect of profitability on tax noncompliance. Companies with a low *ROE* are more likely to be susceptible to cash constraints over time, and they may be less tax compliant. I include *Leverage* (total debts divided by total assets) to control for the effect that a company's borrowings have on tax noncompliance. Highly leveraged firms may have a greater need to inflate book income to meet their debt covenant requirements. However, Graham and Tucker (2006) and Lisowsky (2010) find that tax shelter firms have a lower leverage than their counterparts. Older firms are also more likely to become susceptible to cash constraints after they go public, and they tend to be less compliant with tax regulations (Murray 1995; Chen, Chen, and Su 2001). However, older firms may have built up strong reputations over time, and as such they can be more tax compliant to protect their brand-name reputations. I include a continuous variable, *Age* (number of years a firm has operated since its initial public offering), to control for this effect.

Chan et al. (2010) find that large firms are more tax compliant because of the political costs they face, and because they have more resources to devise and execute

undetected tax avoidance strategies. I include the variable *Cosize* to control for any effect of company size. Also, the amount of tax adjustment imposed by tax authorities may be affected by a firm's power to negotiate. Therefore I include a dummy variable, *Political_Connection*, which equals 1 if the firm's CEO and General Manager have political appointments, to control for the effect of negotiation ability. In China, most of these political appointments come from local governments. I expect *Political_Connection* to be negatively associated with the level of tax audit adjustments. Finally, I incorporate a set of eleven dummy variables for different industries (*Industry*) to control for any industry effects on tax noncompliance.

1.4.3 Selection Bias

Company managers select their preferred auditors according to firm characteristics and other unobserved variables. These variables may cause a potential self-selection bias in my regression models if I ignore the issue of non-random selection of auditors (Maddala 1991). I therefore adopt a two-stage method (Heckman 1976) to address the self-selection bias of auditor choice. First, I use the following probit regression model to estimate a company's choice among auditors having different levels of quality.

$$\begin{aligned}
 \text{Aud_Quality} = & \theta_0 + \theta_1 \text{Delink} + \theta_2 \text{BTD} + \theta_3 \text{Tax_Method} + \theta_4 \text{DAccrual} + \theta_5 \text{Ex_Opinion} \\
 & + \theta_6 \text{Market_Index} + \theta_7 \text{Indirratio} + \theta_8 \text{Exe_Shares} + \theta_9 \text{Ownership} \\
 & + \theta_{10} \text{Bshare} + \theta_{11} \text{Overseas_Shares} + \theta_{12} \text{Rights_Issue} + \theta_{13} \text{ROE} \\
 & + \theta_{14} \text{Leverage} + \theta_{15} \text{Current_Ratio} + \theta_{16} \text{Age} + \theta_{17} \text{Cosize} \\
 & + \theta_{18} \text{Political_Connection} + \theta_{19} \text{Industry_dummies} + \varepsilon
 \end{aligned} \tag{3}$$

In addition to the variables in equation (1), I also include two exogenous variables that are expected to affect management's selection of auditors.¹⁴ I include a

¹⁴ It should be noted that I use the previous year's audit opinion (*Ex_Opinion*) in model (3), but the current year's audit opinion (*Opinion*) in models (1) and (2), as it is more logical that auditor choice is affected by the previous year's audit opinion. Deleting the opinion variable in all three models does not affect the main research results.

variable, *Market_Index*, to reflect the development of market intermediaries and the legal environment (Fan and Wang 1998-2006). The higher the index, the more developed the market. I expect that in well-developed localities, the business and legal environment is more complicated, and listed companies are more likely to engage higher-quality auditors for their financial statement audits. Therefore, the sign of the *Market_Index* coefficient should be positive. I also add the variable of *Current_Ratio* (year-end current assets to current liabilities) to the auditor selection model, because the financial liquidity of a firm is expected to affect its financial ability to engage a higher-quality auditor.¹⁵ I also include the control variable of *Indirratio* (the ratio of the number of independent directors to the total number of board members) to control for the influence of corporate governance. It should be noted that audit fees may also affect a firm's choice of auditor. However, audit fee data were not available before 2001 in China. Thus, I follow Chen, Sun and Wu (2010) in using company size to proxy for the effect of audit fees on auditor choice as a control in model (3). In the second stage, I perform the Tobit regression on the tax noncompliance models of equations (1) and (2) with the inclusion of $\lambda_{audit_quality}$, which is the selection bias correction variable. All of the variables are defined in Appendix 1.

[Insert Appendix 1 about here]

1.5 EMPIRICAL RESULTS

1.5.1 Descriptive Statistics and Univariate Tests

Table 1 presents the descriptive statistics and univariate tests on the tax

¹⁵ The exogenous variables of *Market_Index* and *Current_Ratio* are both statistically justified to satisfy the exclusion restriction principle. These variables affect managers' auditor choice decisions directly (i.e., the first-stage model) but they have no direct effect on the second-stage dependent variable.

noncompliance measures and corporate characteristics of the sample firms. Firms audited by high-quality auditors have smaller total tax audit adjustments and book-tax-conforming tax audit adjustments, smaller book-tax differences, a lower percentage of executive shares, are more likely to be non-local-government owned and are more likely to have foreign shareholders and overseas listings than their counterparts. Furthermore, these firms tend to be older, larger and to have fewer political appointments from local governments. As shown in Appendix 2, all of the correlation coefficients among the variables are well below 0.50, except the correlation between *Age* and *Delink* (0.58). None of the variance-inflation factors exceed 10, which is the point beyond which the threat of multicollinearity becomes a concern (Greene 2008). Therefore, multicollinearity does not seem to be a problem in our multivariate regression analysis as discussed below.

[Insert Table 1 and Appendix 2 about here]

1.5.2 Multivariate Tests

Table 2 presents the results of our stage-one estimation of auditor selection by sample firms. An area under the ROC curve of 0.8083 indicates that the first stage is well specified to deal with the endogeneity problem. I find that companies in the lower conformity period (*Delink*), with a lower book-tax difference (*BTD*), located in provinces with more developed market intermediaries (*MKT_Index*), with lower executive shareholdings (*Exe_Shares*), having foreign shareholders (*Bshares*) or overseas listings (*Overseas_Shares*) and a higher current ratio (*Current_Ratio*) exhibit a significantly higher tendency to choose high-quality auditors than their counterparts. However, companies having more political connections with mainly local governments are less likely to choose high-quality auditors (Chan et al. 2006;

Wang et al. 2008).

The first-stage results support the expected significant positive relationship between the two instrumental variables (i.e., *Market_Index* and *Current_Ratio*) and auditor choice. This result indicates that both variables have direct effects on a firm's auditor choice (statistically significant with *p*-value at the 1 percent and 5 percent levels, respectively). To provide assurance that these two variables have no direct effect on tax noncompliance (i.e., the second-stage regression), I run an additional analysis to regress the error term from the second-stage Tobit regression models (i.e., models 1 and 2) on these two instrumental variables and on all of the other independent variables used in the first-stage test (Lennox, Francis, and Wang 2012). The results show that *Market_Index* and *Current_Ratio* are both statistically insignificant. This finding suggests that the exclusion restriction principle is satisfied, and that these instrumental variables are valid for the Heckman test.

[Insert Table 2 about here]

Table 3 presents the stage-two Tobit regression results for the two tax noncompliance models based on 1,952 firm-year observations.¹⁶ The coefficient on *Aud_Quality* is negative and significant for the two tax audit adjustment models (*Tax_Adj* and *BTC_Adj*). These results support my Hypothesis H1 that high-quality auditors have a constraining effect on firms' tax noncompliance. The auditor quality is expected to affect the depth of tax audits, as mentioned earlier. The State

¹⁶ My sample includes firms that are selected for tax audits. Tax authorities do not audit every listed company. To the extent that audit adjustments are conditional on a tax return being selected for an audit, the inference concerning the effect of audit quality on audit adjustments could be biased. However, based on the same data set, Chan et al. (2010) find no such selection bias.

Furthermore, in my extended analysis, which includes both audited and non-audited firms, I find the results (as shown in Table 5, using differential ETR as a dependent variable) to be consistent with my main regression results, based on measuring tax noncompliance by the variables of audited firms using tax audit adjustment (Table 3) and differential ETR (Table 15).

Administration of Taxation has issued various tax circulars to announce the implementation procedures for tax audits (SAT 1993, 2009, 2012). Based on the guiding principles specified in these circulars regarding the selection of tax audit samples, it is not expected that the auditor's quality significantly affects the likelihood that a firm will have a tax audit (Chan, Chau, and Leung 2013).¹⁷ However, even if the tax authorities are less likely to choose firms audited by high-quality auditors as their tax audit targets, and if this leads to a negative association between audit quality and tax audit adjustment, this explanation still suggests the important role of high-quality auditors in constraining tax noncompliance.

Table 4 shows the regression results with the inclusion of the interaction term *DelinkxAud_Quality* to test whether high- and low-quality auditors have significantly different effects in constraining tax noncompliance at different levels of book-tax conformity. As shown in the table, the coefficients on *Aud_Quality* are negative for both the *Tax_Adj* and *BTC_Adj* models, but are significant only for the *BTC_Adj* model. This result indicates that during the higher book-tax conformity period, auditor quality has a significant constraining effect only on book-tax-conforming audit adjustments. The coefficients on *DelinkxAud_Quality* are also negative, but not significant for either model. However the respective sum of the coefficients (*Aud_Quality* + *DelinkxAud_Quality*) for the two models is negatively significant,

¹⁷ Tax audits are usually carried out by independent tax investigation teams representing the tax authorities. Selection is based on certain criteria such as the taxpayer's financial and tax characteristics (e.g., firms with large operational scale, firms that report drastic changes in earnings, firms that report tax payable incompatible with firm size), industry characteristics (e.g., firms that report low profit margins relative to their industry average), and ownership type. Another possibility of becoming an audit target is through an informer (SAT 1993, 2009).

The SAT announces its tax audit plan each year by issuing a tax circular to the local tax authorities. For example, in January 2012, the SAT released a tax audit work plan which laid down the scope for national tax audits and investigations for that year (SAT 2012). The circular summarized the guidelines regarding the criteria for selecting audit targets and audit procedures. The tax audit targets for 2012 primarily included firms in certain types of industries (e.g., real estate, construction and installation industries), regions, and some large-scale state-owned enterprises (which represented major sources of tax revenue in their respective regions).

which suggests that high-quality auditors have a significant constraining effect on both total noncompliance and specifically book-tax-conforming noncompliance during the lower book-tax conformity period.¹⁸ To the extent that high-quality auditors have a significant constraining effect on total tax adjustments in the lower conformity period, but not in the higher conformity period, this finding provides support for Hypothesis H2. The constraining effect clearly differs at different levels of book-tax conformity. The sensitivity tests to be discussed later provide further support for Hypothesis H2.

To summarize, the results shown in Tables 3 and 4 provide evidence that high-quality auditors have a significant constraining effect on total (overall) tax noncompliance. In particular, the effect on book-tax-conforming misstatements is significant at both conformity levels. As high-quality auditors are more concerned about the risks of financial statements restatements and of damage to their long-established brand-name reputations, they have incentives to reduce book-tax-conforming misstatements at all times. The economic differences of using high-quality versus low-quality auditors in reducing *BTC_Adj* in the high (i.e. 1998-2000) and the low (i.e. 2001-2003) conformity period are respectively RMB 0.75 million (about US\$0.12 million) and RMB 1.11 million (about US\$0.18 million) per firm-year on average.¹⁹ Overall, these findings suggest that the need to avoid restatements of financial statements, the need to maintain brand-name reputation and the differential in auditors' resources are the main factors that explain the significance of auditor quality in constraining book-tax-conforming noncompliance at all

¹⁸ I exclude 108 firm-year observations that show a loss position, and re-run the analysis. The Tobit regression results are comparable to the main regression results given in Tables 3 and 4, i.e., there is no change in the expected direction or significance of the test variables.

¹⁹ The averages of sales for my sample firms during the high and low conformity periods are RMB 4,580 million (about US\$747 million) and RMB 6,420 million (about US\$1,048 million), respectively.

conformity levels.

[Insert Table 3 and Table 4 about here]

Regarding the control variables, Tables 3 and 4 show that firms with larger *BTD* have more tax noncompliance, as is consistent with the results of Chan et al. (2010). In addition, firms with more executive shareholdings (*Exe_Shares*), higher leverage (*Leverage*) and larger size (*Cosize*) have significantly smaller tax audit adjustments (per dollar of assets) than their counterparts. Larger companies are more tax compliant than smaller companies, because of the political costs they face for noncompliance. Large firms are also better able to have their tax avoidance strategies go undetected, because they have more resources to do so (Mills 1998).

1.5.3 Additional Test for an Extended Sample Period (2008-2012)

Thus far, I have focused my analyses on the years surrounding the point of change in book-tax conformity (2001). By focusing on this period, I have sought to address the effect of book-tax conformity on the relation between auditor quality and tax compliance. To further examine the effect of auditor quality on tax compliance in a more recent period, I use the sample data from 2008 to 2012 (the period following the 2008 tax rate reform in China) to replicate the analysis given in Table 3.²⁰ In this replicated analysis, the *Delink* and *Tax_Method* variables are not included, as there is no change in book-tax conformity, and as all firms must use the tax effect method during this period. Also, I use ETR to proxy for the extent of tax noncompliance.²¹

Given the variations in applicable statutory tax rates within China due to various

²⁰ Consistent with my main tests shown in Tables 3 and 4, I exclude 74 firm-year observations that have auditor-provided tax services. Including those observations in the regression does not change the significance of the test or the control variables as reported in Table 5.

²¹ The tax audit adjustments data used in the main analysis are from the proprietary dataset of Chan et al. (2010). This proprietary dataset does not cover the period from 2008 to 2012. Therefore, I rely on publicly available financial data to calculate the effective tax rates as a proxy for tax noncompliance.

preferential tax policies, a low ETR may be due to the granting of a preferential tax rate. To ensure that a low ETR is not due to a low statutory tax rate (STR), I use the differential effective tax rate ($Diff_ETR = STR - ETR$) as the dependent variable in my analysis. STR is the statutory tax rate applicable to a given firm. The ETR is calculated as corporate tax expenses divided by pre-tax book profits, whereas the applicable STR is extracted from the annual reports (Hanlon and Heitzman 2010). I have excluded those firm years with negative tax expenses or negative taxable income to obtain more generalizable results. A large $Diff_ETR$ suggests aggressive tax reporting, which is indicative of tax noncompliance.

The results given in Table 5 show that the coefficient on $Aud_Quality$ is significantly negative, which indicates that the use of high-quality auditors results in a smaller $Diff_ETR$. In other words, firms with high-quality auditors are more tax compliant in the extended sample period from 2008 to 2012. As $Diff_ETR$ is a measure of the firms' overall tax noncompliance, this result is consistent with the main test findings for Tax_Adj shown in Table 3, and indicates that high-quality auditors can effectively constrain total tax noncompliance. In considering that the extended period (2008-2012) is a lower book-tax conformity period, the results shown in Table 5 are also consistent with those in Table 4, which indicate that high-quality auditors have a significant constraining effect on the total tax noncompliance in lower conformity periods (2001-2003 for the main test, and 2008-2012 for the extended period). The results using $Diff_ETR$ to proxy for overall tax noncompliance give further support to Hypothesis H1.

[Insert Table 5 about here]

1.5.4 The Effect of a Change in Auditor Quality on Tax Noncompliance

To provide further evidence in support of the main test results (that auditor quality has a constraining effect on tax noncompliance by client firms), I conduct an auditor change analysis to test whether a change from a low- to a high-quality auditor results in better tax compliance in the years following the auditor change. As I do not have sufficient auditor change data for the original dataset (sample period 1998-2003), I conduct this test only for the extended sample period (2008-2012).

I define a change from a low- to a high-quality auditor as a switch from either (i) a local to a non-local auditor (with less than 50 percent client assets concentration), or (ii) from a small to a large auditor (a Top-5 Chinese or a Big-5 firm). During the extended period, there are 163 firms that switch from low- to high-quality auditors. Based on these “good-switch” firms, I construct a sample of 489 firm-years, with observations one year prior to the change and for the two years subsequent to the change. I use a dummy variable, *Auditor_Change*, to test the effect of such a change in auditor quality on *Diff_ETR*. *Auditor_Change* is coded 1 if the firm-year is either the first or the second year subsequent to a “good auditor” switch, and 0 otherwise. Consistent with my expectation, the results in Table 6 show that the coefficient on *Auditor_Change* is significantly negative, which indicates that a switch from a low-quality to a high-quality auditor results in less tax noncompliance.

I further conduct a test to examine whether a “bad auditor” switch from a high- to a low-quality auditor, results in higher tax noncompliance in the years following the auditor change (during the extended sample period of 2008-2012). As with the “good auditor” switches discussed above, I define a change from a high- to a low-quality auditor as a switch from either (i) a non-local auditor (with less than 50 percent client assets concentration) to a local auditor; or (ii) from a large (Top-5

Chinese or Big-5 firm) to a small auditor. During the extended period, there are 111 firms that switch from high- to low-quality auditors. Based on these “bad-switch” firms, I construct a sample of 333 firm-years, with observations one year prior to the change and two years subsequent to the change. *Auditor_Change* is coded 1 if the firm-year is either the first or the second year subsequent to a “bad-auditor” switch, and 0 otherwise. The results given in Table 7 show that the coefficient on *Auditor_Change* is significantly positive, indicating that a downward switch from a high-quality to a low-quality auditor results in more tax noncompliance.

Taking the results of “good” and “bad” switches together, these two auditor change tests provide compelling evidence that high-quality auditors do have a better constraining effect on clients’ tax noncompliance.

[Insert Table 6 and Table 7 about here]

1.5.5 Robustness Tests

I conduct a battery of sensitivity tests to examine the robustness of these research results as follows.

1.5.5.1 Propensity Matched-Pair Samples

As the Heckman two-step correction method for self-selection bias may be sensitive to model specification (Clatworthy, Makepeace, and Peel 2009; Lennox et al. 2012), I use the propensity matched-pair sample method as an alternative way to resolve the self-selection problem. Following Lawrence, Minutti-Meza, and Zhang (2011), I use the nearest neighbor matching method to generate a propensity matched-pair sample based on the predicted probabilities from the auditor choice model (i.e., equation 3).²²

²² I implement the following rules to match the companies that choose high-quality auditors with those that choose low-quality auditors: (1) If only one of the two companies adjacent to a company that

As shown in Table 8, there is no significant difference in the firm characteristics of the matched-pair sample between firms that choose high-quality or low-quality auditors. Using this matched-pair sample of 816 observations, I re-run the Tobit regressions on the main tax compliance models shown in Table 4. The results, given in Table 9, indicate that high-quality auditors have a significant constraining effect on book-tax-conforming adjustments in the lower book-tax conformity period, and this result is not related to firm-characteristics. Again, this result further supports Hypothesis H1.

[Insert Table 8 and Table 9 about here]

1.5.5.2 Alternative Measures of Auditor Quality, Book-Tax Conformity Level and Tax Noncompliance

I also conduct sensitivity tests by varying the definition of auditor quality (i.e., auditor locality and auditor size) for the *Tax_Adj* and *BTC_Adj* models. First, I re-run the regression models using an alternative definition of local auditor. I treat an audit firm as a *local firm* if that firm resides in the same jurisdiction as the client, and if more than 20 percent (instead of 50 percent as in our main regression) of the total client assets come from the same jurisdiction as the audit firm. This modification raises the standard for high-quality auditors. Table 10 shows that the results are largely similar to the main regression results given in Table 4.

Second, I apply a more stringent standard by redefining high-quality auditors as those that are both non-local (with less than 50 percent client assets concentration) AND Top-5 or Big-5 audit firms. The results given in Table 11 show that the coefficients of *Aud_Quality* are significantly negative for the two tax adjustment

chooses a high-quality auditor chooses a low-quality auditor, then it is chosen as a match. (2) If both adjacent companies choose low-quality auditors, then we choose the company with the closest estimated probability. (3) If there is no company that chooses a high-quality auditor adjacent to a company that chooses a low-quality auditor, then it is dropped.

models in both the higher and the lower book-tax conformity periods. These results indicate that auditor quality is negatively associated with all types of tax noncompliance at all conformity levels.

Third, I use an alternative definition of auditor size. Instead of classifying the Top-5 Chinese firms plus the Big-5 international firms as large auditors, I expand the definition to include the Top-10 Chinese firms plus the Big-5. Thus, high-quality auditors are defined as either non-local or as either a Top-10 plus Big-5 audit firm. This modification lowers the standard for designating high-quality auditors. The results shown in Table 12 indicate that the high-quality auditors have a significant constraining effect in reducing only book-tax-conforming adjustments in the low conformity period.

Fourth, I use auditor locality (local vs. non-local) as the only measure for auditor quality. I define high-quality auditors as those that are non-local (that have less than 50 percent client concentration in the province). The results shown in Table 13 indicate that high-quality auditors have a significant constraining effect on tax audit adjustments in both the lower and the higher conformity periods (like in the results shown in Table 11). I then use auditor size as the only proxy for auditor quality. As shown in Table 14, the results indicate that large auditors also has a significant constraining effect only on total tax audit adjustments in the lower conformity period.

Taking the results shown in Tables 13 and 14 together with my main results in Table 4, it appears that audit firm size is less able to discriminate auditor quality than auditor locality. As Big-5 firms have a relatively small market share in China, the market for large auditors is dominated by the Top-5 Chinese audit firms (Big-5: 20 percent vs. Top-5: 80 percent). Over the sample period, most clients of the Chinese Top-5 audit firms were audited by a Top-5 firm that was classified as a local auditor

(non-local: 28 percent vs. local: 72 percent). It should be noted that according to Chan et al. (2006), the same audit firm can be classified as local or non-local, depending on whether that audit firm is in the same jurisdiction as the client, and whether it has a concentration of clients in that jurisdiction. Due to the influence of local governments in China, large local Chinese auditors may not necessarily provide high-quality audits (Chan et al. 2006). This factor explains the weak constraining effect of large auditors as shown in Table 14. However, when high-quality auditors are defined as non-local auditors only, the measure of audit quality is not diluted by the effect of large local auditors, resulting in more significant constraining effects than those shown in the main results (in Table 4).

As an alternative measure of tax noncompliance, I use the differential ETR (discussed earlier) as the dependent variable to replicate Table 4 for the 1998-2003 sample period. The results given in Table 15 show that high-quality auditors have a significant constraining effect on noncompliance in the lower conformity period, as is consistent with the results based on tax audit adjustments during the same sample period (in Table 4). These findings reinforce both Hypotheses H1 and H2. Furthermore, my results are robust when I take the natural logarithm of tax audit adjustments (after deleting all zero adjustments) as a dependent variable. The results of this test are presented in Table 16.

Finally, I use the measure of *RMSE* to replace the variable *Delink* to capture the high vs. low book-tax conformity level during the sample years. Table 17 indicates that the regression results are largely similar to the main regression results shown in Table 4.

It is also interesting to observe that for all of the sensitivity tests included in Tables 10 to 17, the coefficients of the interaction term (*DelinkxAud_Quality*) are all

negative, and are significant for Tables 10, 14, 15 and 16. These results provide further support for Hypothesis H2, that the constraining effect of high-quality auditors differs in different conformity periods (with a stronger effect in the low conformity period).

[Insert Table 10 to Table 17 about here]

1.6 CONCLUSIONS

This essay examines whether auditor quality can contribute to constraining corporate tax noncompliance, independent of the provision of tax services. To my knowledge, this is the first study to examine the effect of differential auditor quality on a firm's tax compliance. Based on a unique dataset of firms' total tax noncompliance and book-tax-conforming noncompliance as detected by the Chinese tax authorities, I find that high-quality auditors play an effective role in constraining their client firms' total (overall) tax noncompliance, which can contribute to the fair presentation of tax expenses in financial statements. The results also indicate that the constraining effect of auditor quality on overall noncompliance is more apparent in the lower book-tax conformity period, while the effect on book-tax-conforming noncompliance is significant at all times (i.e., at all book-tax conformity levels). The prevention of book-tax-conforming noncompliance is important, as this kind of noncompliance can lead to restatements of relevant financial statement accounts if detected by the tax authorities. In addition, a switch from a low- to a high-quality auditor improves tax compliance.

To maintain their brand-name reputations in a competitive audit market, high-quality auditors devote more resources and effort to detecting misstatements in financial statements, including tax-motivated understatements of earnings. Future

research may explore further conditions under which high-quality auditors are associated with better tax compliance. For example, it may be interesting to investigate how foreign shareholders (*Bshares*) and overseas listings (*Overseas_Shares*) affect an auditor's performance in relation to tax compliance, as these two variables are both significant in the extended period.

For fiscal, social or economic reasons, tax authorities around the world are trying their best to improve tax compliance. This essay provides evidence that high-quality auditors can help to constrain tax noncompliance. Tax authorities can use auditor quality as a signal for tax compliance in selecting tax audit targets, whereas investors can rely on auditor quality as a constraint for tax noncompliance in assessing potential tax liability, investment risk and returns. Finally, many countries, including transition economies such as Russia and Vietnam, are moving toward the full adoption of IFRS (from a tax-based accounting system), which will reduce the level of book-tax conformity. My essay indicates that in cases where book-tax conformity is reduced, high-quality auditors will be even more essential in constraining tax noncompliance, and particularly for book-tax-conforming noncompliance.

TABLE 1
Descriptive Statistics of the Sample Firms (1998-2003)
(n=1,952)

	High-Quality Auditor (n=981)	Low-Quality Auditor (n=971)	Test of Mean Differences	
	Mean (Standard Deviation)	Mean (Standard Deviation)	t-statistic	p-value
<i>Tax_Adj</i>	0.0039 (0.0057)	0.0048 (0.0082)	-3.12	0.002 ***
<i>BTC_Adj</i>	0.0004 (0.0007)	0.0007 (0.0014)	-4.78	0.000 ***
<i>BTD</i>	0.0963 (0.1224)	0.1241 (0.2537)	-3.07	0.002 ***
<i>Tax_Method</i>	0.9776 (0.1481)	0.9835 (0.1274)	-0.95	0.342
<i>DAccrual</i>	0.0050 (0.0894)	-0.0002 (0.0836)	1.33	0.183
<i>Opinion</i>	0.9103 (0.2859)	0.8939 (0.3081)	1.22	0.224
<i>Exe_Shares</i>	0.0179 (0.0418)	0.0255 (0.0724)	-2.82	0.005 ***
<i>Ownership</i>	0.1346 (0.3414)	0.0906 (0.2872)	3.08	0.002 ***
<i>Bshares</i>	0.1019 (0.3027)	0.0669 (0.2500)	2.78	0.005 ***
<i>Overseas_Shares</i>	0.0418 (0.2002)	0.0051 (0.0716)	5.39	0.000 ***
<i>Rights_Issue</i>	0.2080 (0.4061)	0.2235 (0.4168)	-0.83	0.404
<i>ROE</i>	0.0642 (0.1791)	0.0564 (0.3555)	0.61	0.539
<i>Leverage</i>	0.4443 (0.1790)	0.4326 (0.1811)	1.44	0.151
<i>Age</i>	5.7428 (2.3314)	5.0627 (2.4490)	6.28	0.000 ***
<i>Cosize</i>	11.8054 (0.8669)	11.7177 (0.7924)	2.33	0.020 **
<i>Political_Connection</i>	0.3609 (0.4805)	0.4305 (0.4954)	-3.15	0.002 ***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. All variables are defined in Appendix 1.

TABLE 2
Probit Estimation on the Selection of Auditors by Client Firms (n=1,952)

Variables	Expected Sign	Coefficient	z-statistic
<i>Constant</i>		0.338	0.563
<i>Delink</i>	+	0.271***	2.989
<i>BTD</i>	-	-0.548***	-3.108
<i>Tax_Method</i>	?	0.072	0.311
<i>DAccrual</i>	?	0.644	1.868
<i>Ex_Opinion</i>	+	-0.161	-1.606
<i>Market_Index</i>	+	0.052***	3.430
<i>Indirratio</i>	+	0.183	0.568
<i>Exe_Shares</i>	?	-1.331**	-2.469
<i>Ownership</i>	+	0.180	1.850
<i>Bshares</i>	+	0.262**	2.296
<i>Overseas_Shares</i>	+	1.232***	4.699
<i>Rights_Issue</i>	?	-0.017	-0.237
<i>ROE</i>	+	0.181	1.256
<i>Leverage</i>	?	0.326	1.561
<i>Current_Ratio</i>	+	0.058**	2.299
<i>Age</i>	?	0.010	0.561
<i>Cosize</i>	+	-0.064	-1.548
<i>Political_Connection</i>	-	-0.143**	-2.351
<i>Industry dummies</i>	Included, but not reported for brevity		
<i>Wald χ^2</i>	177.84***		
<i>Area under ROC curve</i>	0.8083		

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The dependent variable *Aud_Quality* is coded as 1 if a company is audited by either a non-local (less than 50 percent client assets concentration) or a large auditor (i.e., a Top-5 Chinese or a Big-5 international audit firm), and 0 otherwise. *Industry* is a set of 11 dummy variables for different industries. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow, Ormazabal, and Taylor 2010).

TABLE 3
The Effect of Auditor Quality on Tax Noncompliance

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	3.176*** (10.038)	0.527*** (9.355)
<i>Aud_Quality</i>	-	-0.070** (-2.573)	-0.017*** (-3.566)
<i>Delink</i>	+	0.123** (2.254)	0.007 (0.749)
<i>BTD</i>	+	0.547** (2.546)	0.044 (1.695)
<i>Tax_Method</i>	-	-0.189 (-1.933)	-0.015 (-1.455)
<i>DAccrual</i>	?	0.221 (1.084)	0.003 (0.102)
<i>Opinion</i>	-	-0.075 (-1.205)	-0.008 (-0.731)
<i>Exe_Shares</i>	?	-1.164*** (-4.381)	-0.049 (-1.456)
<i>Ownership</i>	-	-0.004 (-0.093)	-0.010 (-1.661)
<i>Bshares</i>	?	0.082 (1.207)	0.003 (0.304)
<i>Overseas_Shares</i>	?	0.150 (1.033)	-0.005 (-0.278)
<i>Rights_Issue</i>	?	-0.032 (-1.079)	-0.006 (-1.323)
<i>ROE</i>	-	-0.028 (-0.329)	-0.012 (-0.931)
<i>Leverage</i>	?	-0.197** (-2.285)	-0.026** (-2.021)
<i>Age</i>	?	0.005 (0.537)	-0.003** (-1.969)
<i>Cosize</i>	-	-0.242*** (-9.482)	-0.033*** (-7.947)
<i>Political_Connection</i>	-	-0.021 (-0.577)	0.007 (1.078)
$\lambda_{audit_quality}$?	0.322 (1.656)	0.014 (0.519)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.648***	9.185***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. In columns (1) and (2), the dependent variables are total audit adjustments (*Tax_Adj*) and book-tax-conforming audit adjustments (*BTC_adj*), respectively. *Aud_Quality* equals 1 if the auditor is either a non-local or a large auditor, and 0 otherwise. $\lambda_{audit_quality}$ is the selectivity correction variable from the *Aud_Quality* selection equation. *Industry* is a set of eleven dummy variables for different industries. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 4
The Effect of Auditor Quality on Tax Noncompliance in Different Book-Tax Conformity Periods

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	3.122*** (9.738)	0.527*** (9.258)
<i>Aud_Quality</i>	-	-0.020 (-0.591)	-0.016** (-2.377)
<i>Delink</i>	+	0.193*** (2.699)	0.007 (0.574)
<i>DelinkxAud_Quality</i>	?	-0.122 (-1.958)	-0.001 (-0.110)
<i>BTD</i>	+	0.525** (2.445)	0.044 (1.676)
<i>Tax_Method</i>	-	-0.182 (-1.856)	-0.015 (-1.437)
<i>DAccrual</i>	?	0.227 (1.115)	0.003 (0.104)
<i>Opinion</i>	-	-0.079 (-1.275)	-0.008 (-0.731)
<i>Exe_Shares</i>	?	-1.176*** (-4.419)	-0.049 (-1.457)
<i>Ownership</i>	-	-0.002 (-0.050)	-0.010 (-1.646)
<i>Bshares</i>	?	0.084 (1.245)	0.003 (0.303)
<i>Overseas_Shares</i>	?	0.158 (1.080)	-0.005 (-0.273)
<i>Rights_Issue</i>	?	-0.032 (-1.084)	-0.006 (-1.323)
<i>ROE</i>	-	-0.023 (-0.272)	-0.012 (-0.928)
<i>Leverage</i>	?	-0.196** (-2.272)	-0.026** (-2.022)
<i>Age</i>	?	0.004 (0.451)	-0.003 (-1.957)
<i>Cosize</i>	-	-0.241*** (-9.469)	-0.033*** (-7.947)
<i>Political_Connection</i>	-	-0.024 (-0.645)	0.007 (1.066)
$\lambda_{audit_quality}$?	0.340 (1.726)	0.015 (0.517)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.69***	8.92***
<i>Aud_Quality +</i>	-	-0.142***	-0.017***
<i>DelinkxAud_Quality</i>		(-2.900)	(-2.850)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 5
The Effect of Auditor Quality on Tax Noncompliance for the Extended
Sample Period (2008-2012)

n=4,265	Expected Sign	<i>DV= Diff_ETR</i> Coeff/(t-statistic)
<i>Constant</i>	?	0.153** (2.252)
<i>Aud_Quality</i>	-	-0.009** (-2.309)
<i>BTD</i>	+	0.003 (0.416)
<i>DAccrual</i>	?	0.003 (0.131)
<i>Opinion</i>	-	-0.016 (-1.219)
<i>Exe_Shares</i>	?	-0.001*** (-6.401)
<i>Ownership</i>	-	-0.004 (-1.058)
<i>Bshares</i>	?	0.021** (1.985)
<i>Overseas_Shares</i>	?	0.046*** (2.853)
<i>Rights_Issue</i>	?	-0.015*** (-3.419)
<i>ROE</i>	-	-0.279*** (-11.457)
<i>Leverage</i>	?	0.075*** (7.799)
<i>Age</i>	?	0.003*** (8.328)
<i>Cosize</i>	-	-0.006** (-2.237)
<i>Political_Connection</i>	-	-0.007 (-1.888)
$\lambda_{audit_quality}$?	0.072*** (3.252)
<i>Industry dummies</i>		Included, but not reported for brevity
F value		29.569***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.

The dependent variable, *Diff_ETR*, is the difference between the statutory tax rate (STR) and the effective tax rate (ETR). The ETR is calculated as corporate tax expenses divided by pre-tax book profits (Hanlon and Heitzman 2010).

“High-quality auditor” is defined as an auditor that is non-local (with a less than 50 percent client assets concentration) or a large auditor (a Top-5 Chinese or a Big-5 firm).

Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 6
The Effect of an Auditor Change (from a Low-Quality to a High-Quality Auditor) on
Tax Noncompliance in the Extended Sample Period (2008-2012)

n=489	Expected Sign	DV= <i>Diff_ETR</i> Coeff/(t-statistic)
<i>Constant</i>		0.421*** (4.627)
<i>Auditor_Change</i>	-	-0.020** (-2.068)
<i>BTD</i>	+	0.004 (0.312)
<i>DAccrual</i>	?	0.028 (0.505)
<i>Opinion</i>	-	-0.035 (-1.450)
<i>Exe_Shares</i>	?	-0.001** (-2.501)
<i>Ownership</i>	-	-0.013 (-1.441)
<i>Bshares</i>	?	-0.029 (-1.448)
<i>Overseas_Shares</i>	?	0.034 (1.002)
<i>Rights_Issue</i>	?	-0.013 (-1.142)
<i>ROE</i>	-	-0.221*** (-4.781)
<i>Leverage</i>	?	0.034** (1.990)
<i>Age</i>	?	0.006*** (5.773)
<i>Cosize</i>	-	-0.016*** (-3.398)
<i>Political_Connection</i>	-	-0.004 (-0.423)
<i>Industry dummies</i>	?	Included, but not reported for brevity
F value		7.850***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.

The dependent variable is the differential effective tax rate (*Diff_ETR*), as defined in Table 5.

A change from a low- to a high-quality auditor is defined as a switch from (i) a local to a non-local auditor (with less than a 50 percent client assets concentration) or (ii) a small to a large auditor (a Top-5 Chinese or a Big-5 firm).

Auditor_Change is defined as 1 if the firm-year observation is subsequent to the auditor change, and 0 otherwise.

Other variables are as defined in Appendix 1.

Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 7
The Effect of an Auditor Change (from a High-Quality to a Low-Quality Auditor) on Tax Noncompliance in the Extended Sample Period (2008-2012)

n=333	Expected Sign	DV= <i>Diff_ETR</i> Coeff/(t-statistic)
<i>Constant</i>		0.506*** (4.742)
<i>Auditor_Change</i>	+	0.019* (1.836)
<i>BTD</i>	+	-0.019 (-1.017)
<i>DAccrual</i>	?	-0.058 (-1.132)
<i>Opinion</i>	-	-0.077*** (-3.419)
<i>Exe_Shares</i>	?	-0.029 (-0.735)
<i>Ownership</i>	-	-0.016 (-1.448)
<i>Bshares</i>	?	0.042* (1.704)
<i>Overseas_Shares</i>	?	0.015 (0.367)
<i>Rights_Issue</i>	?	-0.014 (-0.940)
<i>ROE</i>	-	-0.011 (-1.227)
<i>Leverage</i>	?	0.012 (0.623)
<i>Age</i>	?	0.004*** (3.290)
<i>Cosize</i>	-	-0.021*** (-4.625)
<i>Political_Connection</i>	-	0.005 (0.446)
<i>Industry dummies</i>	?	Included, but not reported for brevity
F value		6.170***

***, ** and * indicate two-tailed significance at the 1 percent, 5 percent and 10 percent levels, respectively.

The dependent variable is the differential effective tax rate (*Diff_ETR*), as defined in Table 5.

A change from a high- to a low-quality auditor is defined as a switch from (i) a non-local auditor (with a less than 50 percent client assets concentration) to a local auditor; or (ii) a large (a Top-5 Chinese or a Big-5 firm) to a small auditor.

Auditor_Change is defined as 1 if the firm-year observation is subsequent to the auditor change, and 0 otherwise.

Other variables are defined in Appendix 1.

Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 8
Descriptive Statistics on Firm Characteristics for the Propensity Matched-Pair Sample
(Sample Period 1998-2003)

	High-Quality auditor (n=408)	Low-Quality Auditor (n=408)	Test of Mean Differences	
	Mean (Standard Deviation)	Mean (Standard Deviation)	t-statistic	p-value
<i>BTD</i>	0.0949 (0.1062)	0.0883 (0.1417)	0.75	0.452
<i>Tax_Method</i>	0.9902 (0.0986)	0.9853 (0.1205)	0.64	0.525
<i>DAccrual</i>	0.0074 (0.0858)	0.0047 (0.0735)	0.47	0.640
<i>Opinion</i>	0.9142 (0.2804)	0.8922 (0.3106)	1.06	0.287
<i>Exe_Shares</i>	0.0207 (0.0417)	0.0177 (0.0498)	0.94	0.348
<i>Ownership</i>	0.0931 (0.2910)	0.1029 (0.3043)	-0.47	0.638
<i>Bshares</i>	0.0784 (0.2692)	0.0833 (0.2767)	-0.26	0.798
<i>Overseas_Shares</i>	0.0000 (0.0000)	0.000 (0.0000)	0.00	---
<i>Rights_Issue</i>	0.2353 (0.4247)	0.2059 (0.4048)	1.01	0.312
<i>ROE</i>	0.0602 (0.2363)	0.0670 (0.1097)	-0.52	0.599
<i>Leverage</i>	0.4361 (0.1633)	0.4502 (0.1794)	-1.18	0.239
<i>Age</i>	5.3947 (2.0797)	5.2555 (2.1955)	0.93	0.353
<i>Cosize</i>	11.7182 (0.8022)	11.7449 (0.7525)	-0.49	0.624
<i>Political_Connect ion</i>	0.4044 (0.4914)	0.4167 (0.4936)	-0.36	0.722

Note: This table shows the corporate characteristics of the propensity matched-pair sample firms. The univariate tests indicate that there is no significant difference in firm characteristics between firms using high-quality and low-quality auditors.

TABLE 9
The Effect of Auditor Quality on Tax Noncompliance Using the
Propensity Matched-Pair Sample (1998-2003)

(n=816)	Expected Sign	<i>Tax_Adj</i> Coeff/(t-statistic)	<i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>		3.331*** (6.567)	0.511*** (5.758)
<i>Aud_Quality</i>	-	0.068 (1.321)	-0.004 (-0.500)
<i>Delink</i>	+	0.128 (1.623)	0.022 (1.248)
<i>DelinkxAud_Quality</i>	?	-0.121 (-1.279)	-0.020 (-1.303)
<i>BTD</i>	+	0.857*** (2.914)	0.019 (0.796)
<i>Tax_Method</i>	-	-0.035 (-0.276)	-0.021 (-0.700)
<i>DAccrual</i>	?	0.344 (0.882)	0.013 (0.422)
<i>Opinion</i>	-	-0.085 (-0.983)	-0.001 (-0.119)
<i>Exe_Shares</i>	?	-1.701*** (-3.640)	-0.078 (-1.828)
<i>Ownership</i>	-	-0.048 (-0.833)	-0.001 (-0.166)
<i>Bshares</i>	?	0.053 (0.708)	0.009 (0.523)
<i>Rights_Issue</i>	?	0.032 (0.649)	-0.006 (-1.119)
<i>ROE</i>	-	-0.089 (-0.669)	-0.050 (-1.414)
<i>Leverage</i>	?	-0.111 (-0.889)	-0.043*** (-2.809)
<i>Age</i>	?	-0.001 (-0.061)	-0.005 (-1.753)
<i>Cosize</i>	-	-0.251*** (-6.190)	-0.028*** (-5.022)
<i>Political_Connection</i>	-	0.028 (0.608)	0.009 (1.107)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		5.025***	5.533***
<i>Aud_Quality +</i>	-	-0.0538	-0.0239**
<i>DelinkxAud_Quality</i>		(-0.70)	(-2.13)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent, respectively.

Standard errors are clustered by both firm and year (Gow et al. 2010).

Note: The variable *Overseas_Shares* is not included in this model, as no firm in the matched-pair sample has an overseas listing.

TABLE 10
Other Sensitivity Tests (Sample Period 1998-2003)

A “high-quality auditor” is a non-local auditor (with a less than 20 percent client assets concentration) or a large auditor (a Top-5 Chinese or a Big-5 firm)

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	3.209*** (9.984)	0.530*** (8.951)
<i>Aud_Quality</i>	-	-0.004 (-0.127)	-0.014** (-2.133)
<i>Delink</i>	+	0.198** (2.510)	0.008 (0.540)
<i>DelinkxAud_Quality</i>	?	-0.142** (-2.291)	-0.002 (-0.211)
<i>BTD</i>	+	0.503** (2.279)	0.043 (1.509)
<i>Tax_Method</i>	-	-0.198** (-2.042)	-0.016 (-1.530)
<i>DAccrual</i>	?	0.189 (0.927)	0.001 (0.031)
<i>Opinion</i>	-	-0.082 (-1.281)	-0.008 (-0.728)
<i>Exe_Shares</i>	?	-1.281*** (-3.112)	-0.056 (-0.898)
<i>Ownership</i>	-	-0.024 (-0.593)	-0.011** (-1.997)
<i>Bshares</i>	?	0.097 (1.116)	0.004 (0.307)
<i>Overseas_Shares</i>	?	0.165 (0.790)	-0.004 (-0.132)
<i>Rights_Issue</i>	?	-0.033 (-1.102)	-0.006 (-1.310)
<i>ROE</i>	-	0.031 (0.274)	-0.010 (-0.521)
<i>Leverage</i>	?	-0.178** (-2.013)	-0.025 (-1.871)
<i>Age</i>	?	0.005 (0.414)	-0.003 (-1.721)
<i>Cosize</i>	-	-0.249*** (-8.310)	-0.033*** (-7.379)
<i>Political_Connection</i>	-	-0.024 (-0.568)	0.007 (0.847)
$\lambda_{audit_quality}$?	0.293 (1.132)	0.013 (0.307)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.74***	8.98***
<i>Aud_Quality +</i>	-	-0.146***	-0.016***
<i>DelinkxAud_Quality</i>		(-2.980)	(-2.680)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 11
Other Sensitivity Tests (Sample Period 1998-2003)

A “high-quality auditor” is both a non-local auditor (with a less than 50 percent client assets concentration) AND a large auditor (a Top-5 Chinese or a Big-5 firm)

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	0.634*** (15.125)	0.102*** (8.782)
<i>Aud_Quality</i>	-	-0.197*** (-3.895)	-0.030*** (-4.777)
<i>Delink</i>	+	0.070 (1.282)	0.000 (0.062)
<i>DelinkxAud_Quality</i>	?	-0.039 (-0.523)	0.010 (1.146)
<i>BTD</i>	+	0.675*** (2.937)	0.053** (2.062)
<i>Tax_Method</i>	-	-0.238** (-2.145)	-0.019 (-1.306)
<i>DAccrual</i>	?	0.087 (0.408)	-0.007 (-0.248)
<i>Opinion</i>	-	-0.060 (-0.958)	-0.006 (-0.620)
<i>Exe_Shares</i>	?	-0.878*** (-4.832)	-0.032 (-1.356)
<i>Ownership</i>	-	-0.048 (-1.242)	-0.013*** (-2.776)
<i>Bshares</i>	?	0.027 (0.369)	-0.002 (-0.214)
<i>Overseas_Shares</i>	?	0.014 (0.083)	-0.016 (-0.682)
<i>Rights_Issue</i>	?	-0.027 (-0.813)	-0.005 (-0.983)
<i>ROE</i>	-	-0.093 (-0.757)	-0.021 (-1.090)
<i>Leverage</i>	?	-0.210** (-2.298)	-0.027** (-2.005)
<i>Age</i>	?	-0.003 (-0.378)	-0.003** (-2.420)
<i>Cosize</i>	-	-0.231*** (-9.746)	-0.032*** (-7.897)
<i>Political_Connection</i>	-	0.012 (0.377)	0.009 (1.651)
$\lambda_{audit_quality}$?	-0.028 (-0.268)	-0.007 (-0.417)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.84***	9.29***
<i>Aud_Quality +</i>	-	-0.237***	-0.020***
<i>DelinkxAud_Quality</i>		(-4.930)	(-3.320)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 12

Other Sensitivity Tests (Sample Period 1998-2003)

A “high-quality auditor” is a non-local auditor (with a less than 50 percent client assets concentration) or a large auditor (a Top-10 Chinese or a Big-5 firm)

n=1,952	Expected Sign	(1): Tax_Adj Coeff/(t-statistic)	(2): BTC_Adj Coeff/(t-statistic)
<i>Constant</i>	?	2.872*** (8.363)	0.506*** (9.116)
<i>Aud_Quality</i>	-	-0.005 (-0.133)	-0.013 (-1.750)
<i>Delink</i>	+	0.083 (1.365)	0.007 (0.618)
<i>DelinkxAud_Quality</i>	?	-0.052 (-0.739)	-0.008 (-0.762)
<i>BTD</i>	+	0.560** (2.553)	0.044 (1.696)
<i>Tax_Method</i>	-	-0.153 (-1.552)	-0.012 (-1.179)
<i>DAccrual</i>	?	0.196 (0.964)	0.001 (0.045)
<i>Opinion</i>	-	-0.074 (-1.195)	-0.007 (-0.702)
<i>Exe_Shares</i>	?	-1.036*** (-5.166)	-0.042 (-1.694)
<i>Ownership</i>	-	-0.011 (-0.285)	-0.010** (-2.010)
<i>Bshares</i>	?	0.086 (1.382)	0.004 (0.374)
<i>Overseas_Shares</i>	?	0.069 (0.741)	-0.010 (-0.892)
<i>Rights_Issue</i>	?	-0.034 (-1.133)	-0.006 (-1.349)
<i>ROE</i>	-	-0.024 (-0.289)	-0.012 (-0.911)
<i>Leverage</i>	?	-0.220** (-2.533)	-0.028** (-2.114)
<i>Age</i>	?	0.023 (1.796)	-0.002 (-0.890)
<i>Cosize</i>	-	-0.225*** (-9.679)	-0.032*** (-8.002)
<i>Political_Connection</i>	-	-0.025 (-0.717)	0.006 (1.036)
$\lambda_{audit_quality}$?	0.310 (1.552)	0.013 (0.777)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.69***	8.98***
<i>Aud_Quality +</i>	-	-0.057***	-0.021***
<i>DelinkxAud_Quality</i>		(-0.950)	(-2.910)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 13
Other Sensitivity Tests (Sample Period 1998-2003)
A “high-quality auditor” is a non-local auditor
(with a less than a 50 percent client assets concentration)

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	3.353*** (9.991)	0.535*** (9.713)
<i>Aud_Quality</i>	-	-0.114*** (-3.326)	-0.021*** (-3.387)
<i>Delink</i>	+	0.046 (0.631)	-0.003 (-0.256)
<i>DelinkxAud_Quality</i>	?	-0.043 (-0.729)	0.002 (0.268)
<i>BTD</i>	+	0.696*** (2.979)	0.056** (2.177)
<i>Tax_Method</i>	-	-0.179 (-1.852)	-0.013 (-1.268)
<i>DAccrual</i>	?	0.048 (0.227)	-0.011 (-0.402)
<i>Opinion</i>	-	-0.062 (-0.993)	-0.007 (-0.697)
<i>Exe_Shares</i>	?	-0.854*** (-4.840)	-0.029 (-1.240)
<i>Ownership</i>	-	-0.055 (-1.362)	-0.013*** (-2.818)
<i>Bshares</i>	?	0.023 (0.413)	-0.001 (-0.076)
<i>Overseas_Shares</i>	?	-0.133 (-0.891)	-0.028 (-1.709)
<i>Rights_Issue</i>	?	-0.031 (-1.044)	-0.006 (-1.351)
<i>ROE</i>	-	-0.071 (-0.892)	-0.015 (-1.147)
<i>Leverage</i>	?	-0.193** (-2.198)	-0.025 (-1.958)
<i>Age</i>	?	0.000 (0.039)	-0.003 (-1.766)
<i>Cosize</i>	-	-0.222*** (-7.666)	-0.031*** (-7.554)
<i>Political_Connection</i>	-	0.019 (0.623)	0.010 (1.756)
$\lambda_{audit_quality}$?	-0.149 (-1.090)	-0.021 (-1.229)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.28***	8.98***
<i>Aud_Quality +</i>	-	-0.157***	-0.019***
<i>DelinkxAud_Quality</i>		(-3.430)	(-3.360)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 14
Other Sensitivity Tests (Sample Period 1998-2003)

A “high-quality auditor” is a large auditor (a Top-5 Chinese or a Big-5 firm)

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	2.355*** (4.335)	0.446*** (5.668)
<i>Aud_Quality</i>	-	0.043 (0.997)	-0.008 (-1.413)
<i>Delink</i>	+	0.078 (1.863)	0.001 (0.079)
<i>DelinkxAud_Quality</i>	?	-0.149** (-2.334)	-0.001 (-0.107)
<i>BTD</i>	+	0.628*** (2.786)	0.049 (1.873)
<i>Tax_Method</i>	-	-0.222** (-2.292)	-0.019 (-1.771)
<i>DAccrual</i>	?	0.110 (0.536)	-0.004 (-0.157)
<i>Opinion</i>	-	-0.068 (-1.091)	-0.007 (-0.720)
<i>Exe_Shares</i>	?	-1.014*** (-4.921)	-0.044 (-1.694)
<i>Ownership</i>	-	-0.038 (-1.004)	-0.012** (-2.470)
<i>Bshares</i>	?	0.079 (1.274)	0.005 (0.499)
<i>Overseas_Shares</i>	?	0.045 (0.468)	-0.008 (-0.715)
<i>Rights_Issue</i>	?	-0.046 (-1.457)	-0.008 (-1.602)
<i>ROE</i>	-	0.060 (0.576)	-0.004 (-0.266)
<i>Leverage</i>	?	-0.192** (-2.228)	-0.025 (-1.911)
<i>Age</i>	?	0.009 (0.807)	-0.002 (-1.255)
<i>Cosize</i>	-	-0.214*** (-9.204)	-0.030*** (-7.728)
<i>Political_Connection</i>	-	0.005 (0.158)	0.008 (1.370)
$\lambda_{audit_quality}$?	0.112 (1.851)	0.009 (1.047)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.71***	9.41***
<i>Aud_Quality +</i>	-	-0.106***	-0.009***
<i>DelinkxAud_Quality</i>		(-2.210)	(-1.720)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 15
Other Sensitivity Tests (Sample Period 1998-2003)

Tax Noncompliance is measured by the differential effective tax rate

n=1,952	Expected Sign	Diff_ETR Coeff/(t-statistic)
<i>Constant</i>	?	0.122 (0.978)
<i>Aud_Quality</i>	-	0.005 (0.655)
<i>Delink</i>	+	-0.037 (-1.455)
<i>DelinkxAud_Quality</i>	?	-0.061*** (-2.896)
<i>BTD</i>	+	0.251*** (5.094)
<i>Tax_Method</i>	-	-0.023 (-0.961)
<i>DAccrual</i>	?	-0.132** (-2.143)
<i>Opinion</i>	-	0.028 (0.421)
<i>Exe_Shares</i>	?	-0.392*** (-4.331)
<i>Ownership</i>	-	-0.008 (-0.716)
<i>Bshares</i>	?	-0.032** (-2.112)
<i>Overseas_Shares</i>	?	-0.124*** (-3.627)
<i>Rights_Issue</i>	?	0.006 (0.729)
<i>ROE</i>	-	-0.081*** (-4.585)
<i>Leverage</i>	?	0.036 (0.702)
<i>Age</i>	?	0.002 (0.652)
<i>Cosize</i>	-	-0.022 (1.747)
<i>Political_Connection</i>	-	0.062 (0.674)
$\lambda_{audit_quality}$?	0.234 (1.520)
<i>Industry dummies</i>	?	Included, but not reported for brevity
F value		9.527
<i>Aud_Quality +</i>	-	-0.056***
<i>DelinkxAud_Quality</i>		(-2.550)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 16
Other Sensitivity Tests (Sample Period 1998-2003)

Natural log of tax audit adjustments as a dependent variable

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	6.857*** (11.968)	7.906*** (9.656)
<i>Aud_Quality</i>	-	0.087 (1.222)	-0.171 (-1.904)
<i>Delink</i>	+	0.465*** (4.731)	0.245 (1.866)
<i>DelinkxAud_Quality</i>	?	-0.377*** (-3.554)	-0.049 (-0.349)
<i>BTD</i>	+	0.772*** (4.224)	0.878*** (3.841)
<i>Tax_Method</i>	-	-0.290 (-1.510)	0.302 (1.195)
<i>DAccrual</i>	?	0.301 (0.953)	-0.524 (-1.245)
<i>Opinion</i>	-	-0.093 (-1.091)	-0.159 (-1.338)
<i>Exe_Shares</i>	?	-1.846*** (-3.234)	0.413 (0.614)
<i>Ownership</i>	-	-0.116 (-1.222)	-0.166 (-1.411)
<i>Bshares</i>	?	-0.045 (-0.389)	-0.268 (-1.853)
<i>Overseas_Shares</i>	?	-0.411 (-1.529)	-0.873*** (-2.657)
<i>Rights_Issue</i>	?	-0.051 (-0.779)	-0.002 (-0.028)
<i>ROE</i>	-	-0.114 (-1.138)	-0.259 (-1.871)
<i>Leverage</i>	?	-0.671*** (-4.297)	-0.648*** (-3.170)
<i>Age</i>	?	-0.063*** (-3.656)	-0.102*** (-4.883)
<i>Cosize</i>	-	-0.614*** (-15.604)	-0.862*** (-18.307)
<i>Political_Connection</i>	-	0.003 (0.041)	0.058 (0.707)
$\lambda_{audit_quality}$?	-0.467 (-1.602)	-0.608 (-1.525)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		24.85***	24.68***
<i>Aud_Quality +</i>	-	-0.290***	-0.220***
<i>DelinkxAud_Quality</i>		(-3.680)	(-2.020)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *DelinkxAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

TABLE 17
Other Sensitivity Tests (Sample Period 1998-2003)
Book-tax conformity level is measured by the variable RMSE

n=1,952	Expected Sign	(1): <i>Tax_Adj</i> Coeff/(t-statistic)	(2): <i>BTC_Adj</i> Coeff/(t-statistic)
<i>Constant</i>	?	3.167*** (10.373)	0.519*** (9.021)
<i>Aud_Quality</i>	-	-0.034 (-1.178)	-0.017*** (-2.936)
<i>RMSE</i>	+	0.152** (2.103)	0.003 (0.286)
<i>RMSExAud_Quality</i>	?	-0.102 (-1.461)	0.001 (0.087)
<i>BTD</i>	+	0.393** (2.463)	0.043 (1.622)
<i>Tax_Method</i>	-	-0.187 (-1.950)	-0.014 (-1.351)
<i>DAccrual</i>	?	0.213 (1.326)	-0.001 (-0.048)
<i>Opinion</i>	-	-0.095 (-1.530)	-0.008 (-0.740)
<i>Exe_Shares</i>	?	-1.012*** (-4.028)	-0.054 (-1.535)
<i>Ownership</i>	-	-0.020 (-0.481)	-0.009 (-1.578)
<i>Bshares</i>	?	0.059 (0.890)	0.003 (0.323)
<i>Overseas_Shares</i>	?	0.059 (0.443)	-0.002 (-0.104)
<i>Rights_Issue</i>	?	-0.019 (-0.656)	-0.006 (-1.342)
<i>ROE</i>	-	-0.062 (-0.758)	-0.013 (-0.952)
<i>Leverage</i>	?	-0.205*** (-2.670)	-0.028** (-2.135)
<i>Age</i>	?	0.001 (0.092)	-0.002 (-1.444)
<i>Cosize</i>	-	-0.223*** (-10.209)	-0.032*** (-7.946)
<i>Political_Connection</i>	-	-0.043 (-1.256)	0.007 (1.051)
$\lambda_{audit_quality}$?	0.178 (0.998)	0.020 (0.675)
<i>Industry dummies</i>	?	Included, but not reported for brevity	
F value		9.47	8.68
<i>Aud_Quality + RMSExAud_Quality</i>	-	-0.136** (-2.230)	-0.016** (-2.090)

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively. The coefficient of the interaction term, *RMSExAud_Quality*, measures the sensitivity of the constraining effect of auditor quality on tax audit adjustment as book-tax conformity decreases. *Aud_Quality* equals 1 if the auditor is a high-quality auditor, and 0 otherwise. *RMSE* is coded as 1 if the value is higher than the sample mean, and 0 if lower than the sample mean. All other variables are defined in Appendix 1. Standard errors are clustered by both firm and year (Gow et al. 2010).

APPENDIX 1
Definition of Variables

<i>Tax_Adj</i>	= total tax audit adjustments required by the Chinese tax authorities for tax noncompliance detected, deflated by sales revenue.
<i>BTC_Adj</i>	= book-tax-conforming tax audit adjustments deflated by sales revenue.
<i>Diff_ETR</i>	= difference between the statutory tax rate (STR) and the effective tax rate (ETR).
<i>Aud_Quality</i>	= 1 if the auditor is a non-local or a large auditor (a Top-5 Chinese audit firm or a Big-5 firm).
<i>Delink</i>	= 1 if the sample year is from 2001 to 2003 (i.e., the lower book-tax conformity period), 0 if the sample year is from 1998 to 2000 (i.e., the higher book-tax conformity period).
<i>BTD</i>	= pretax book income minus taxable income deflated by sales revenue.
<i>Tax_Method</i>	= 1 if a company adopts the tax payable method for financial reporting purposes, 0 if a company adopts the tax effect method.
<i>DAccrual</i>	= discretionary accruals of a company based on the modified Jones (1991) model.
<i>Opinion</i>	= 1 if a company receives an unqualified audit opinion in the year, 0 otherwise.
<i>Ex_Opinion</i>	= 1 if a company receives an unqualified audit opinion in the previous year, 0 otherwise.
<i>Market_Index</i>	= index reflecting the development of market intermediaries and legal environment in different provinces of China based on Fan and Wang (1998-2006). A higher index suggests a more developed market.
<i>Indirratio</i>	= number of independent directors over the total number of directors on the board.
<i>Exe_Shares</i>	= number of shares held by senior executives divided by total number of shares of the company at the end of the year.
<i>Ownership</i>	= 1 if a company is non-local government-owned, 0 otherwise
<i>Bshares</i>	= 1 if a company has foreign shareholders, 0 otherwise.
<i>Overseas_Shares</i>	= 1 if a company has shares listed in an overseas stock exchange, 0 otherwise.
<i>Rights_Issue</i>	= 1 if a company raises additional capital in the succeeding year, 0 otherwise.
<i>ROE</i>	= the ratio of net income before tax to equity.
<i>Leverage</i>	= total debts divided by total assets at the end of the year.
<i>Current_Ratio</i>	= the ratio of current assets to current liabilities.
<i>Age</i>	= number of years of operation since the initial public offering of the firm.
<i>Cosize</i>	= the natural logarithm of a company's year-end total assets.
<i>Political_Connection</i>	= 1 if both the Chief Executive Officer and the General Manager of a firm have political appointments in China, 0 otherwise.

APPENDIX 2 Pearson Correlation Matrix for the Independent Variables Used in the Main Regression

Coeff/p-value	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<i>(1) Aud_Quality</i>	1															
<i>(2) BTD</i>	-.070 .002	1														
<i>(3) Delink</i>	.128 .000	.049 .031	1													
<i>(4) Tax_Method</i>	-.022 .342	.004 .854	-.011 .621	1												
<i>(5) DAccrual</i>	.030 .183	-.003 .901	-.011 .638	.049 .031	1											
<i>(6) Opinion</i>	.028 .224	-.111 .000	.084 .000	-.021 .344	.031 .171	1										
<i>(7) Exe_Shares</i>	-.064 .005	.000 .988	-.069 .002	.041 .067	.015 .519	-.022 .337	1									
<i>(8) Ownership</i>	.069 .002	-.045 .049	-.046 .044	-.067 .003	-.014 .550	.025 .276	-.051 .025	1								
<i>(9) Bshares</i>	.063 .005	-.005 .823	.002 .917	-.064 .005	-.087 .000	-.005 .815	-.013 .558	-.015 .504	1							
<i>(10) Overseas_Shares</i>	.121 .000	.000 .992	.022 .329	-.174 .000	-.052 .021	-.028 .210	-.053 .018	.169 .000	-.047 .037	1						
<i>(11) Rights_Issue</i>	-.019 .404	-.031 .167	-.073 .001	.002 .938	.066 .003	.055 .015	.041 .068	.010 .657	-.029 .193	-.040 .074	1					
<i>(12) ROE</i>	.014 .539	-.046 .044	-.100 .000	-.019 .399	.108 .000	.150 .000	-.014 .530	.015 .498	-.008 .729	-.036 .109	.087 .000	1				
<i>(13) Leverage</i>	.033 .151	.059 .009	.110 .000	.023 .317	-.008 .732	-.184 .000	.025 .272	.027 .231	-.009 .705	.025 .269	-.030 .189	-.152 .000	1			
<i>(14) Age</i>	.141 .000	.094 .000	.580 .000	-.046 .042	-.042 .061	.010 .658	-.089 .000	.005 .824	.219 .000	.008 .731	-.080 .000	-.085 .000	.212 .000	1		
<i>(15) Cosize</i>	.053 .020	-.151 .000	.184 .000	-.184 .000	.005 .834	.060 .008	-.046 .043	.089 .000	.186 .000	.215 .000	.030 .180	.026 .247	.176 .000	.191 .000	1	
<i>(16) Political_Connection</i>	-.071 .002	.021 .356	.046 .040	.031 .177	-.046 .042	-.002 .943	.002 .930	-.043 .057	-.054 .018	-.036 .113	-.009 .694	.007 .742	.003 .907	-.023 .317	.023 .319	1

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Essay 2: The Effects of Book-Tax Delinking, Tax Rates and Tax Enforcement on Corporate Tax Noncompliance

2.1 INTRODUCTION

To bring domestic accounting regulations into harmony with international practices, China has gradually relaxed the traditional link between financial and tax reporting. This process began in 1998, with further book-tax delinking in 2001. Book-tax delinking provides more opportunities for management to practice both upward earnings management and aggressive tax noncompliance (i.e. downward taxable income) at the same time. In 2007, China took another step away from its traditional tax-based accounting system by formally adopting the International Financial Reporting Standards (IFRS). This move significantly reduced book-tax conformity.

Chan, Lin, and Mo (2010) use a proprietary database covering the 1996-2003 period to examine how the magnitudes of tax audit adjustments (which measure tax noncompliance) change as book-tax conformity decreases.¹ Their study provides evidence that tax noncompliance increases as the book-tax conformity decreases. Thus, according to book-tax trade off-theory, the significant reduction in book-tax conformity in the post-2007 period should provide Chinese firms with even more flexibility to increase tax noncompliance, due to lower non-tax costs.

Aggressive tax reporting practices can be costly to society. Policy makers have therefore developed various ways to reduce tax noncompliance, including cuts in tax rates (providing a side-effect on tax compliance) and more stringent tax enforcement measures. This essay aims to fill a research gap on this topic by providing evidence

¹ Chinese tax authorities consider both tax avoidance and tax evasion as noncompliance. All noncompliance is subject to penalty, and the tax authorities do not normally differentiate between avoidance and evasion. Although tax evaders can be prosecuted and jailed, the government typically levies monetary penalties.

on the comparative effects of various tax policies. To do this, I build on research by Chan et al. (2010) to investigate the tax noncompliance behavior of Chinese listed firms after they formally adopt IFRS, taking into account the effects of lower tax rates and stricter tax enforcement measures during a sample period from 2001 to 2012 (which includes pre- and post-IFRS years). Previous studies have investigated how the factors of book-tax delinking, lower tax rates and tax enforcement each have an effect on tax noncompliance. However, to my knowledge, no study has assessed the effects of (i) the interaction between book-tax delinking and tax rate change on tax noncompliance, or of (ii) the interaction between book-tax delinking and stringent tax enforcement on tax noncompliance. Thus, this essay contributes to the literature by examining the comparative effects of these factors on tax noncompliance.

Previous literature has focused on the benefits of adopting IFRS, such as increased financial statement comparability and capital market effects. Only a limited number of studies have examined the effect of IFRS adoption on tax reporting behavior. De Simone (2013) investigates whether the adoption of IFRS by the individual affiliates of multinational companies (for their unconsolidated financial reporting) facilitates tax-motivated profit shifting. Chan et al. (2010) examine tax noncompliance behavior in China from 1996 to 2003, as the nation moved from tax-based accounting toward IFRS. However, China had not yet comprehensively adopted the IFRS during this sample period, and there was no statutory reduction in corporate tax rates during that time.

Recent studies have examined the effect of China's recent tax rate reduction on earnings management (Lin, Lu, and Zhang 2012; Lin, Mills, and Zhang 2013). Chan, Leng, and Liang (2014) analyze the effect of sales tax rate reductions on the profits of automobile companies in China. They also provide a simulation (but not an empirical

test) of this effect. Many studies in various settings provide empirical evidence that tax rates are negatively associated with tax compliance (Feinstein 1991; Christian and Gupta 1993; Freire-Serén and Panadés 2013; Mas'ud, Aliyu, and Gambo 2014). Although reducing tax noncompliance is not the main purpose of tax rate cuts, noncompliance should be reduced due to the lower incentives for avoiding tax. China's corporate tax rate was reduced from 33 percent to 25 percent starting January 1, 2008. This lower rate should reduce tax noncompliance correspondingly. However, the extent to which lower tax rates moderate the increased tax noncompliance that arises from a decrease in book-tax conformity has not been explored.

Policy makers in both developed and developing countries have made combating tax noncompliance one of the main aims of their tax policies. The authorities have therefore moved to strengthen tax enforcement as a means to improve tax compliance. With stronger tax enforcement, taxpayers should show increased compliance due to the additional surcharges and penalties. However, little empirical research has been done on the actual effects of tax enforcement on corporate tax avoidance. Thus far, no study has examined whether or to what extent stronger tax enforcement measures overcome the increased noncompliance that arises from a decrease in book-tax conformity. The government has an interest in the effects of its tax enforcement efforts, especially in a book-tax disconformity period. The results of my research should therefore be useful to regulators and policy makers in many countries, including those that have not yet decided to move toward IFRS.

Based on empirical data from Chinese listed firms during the 2001-2012 period, I find that a lower tax rate significantly reduces the negative effect that a decrease in book-tax conformity has on tax noncompliance. The use of stricter tax enforcement measures also attenuates the effect of a decrease in book-tax conformity on tax

noncompliance. The regression results also suggest that use of a lower tax rate is more effective than the use of a stronger tax enforcement for attenuating the effect that delinking has on tax noncompliance. Upon taking into account *both* the effect of a lower tax rate and a more stringent tax enforcement measures together, the resulting impact is then able to *more than* offset the negative delinking effect on tax noncompliance.

I also find that both the tax rate effect and the tax enforcement effect are able to constrain tax noncompliance in both the high- and the low- conformity periods. Moreover, the effects of these two measures increase significantly from the high- to the low-conformity period (i.e., both effects are more pronounced when the conformity is lower). These research findings are robust to various sensitivity tests.

In the past decade, the adoption of IFRS and lower tax rates have both occurred at about the same time in many countries, such as China, Japan, Vietnam, Indonesia and the European Union countries.² Deloitte (2008) reports that the overall tax results under IFRS are not as favorable as those under local Generally Accepted Accounting Principles (GAAP). For example, many instruments that currently qualify as equity under local GAAP may be re-characterized as debt after applying IFRS. This change in accounting standards may also trigger the interest expense limitation rules for tax reporting purposes, thus increasing the tax burden on firms.³ In this situation, A tax rate reduction policy to apply lower tax rates on firms may then be effective in offsetting the increased tax burden on companies and in maintaining tax

² For example, in June 2014, the Japanese government announced its intention to reduce the corporate tax rate from 36 percent to 25 percent as country pursued the adoption of IFRS (SCMP 2014).

³ Another example is change in the classification of hybrid instruments, such as those in which a firm that receives “interest” is treated as receiving a dividend, but the interest-paying firm gets an interest deduction. For such instruments, a change in the definition of equity under the IFRS may unexpectedly eliminate the tax benefits of hybrid instruments, as the income may be treated as interest income (taxable) rather than a dividend (tax exempt). Such changes can increase the tax burden on recipient firms.

competitiveness. It is therefore useful for researchers and policy makers to understand how these factors interact to influence tax noncompliance. My research results can provide a useful reference for countries that are contemplating a lower corporate tax rate to increase their tax competitiveness, and are at the same time moving toward the use of IFRS-equivalent accounting standards to meet the challenge of business globalization. China is not alone in attempting to move away from a tax-based accounting system while lowering tax rates. Therefore, my research results may prove informative to international accounting standard setters and tax regulators around the world, who face the need to improve financial reporting while increasing tax competitiveness.

The remainder of the paper proceeds as follows. Section 2.2 describes China's 2008 tax reform and its changes in accounting standards toward the adoption of IFRS during 2007. Section 2.3 reviews the relevant literature and develops the research hypotheses. Section 2.4 presents the research method. Section 2.5 discusses the empirical results, and section 2.6 presents the conclusions.

2.2 INSTITUTIONAL BACKGROUND

2.2.1 China's 2008 Tax Reform

To attract foreign investment, China moved in 1991 to enact different income tax policies for foreign investment enterprises and domestic enterprises. Domestic enterprises were generally taxed at a flat rate of 33 percent (including 3 percent local tax), and foreign investment enterprises often enjoyed a preferential tax rate of 15 percent (with local tax waived). As China's economy grew, efforts were made to unify the corporate income tax system, such that all enterprises would be taxed at the same rate. On March 16, 2007, the National People's Congress promulgated a New

Enterprise Income Tax Law (NEIT) to take effect on January 1, 2008. This law unified the corporate tax rate for all enterprises at a flat rate of 25 percent (with no local tax imposed). Thus, for domestic enterprises, the corporate tax rate was reduced from 33 percent to 25 percent. There were several reasons for this reduction in tax rate. The new tax policy sought to (1) enhance economic development, (2) meet the challenge of business globalization, (3) equalize taxation among domestic and foreign enterprises and (4) create an internationally competitive and efficient tax system.

Companies that were established before the promulgation of the NEIT and had enjoyed preferential tax treatment in the form of reduced enterprise income tax rates were allowed a gradual transition to the standard tax rate over a five-year period, beginning from 2008. More specifically, enterprises that operated in the Special Economic Zones or the Shanghai Pudong New Area, which were originally subject to a tax rate of 15 percent, were granted a favorable corporate income tax rate of 18 percent for 2008, 20 percent for 2009, 22 percent for 2010, 24 percent for 2011 and 25 percent for 2012. Enterprises that previously enjoyed a “two-year exemption followed by a three-year half-rate reduction” or a “five-year exemption followed by a five-year half-rate reduction” could continue to enjoy such treatment until the end of their preferential treatment periods.

2.2.2 Change in Accounting Standards to Converge with IFRS

Starting from the late 1990s, China gradually recognized the need to move away from its tax-based accounting system. Effective from 2001, the country adopted the revised Accounting Standards for Business Enterprises, which marked a departure from a tax-based accounting system toward the application of IFRS (Chan et al. 2010). The internationalization of Chinese accounting has been driven by rapid progress in

economic restructuring toward a market-oriented economy and by the government's intention to attract more foreign capital. In particular, following China's official entry into the World Trade Organization (WTO) in late 2001, the Chinese economy has become increasingly integrated with the world market. This development calls for the harmonization of Chinese accounting standards and practices with internationally accepted norms, because accounting serves as the language of business.

The year 2007 was another turning point in Chinese accounting regulations. In February 2006, the Ministry of Finance in China promulgated a new set of IFRS-equivalent Accounting Standards for Business Enterprises, which took effect from January 1, 2007. This reform served to accommodate the growing demand for investor-oriented financial information. The new rules outlined basic standards and a new conceptual framework for accounting principles, which included 38 sets of specific standards with application guidelines for practice.

In addition to achieving the convergence of Chinese accounting standards with the IFRS, the new standards signaled another major departure of financial reporting from tax-based reporting, which further reduced book-tax conformity. The new accounting and tax regulations have allowed a widening gap between financial and tax reporting in the post-2007 period. Examples of this gap include the use of the fair value model for investment properties and the use of the tax effect method to account for income tax, as elaborated below.

One of the most significant changes under the new accounting standards is the introduction of the fair value model in areas such as investment properties and financial instruments. Under the fair value model, there is no need for depreciation or amortization of an investment property. Therefore, a gain or loss arising from a change in fair value of the property should be recognized as income during the period

in which it arises. However, for tax purposes, investment property continues to be accounted for using the historical costs principle (i.e., the costs of construction or the purchase price, plus related expenses). Any unrealized gains or losses for investment properties are not recognized for tax reporting purposes. Therefore, this change in reporting standards enables firms to inflate book income without a corresponding increase in taxable income. Firms may also manipulate the cost basis of their property to reduce taxes without a corresponding effect on financial reporting. Such delinking of tax and financial reporting guidelines can encourage noncompliance.

Another significant factor in the book-tax gap is that before 2007, most Chinese companies were allowed to use the tax payable method to account for income taxes for financial reporting purposes. Under the new Accounting Standards of 2007, firms are only allowed to use the tax effect method to account for income taxes. When using the tax payable method, a company recognizes its income tax expense based on the taxable income for the current period, without taking the effect of timing differences into account. In other words, the income tax expenses reported in financial statements will be the same as the income tax payable reported to the tax authorities for the current period. Thus, book reporting and tax reporting conform with respect to the income tax amount. In contrast, the tax effect method requires firms to recognize the effect of timing differences on income tax in the relevant period. Accordingly, the income tax expenses reported in the financial statements and the tax liabilities reported to the tax authorities can be quite different. This book-tax difference concerning income tax expenses provides more opportunities for firms to manage both book income and taxable income to their advantage.

2.2.3 Business Globalization

In the absence of a global standard, each country sets its own local GAAP for companies that are required to publicly report their financial results. As these standards differ by country, it is difficult to compare companies that report in different jurisdictions. To meet the recent challenges of business globalization and accession to the WTO, many countries have been adopting or moving toward the use of IFRS-equivalent accounting standards, and at the same time contemplating corporate tax rate reductions to increase their tax competitiveness. Regulators expect that the use of IFRS enhances the comparability and quality of financial statements, and hence benefits investors (Barth, Landsman, and Lang 2008; Yip and Young 2012; Brochet, Jagolinzer, and Riedl 2013). Starting from January 2005, the listed companies of all European Union countries were required to prepare consolidated financial statements using IFRS (Hung and Subramanyam 2007; Christensen, Hail, and Leuz 2013; PwC 2013). In addition to China, other transition economies such as Russia and Vietnam have also departed from tax-based accounting toward the adoption of IFRS in recent years (Goncharov and Zimmermann 2006; Phuong and Richard 2011).

Corporate tax rate reduction has also emerged as an important strategic policy in many jurisdictions, as a means to maintain tax competitiveness. Foreign direct investments (FDI) and decisions regarding new plants are affected by the corporate tax burden. De Mooij and Ederveen (2003) compare the outcomes of 25 empirical studies by computing the effects of tax rate elasticity on FDI. They find that a 1 percent reduction in the host-country's tax rate raises FDI in that country by 3.3 percent. Devereux, Lockwood, and Redoano (2008) find that the fall in statutory tax rates in the OECD countries during the 1980s and 1990s can be explained by competition

between these countries' over corporate taxes for mobile profits. Desai, Foley, and Hines Jr. (2004) also find that high income tax rates are associated with low levels of FDI.

I observe that the adoption of IFRS and reductions in corporate tax rates often occur either concurrently or consecutively in many countries, especially in economies that are heavily dependent on international business and investment. Typical examples include the European Union countries and Japan.⁴ Along with their joint adoption of IFRS in 2005, some 25 out of the 27 European Union countries reduced their corporate income tax rates during the period from 2001 to 2012, with an average decrease of 27 percent (as indicated in Table 1). Among developing countries, I find that tax rate reductions and adoptions of IFRS have occurred at close to the same times in nations such as Vietnam and Indonesia.⁵ Deloitte (2008) finds that the overall tax results under IFRS are not as favorable as those under local GAAP. Therefore, a tax policy of adopting lower tax rates can be used to mitigate tax consequences.

[Insert Table 1 about here]

2.3 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

⁴ Qualifying companies in Japan have been permitted to adopt IFRS for preparing their consolidated financial statements on a voluntary basis since March 2010. To encourage further application of IFRS in October 2013, the Financial Services Agency (FSA) of Japan eliminated certain eligibility requirements for companies to use IFRS. At the same time, Japan decreased its corporate income tax rate from 40.69 percent in 2010 to 38.01 percent in 2012, and to 35.64 percent in 2014.

⁵ During the 2001 to 2005 period, the Ministry of Finance of Vietnam gradually adopted IFRS by implementing a total of 26 IFRS-equivalent Vietnam Accounting Standards in five batches. The corporate tax rate in Vietnam was also reduced from 35 percent in 1999 to 32.5 percent in 2000, 32 percent in 2001 and 28 percent in 2004. On December 23, 2008, the Indonesian Institute of Accounts (IAI) announced its plan to harmonize the Indonesian Statement of Accounting Standards with IFRS starting from 2009. As of December 1, 2012, the IAI had published 40 standards, 20 interpretations and 11 revocations. Along with this accounting standard harmonization process, Indonesia's corporate tax rate was decreased from the highest maximum progressive rate of 30 percent in 2008 to a flat rate of 28 percent in 2009, and then to 25 percent in 2010.

2.3.1 Book-Tax Delinking and Lower Tax Rates

In a tax-based accounting system, if firms understate their taxable incomes, they generally have to report lower book income. Likewise, if they overstate book income, they have to pay higher taxes. In other words, when the two measures of income conform to each other, there is less flexibility for opportunistic reporting behavior. The formal adoption of IFRS in 2007 has further reduced book-tax conformity in China. This book-tax delinking provides more opportunities for management to practice both upward earnings management and aggressive tax noncompliance (downward reporting of taxable income). In a lower book-tax conformity period, management has greater incentives to engage in tax noncompliance due to lower non-tax costs, according to book-tax trade-off theory (Mills and Newberry 2001). Badertscher, Phillips, Pincus, and Rego (2009) and Frank, Lynch, and Rego (2009) also suggest that when tax reporting and financial reporting need not conform with each other, firms are able to manipulate the income measures for both sets of reporting requirements to achieve their optimal reporting outcomes. Furthermore, Chan et al. (2010) find that tax noncompliance increases as book-tax conformity decreases in China. De Simone (2013) investigates whether the adoption of IFRS by individual affiliates of multinational entities in European Union countries for unconsolidated financial reporting facilitates tax-motivated profit shifting. She finds a 17.5 percent tax-motivated change in reported pre-tax profits following the affiliates' adoption of IFRS, as compared to no change in income shifting behavior among non-adopters.

Previous studies find evidence to support the contention that a higher tax rate is negatively related to tax compliance (Allingham and Sandmo 1972; Feinstein 1991; Christian and Gupta 1993; Freire-Serén and Panadés 2013; Mas'ud et al. 2014).

Chan and Mo (2000) examine the tax noncompliance behavior of firms in various tax holiday periods. They find that anticipated tax rate changes affect tax noncompliance and that firms are more tax compliant in the tax-exemption periods. Lin et al. (2013) find that before the tax rate decrease in 2008, both private and public firms in China had a tax-motivated incentive to manage earnings downward. Management's incentive to avoid taxes should have been higher prior to 2008, due to the higher tax rates. Scholes, Wilson, and Wolfson (1992) suggest that tax avoidance involves non-tax costs, including administrative and implementation expenses. For example, substantial planning and coordination is required to shift taxable income across periods to reduce the tax burden. Firms subject to a lower tax rate should have lesser needs or incentives to understate taxable income in order to avoid additional costs.

In general, a lower tax rate should encourage more tax compliance, but it may also lower the cost for noncompliance, because the additional taxes and penalties are lower if noncompliance is detected by the tax authorities. Thus, whether the imposition of a lower tax rate indeed encourages tax compliance is an empirical question to be further investigated.

To summarize, previous studies provide evidence that tax noncompliance increases when book-tax conformity decreases, whereas a lower tax rate provides a direct and positive initiative to encourage tax compliance. I expect that the use of a lower tax rate can moderate the extent of the tax noncompliance associated with lower book-tax conformity. However, it is an open question whether the use of a lower tax rate completely overrides the negative effect of lower book-tax conformity on tax noncompliance. Thus, I formulate the first hypothesis as follows:

H1: *Ceteris paribus*, adoption of a lower corporate tax rate attenuates the negative effect of reduced book-tax conformity on tax noncompliance.

2.3.2 Book-Tax Delinking and Stringent Tax Enforcement

Empirical research on the effect of tax enforcement on corporate tax avoidance is limited thus far. Allingham and Sandmo (1972) find that an increase in the probability of detection leads to larger amounts of taxable income being declared. Firms need to consider the costs stemming from aggressive tax avoidance strategies, including the fines, interest and penalties that the tax authorities can impose for noncompliance (Wilson 2009). Firms can also be subject to negative publicity and high litigation costs if their tax noncompliance is detected (Hanlon and Slemrod 2009). Therefore, stricter tax enforcement can constrain tax noncompliance. Desai et al. (2007) show that Russian firms increased their tax payments and abandoned tax havens following an increase in tax enforcement after the 2000 election of Vladimir Putin. Hoopes, Mescall, and Pittman (2012) find that stronger tax enforcement reduces the incentives to understate taxable income. These authors also find that closer IRS monitoring tends to limit corporate tax avoidance, and this limiting effect is particularly strong when a firm's corporate governance is weak. These two studies provide empirical evidence that tax enforcement has a deterrent effect on tax avoidance. Atwood, Drake, and Myers (2012) investigate a sample of firms across 22 countries and find that firms generally practice less tax avoidance when the level of book-tax conformity is high and when enforcement is perceived to be strong. Gupta and Lynch (2012) find that expenditure on state corporate tax enforcement is positively associated with state corporate tax collection, which further suggests that stringent enforcement reduces tax noncompliance. However, the above-mentioned studies do not examine the effectiveness of tax enforcement in offsetting the effect of a reduction in book-tax conformity on tax noncompliance. My essay supplements the findings of these previous studies by examining whether the tax enforcement deterrent effect attenuates

the negative effect that reduced book-tax conformity has on tax noncompliance.

Slemrod (2004) suggests that due to the separation of ownership and control, the deterrence models of tax avoidance may not apply, because firm managers may be risk-averse, and shareholders with diversified portfolios may be more risk neutral. Therefore, shareholders may still want managers to pursue aggressive tax reporting to enhance firm value, even under stricter tax enforcement measures. Notwithstanding that stronger tax enforcement is generally expected to help in reducing a firm's incentives for noncompliance, firms understandably remain eager to invest in aggressive tax planning to reduce their taxable income, as their after-tax earnings benefit shareholders directly (Mills, Erickson, and Maydew 1998).

Furthermore, for tax enforcement measures to effectively deter tax noncompliance, they must be known and understood. Taxpayers must perceive that other offenders are being sanctioned if the enforcement measures are to prove effective (Morris 2010). Sanders, Reckers, and Iyer (2008) suggest that countries should increase tax enforcement efforts, including education on taxpayer accountability, in anticipation of an increased tax noncompliance. Thus, the effectiveness of China's tax enforcement measures may not be obvious, as the effect varies according to a firm's level of awareness of the mandatory and discretionary penalties for noncompliance (e.g. conduct high-profile prosecutions, highlight penalty structures, publicize tax audit rates).

Thus, I expect the effect of tax enforcement is able to reduce, but not completely offset the increase in tax noncompliance associated with book-tax disconformity. It remains an open empirical question as to how the relative interaction between a reduction in book-tax conformity and more stringent tax enforcement affects tax noncompliance. This consideration leads me to formulate the second hypothesis as

follows:

H2: Ceteris paribus, the adoption of stricter tax enforcement attenuates the negative effect that reduced book-tax conformity has on tax noncompliance.

2.4 RESEARCH METHOD

2.4.1 Sample Selection

I draw my sample from Chinese listed firms on the Shanghai and Shenzhen Stock Exchanges from 2001 to 2012. I collect financial statement data and other characteristics of the sample companies from the China Infobank database, the China Stock Market and Accounting Research database and the annual reports of the respective Chinese listed firms. I hand collect information regarding the political appointments of the CEOs and General Managers of the sample firms from their annual reports. I also hand collect the details on tax enforcement from data given in the *China Tax Audits Yearbook*.⁶

I begin with 18,795 firm-year observations, which include all of the listed A share firms on the Shanghai and Shenzhen Stock Exchanges from 2001 to 2012. I exclude 946 firm years for the companies that issued B shares (shares sold only to foreign investors).⁷ I exclude an additional 686 firm years with missing corporate information, such as details on ownership, executive shares, independent director

⁶ The *China Tax Audits Yearbook* is published annually by the State Administration of Taxation, and contains detailed information on tax collection efforts, such as the number of tax inspectors, the number of tax audits conducted, the amounts of regional tax revenue and the amounts of surcharges or penalties imposed.

⁷ Chinese listed firms issue “A” shares to domestic investors, and some of these firms also issue “B” shares to foreign investors. From 2001 to 2006, firms that exclusively issued A shares were required to prepare financial reports in accordance with domestic accounting standards. In contrast, A share firms that simultaneously issued B shares were required to provide financial reports in compliance with IFRS. Thus, firms that issued both kinds of shares experienced no change in the book-tax conformity level from 2001 to 2012.

ratios or political control. My final sample therefore consists of 17,163 firm year observations for the primary regression (Table 5).

2.4.2 Specification of the Regression Model

To examine the comparative effects on tax noncompliance after the formal adoption of IFRS-equivalent accounting standards (taking into account the effects of both lower tax rates and more stringent tax enforcement), I develop the following regression model, in which time and firm subscripts are suppressed for simplicity:

$$\begin{aligned}
 \text{Tax Noncompliance (Diff_ETR: Differential Effective Tax Rate)} = & \\
 & \alpha_0 + \alpha_1 \text{RMSE} + \alpha_2 \text{Low_Rate} + \alpha_3 \text{Tax_Enforcement} + \alpha_4 \text{RMSE} \times \text{Low_Rate} \\
 & + \alpha_5 \text{RMSE} \times \text{Tax_Enforcement} + \alpha_6 \text{DAccrual} + \alpha_7 \text{Opinion} + \alpha_8 \text{Ind_Dir} \\
 & + \alpha_9 \text{Dual_Role} + \alpha_{10} \text{Ownership} + \alpha_{11} \text{Exe_Shares} + \alpha_{12} \text{Overseas_Shares} \\
 & + \alpha_{13} \text{Rights_Issue} + \alpha_{14} \text{ROE} + \alpha_{15} \text{Leverage} + \alpha_{16} \text{Age} + \alpha_{17} \text{Cosize} \\
 & + \alpha_{18} \text{Political} + \alpha_{19} \text{Market_Index} + \alpha_{20} \text{Industry_dummies} \\
 & + \alpha_{21} \text{Year_dummies} + \varepsilon
 \end{aligned} \tag{1}$$

2.4.2.1 Measures of Tax Noncompliance and Explanatory Variables

Tax Noncompliance

I define tax noncompliance broadly as any activity, legal or otherwise, that reduces a firm's tax liability per dollar of pre-tax earnings. I use the effective tax rate (*ETR*), which is commonly accepted in the taxation literature as a proxy for the extent of tax noncompliance (Kerr 2013). Given the variations in applicable statutory tax rates within China due to various preferential tax policies, a firm may have a low *ETR* due to receiving a preferential tax rate. To ensure that a low *ETR* is not due to a low statutory tax rate (*STR*), I use the differential effective tax rate ($\text{Diff_ETR} = \text{STR} - \text{ETR}$) as the dependent variable in my analysis. *STR* is the statutory tax rate applicable to a given firm in a given year. Data for the *STR* are extracted from the firms' annual reports. I follow Hanlon and Heitzman (2010) to calculate *ETR* as "income tax

expense / profit before tax.” A large *Diff_ETR* suggests aggressive tax reporting, which is an indication of greater tax noncompliance.

Reduction in Book-Tax Conformity Level

I follow Atwood, Drake, and Myers (2010) in measuring the level of book-tax conformity by calculating the root mean squared error (*RMSE*) from a regression of current tax expense on pretax book income and dividends declared. *RMSE* represents the different book-tax conformity levels for each year from 2001 to 2012. A high *RMSE* indicates a lower level of book-tax conformity in a given year. The *RMSE* takes a value from 0 to 1, which represents a range between a completely high and a completely low conformity level. Chan et al. (2010) find that the lower the book-tax conformity, the higher the tax noncompliance. I expect the coefficient α_1 for the *RMSE* variable to be positive in my regression model.

Tax Rate Effect

A corporate tax rate reduction from 33 to 25 percent took effect in China on January 1, 2008. As mentioned earlier, some Chinese firms located in special economic zones continued to enjoy preferential reduced tax rates after this 2008 tax reform. These firms were normally entitled to a 15 percent preferential tax rate before 2008. The tax rates for these firms increased gradually from 15 percent before 2008 to 25 percent in 2012. To capture the effect of this adoption of a lower tax rate in attenuating the delinking effect on tax noncompliance, I code the variable *Low_Rate* as 1 to capture sample firms subject to a statutory corporate tax rate of 25 percent or lower (i.e., including those firms that are subject to preferential transitional arrangement).⁸ *Low_Rate* is coded as 0 for firm years subject to a corporate tax rate higher than 25

⁸ I re-run the regression model by excluding those firms that are subject to a preferential transitional arrangement, and the regression results (reported in Table 8) are comparable to those of the main test (reported in Table 5).

percent. The adoption of a lower tax rate should be associated with a lesser tax noncompliance, and I expect the coefficient α_2 to be negative.

Tax Enforcement Effect

Firms should be more tax compliant when tax enforcement measures are stricter. I therefore include the variable *Tax_Enforcement*, which is coded as 1 for higher tax enforcement, to examine the deterrent effect of enforcement on tax noncompliance.

The coefficient α_3 for this variable is expected to be negative.

The variable *Tax_Enforcement* represents a set of direct estimates for regional tax collection efforts in a given year, based on manually collected data from the *China Tax Audits Yearbook*.⁹ I use factor analysis (i.e., principal component analysis) to generate three metrics to capture the degree of tax enforcement effort for each sample year and province from 2001 to 2012. These three metrics are *Tax_Audit*, *Qualification* and *Audit_Results*. *Tax_Audit* is measured by several ratios, including the number of tax audits conducted over the number of tax returns filed in each province, the number of cases prosecuted over the number of tax returns filed, the number of permanent employees over the number of taxpayers and the number of tax inspectors over the number of taxpayers. *Qualification* is the percentage of inspectors with a bachelor's degree or higher. *Audit_Results* represents the ratio of the dollar amount of tax deficiencies settled and the dollar amount of surcharges, penalties, and fines, respectively, over the amount of regional tax revenue; and the dollar amount of surcharges, penalties, and fines over the number of tax audits conducted.

The results shown in Table 2 indicate that three factors explain 64.4 percent of the total variance in the original data. To maximize the variance of the squared

⁹ Some recent studies use the likelihood of an IRS audit as a proxy for tax authority enforcement (Guedhami and Pittman 2008; Hanlon, Hoopes, and Shroff 2014). However, this single proxy may have an inherent problem of reliance on variation in firm size. Thus, my study uses multiple measures to capture the tax enforcement effort, and most of these measures are far less reliant on variation in firm size. Nevertheless, I do use tax audit probability as a proxy in a robustness test.

loadings for each of these three retained factors on all of the eight variables/ratios in the corresponding factor matrix, I rotate the three factors orthogonally. Then I determine whether there is a statistical and substantive association between each factor and the other variables. The final results show that Factor 1 (*Tax_Audit*) is associated with ratios 1, 3 and 4, which are all related to the propensity for tax authorities to conduct and enforce tax audits in a given region. Factor 2 (*Qualification*) is associated with ratio 5, which represents the tax inspectors' level of qualification. Factor 3 (*Audit_Results*) is associated with ratios 6 and 7, which represent tax audit outcomes, including tax deficiency settlements, overdue payment surcharges and penalties or fines imposed.

Based on the three factors generated from the factor analysis, I construct a composite enforcement index that equals the average ranking for the sum of the ranks of the three factors for each province and year. I then set the variable *Tax_Enforcement* to 1 (meaning that tax enforcement measures are extensive) if the value of the composite enforcement index is above the country-level median in a given year, and 0 otherwise (meaning that tax enforcement measures are less stringent). Each sample firm is assigned a tax enforcement value of 1 or 0, to represent whether it is subjected to a more extensive or a weaker tax enforcement regime.

[Insert Table 2 about here]

Comparative Effect between Determinant Factors

I include an interaction term $RMSE \times Low_Rate$ in the regression model to examine the interactions between the tax rate effect and the delinking effect. The coefficient α_4 measures the sensitivity of reduced book-tax conformity on tax noncompliance between the high tax rate and the low tax rate groups. If the use of a lower tax rate

mitigates the negative effect that reduced book-tax conformity has on tax noncompliance, then the coefficient α_4 of this interaction term should be negative (and therefore provide support for Hypothesis 1).

Similarly, to examine whether the adoption of more stringent tax enforcement attenuates the effect that reduced book-tax conformity has on tax noncompliance, I include the interaction term *RMSE_{tax}_Enforcement* in the regression model. If the use of more stringent tax enforcement mitigates the negative effect that reduced book-tax conformity has on tax noncompliance, then the coefficient α_5 of this interaction term should be negative (and therefore provide support for Hypothesis H2).

2.4.2.2 Measures of Control Variables

In addition to the main test variables mentioned above, I include 14 mainly firm-characteristic variables in the regression model to control for the effects of these variables on a company's tax noncompliance behavior. The variable of discretionary accruals (*D_{accrual}*) is used to control for the influence that a firm's earnings management activities have on tax noncompliance. I calculate *D_{accrual}* according to the modified Jones model (1991). In China, all listed companies are required to submit audited financial statements together with their tax returns to the tax authorities. Financial reports with qualified audit opinions indicate that there are problems affecting the fair presentation of their operating results and financial positions. The tax authorities use audited book income as a benchmark for the measurement of taxable income in determining whether companies are under-reporting their income. Therefore, receiving a qualified audit opinion can trigger suspicion by the tax authorities (Hanlon 2003; Graham, Raedy, and

Shackelford 2012). Thus, I expect that companies with unqualified audit opinions have lesser tax noncompliance than companies with qualified audit opinions. Following previous empirical studies (DeFond, Wong, and Li 2000; Chan, Lin, and Mo 2006), I classify audit opinions (*Opinion*) as “qualified” if they are unqualified with an explanatory paragraph, qualified, contain a disclaimer or are adverse

As the board of directors is an internal monitoring mechanism to protect the interests of shareholders, the composition of the board influences the effectiveness of internal governance. Lo, Wong, and Firth (2010) find that firms with boards having a high percentage of independent directors have smaller magnitudes of manipulated transfer prices (which indicate a strategy to manipulate tax liabilities). Also, firms that have different persons serving as the CEO and the chairman of the board are less likely to manage earnings through transfer pricing manipulations. Following Lo et al. (2010), I include (1) percentage of independent directors (*Ind_Dir*) and (2) directors serving a dual role (*Dual_Role*) as corporate governance control variables for the regression on tax noncompliance.

I also include firm ownership (*Ownership*) as one of the control variables. I classify firms into SOEs and non-SOEs to control for the effect of corporate ownership toward tax noncompliance, as these two categories of firms have different economic and political motives toward generating tax revenue for the government.

Erickson, Hanlon, and Maydew (2004) find that executives motivated by stock-based compensation schemes may be willing to pay taxes on overstated earnings to reduce the likelihood that their earnings manipulations can be detected. Desai and Dharmapala (2006) find that increases in incentive compensation for executives tend to reduce the levels of tax sheltering. However, it is also possible that executives with a large percentage of shares may want to minimize tax payments as a

means to maximize after-tax dividend payouts. Chinese companies, however, seldom offer stock-based compensation to company executives. I thus use the percentage of shares held by executives (*Exe_Shares*) to capture the possible influence of executive compensation on tax noncompliance.

Companies with shares listed on overseas stock exchanges normally have overseas operations. These firms are less likely to be tax compliant, due to greater opportunities to design tax schemes among different affiliated companies. However, these firms are also subject to stricter regulations in other markets, and thus may be more tax compliant. I use the variable *Overseas_Shares* to control for this possible effect. Also, as Chinese firms need to meet certain performance standards before they can issue additional shares, rights-offering firms may be motivated to manipulate earnings to meet those regulatory requirements. However, these firms are also under close scrutiny by regulators in China. I use the variable *Rights_Issue* to control for this effect.

I include return on equity (*ROE*) to control for the effect of profitability on tax noncompliance. Companies with a low *ROE* are more likely to be susceptible to cash constraints over time, and may thus be less tax compliant. I include *Leverage* (total debts divided by total assets) to control for the effect of a company's borrowings on tax noncompliance. Highly leveraged firms may have a greater need to inflate book income to meet debt covenant requirements. However, Graham and Tucker (2006) and Lisowsky (2010) find that tax shelter firms have a lower leverage than their counterparts. Older firms are also more likely to become susceptible to cash constraints after going public, and are often less compliant with tax regulations (Murray 1995; Chen, Chen, and Su 2001). However, older firms may have built up their reputations over time, and may therefore be more tax compliant to protect their

reputations. I include the continuous variable *Age* (a firm's number of years in operation since its initial public offering) to control for this effect.

Large firms may be better able to devise and execute aggressive tax strategies. Hanlon, Mills, and Slemrod (2007) find that company size is positively associated with the level of tax noncompliance. Dyreng, Hanlon, and Maydew (2008) find that long-run corporate tax avoidance is positively associated with company size. However, Mills (1998) fails to find such a relationship. Furthermore, political cost theory argues that large firms should be more tax compliant due to the greater public scrutiny they face (Zimmerman 1983). I include the variable *Cosize* to control for the effect of company size.

I include the variable *Political*, which equals 1 if the CEO and the General Manager of a firm have political appointments, to control for the effect of a firm's ability to negotiate with government regulators. I expect *Political* to be negatively associated with tax noncompliance.

I include the variable *Market_Index* to reflect the different levels of market development in various provinces of China (Fan and Wang 2001 to 2011). The higher the index, the more developed the market. In a well-developed market, the business and legal environments are more complicated. Listed companies in these markets may have more opportunities for tax noncompliance, or they may have stricter regulations to follow.

Finally, I incorporate a set of dummy variables for different industries (*Industry_Dummies*) to control for industry effects on tax noncompliance. Year dummies (*Year_Dummies*) are also included in the regression model. All of the variables are defined in Appendix 1.

[Insert Appendix 1 about here]

2.5 EMPIRICAL RESULTS

2.5.1 Descriptive Statistics

Table 3 compares the descriptive statistics, the univariate tests on the tax noncompliance measures and the corporate-related characteristics of sample firms that are subject to lower STRs (25 percent or less) vs. higher STRs (greater than 25 percent) in a given year. Firms with lower statutory tax rates are generally more tax compliant, receive more unqualified audit opinions, have a higher percentage of independent directors, are more likely to combine the chairman and CEO positions, are more likely to be non-SOEs, have a higher percentage of executive-owned shares, have more overseas shares listings and have more rights offerings. These firms also tend to be older and larger, to operate in a more developed market, have a lower book-tax conformity level and operate under a less stringent tax enforcement regime.

[Insert Table 3 about here]

Table 4 compares the descriptive statistics and univariate tests on the tax noncompliance measures, and on the corporate-related characteristics of firms subject to lower vs. higher tax enforcement measures in different provinces for each year. Firms subject to greater tax enforcement monitoring are more tax compliant, receive more qualified audit opinions, have a lower percentage of independent directors, are less likely to allow a single person to serve as both CEO and board chairman, are more likely to be SOEs, have lower percentages of executive-owned shares and have fewer overseas share listings. Firms subject to greater tax enforcement also have more rights offerings, lower ROE and higher leverage ratios. These firms tend to be older and smaller, and are subject to greater political influence. They commonly operate in less developed markets, with higher tax rates and higher book-tax conformity.

[Insert Table 4 about here]

As shown in Appendix 2, all of the correlation coefficients among the variables are below 0.46. The average variance inflation factor for variables in the main regression (i.e., Table 5, column 2) is 1.25. Therefore, multicollinearity does not seem to be a problem in our multivariate regression analysis.

[Insert Appendix 2 about here]

2.5.2 Multivariate Tests

Table 5 presents the regression results for the tax noncompliance model, based on the 17,163 firm-year observations. Columns 1 and 2 present the results without and with the two interaction terms of *RMSE**Low_Rate* and *RMSE**Tax_Enforcement*.

Chan et al. (2010) find that tax noncompliance increases as book-tax conformity decreases. Appendix 3 (Panel A) presents the time-series of *RMSE* to show its increasing trend (i.e., the book-tax conformity decreases) from 2001 to 2012. I run an analysis to regress the *RMSE* on the *Year* variable, and the regression results shown in Panel B support the overall increasing trend of *RMSE* over the years. The *t*-test results shown in Panel C indicate that the mean value of *RMSE* increases from 0.0102 in the pre-2007 period (2001-2006) up to 0.0132 in the post-2007 period (2007-2012), which indicates that there is a significant decrease in book-tax conformity across these two periods (with a significant *t*-test rejecting the null hypothesis of equal means at the 1 percent level). A reduction in book-tax conformity should motivate firms to engage in tax noncompliance behavior. I find that the coefficient of *RMSE* is significantly positive in both columns 1 and 2 of Table 5. This result provides evidence that the lower the book-tax conformity, the higher the tax noncompliance. On average, the increase in the differential *ETR* is around 1.04 percent from the high to the low book-tax conformity level on average.

The coefficient of *Low_Rate* is significantly negative in both columns 1 and 2 of Table 5, which indicates that firms subject to lower corporate tax rates (equal to or less than 25 percent) are more tax compliant than their counterparts. The differential *ETR* drops by 11.3 percent when the tax rates become lower. The average mean tax rate for the high tax rate group and the low tax rate groups are 33 percent and 18 percent, respectively (i.e., a difference of 15 percent). There is, on average, about a 0.75 percent decrease in the differential *ETR* when the *STR* is reduced by 1 percent (which equals 11.3 percent divided by 15 percent).

The coefficient on *Tax_Enforcement* is also significantly negative in both columns, which supports the contention that the stricter tax enforcement measures conducted by Chinese tax authorities are effective deterrents. On average, the differential *ETR* is reduced by about 0.3 percent when the tax enforcement measures become more stringent.

As shown in column 2 of Table 5, the coefficient of *RMSE* is significantly positive, which indicates that when book-tax conformity changes from a high to a low level, the tax noncompliance increases significantly in the high tax rate group (book-tax delinking effect). The coefficient of the interaction term *RMSE x Low_Rate* is negative, indicating that the delinking effect performs differently between the high and the low tax rate groups. In other words, the effect that book-tax delinking has on tax noncompliance is lower for the low tax rate group than for the high tax rate group. This result provides evidence to support Hypothesis H1 that the negative effect of book-tax delinking on tax noncompliance is significantly attenuated by the adoption of lower tax rates. The negative effect that book-tax disconformity has on tax noncompliance is reduced by around 0.75 percent when the *STR* is reduced by 1 percent. This figure, on average, equals 11.211 (which is the coefficient of the

interaction term *RMSExLow_Rate*) divided by 15 (which is the difference between the mean tax rate for the high tax rate group and for the low tax rate group) per firm-year. As indicated in Appendix 4, the economic significance of using a high tax rate (higher than 25 percent) versus a low tax rate (25 percent or lower) to reduce under-reporting of tax liabilities is around RMB 89.9 million. This figure represents an average reduction of under-reported tax liabilities totaling around RMB 5.99 million per firm-year (which is 89.9 divided by 15) when the tax rate is reduced by 1 percent.¹⁰ The use of a lower tax rate improves tax compliance, but has its own costs in terms of lowering tax revenue. This cost is around RMB 8.02 million per firm-year on average (which is estimated based on average profits before tax, as the taxable income data are unavailable) if the government reduces the *STR* by 1 percent. Based on the above estimates, the benefits from adopting a lower tax rate to mitigate the negative effect of book-tax disconformity are able to cover around 75 percent of the costs (i.e., RMB 5.99 million divided by RMB 8.02 million).

The sum of the two variable coefficients (*RMSE* + *RMSExLow_Rate*) is not significant (-0.006 in column 2), which suggests that there is no significant book-tax delinking effect on tax noncompliance for the low tax rate group. That is, the reduction in book-tax conformity level has no significant effect on tax noncompliance when a lower tax rate is adopted. However, the coefficient of this summated variable is not significantly negative, which suggests that the adoption of a lower tax rate does not more than offset, but can only significantly reduce the negative book-tax delinking effect on tax noncompliance.

However, the coefficient of the interaction term *RMSExTax_Enforcement* is significantly negative. This result indicates that the delinking effect performs

¹⁰ The average profits before tax during the sample years is RMB 802 million per firm-year.

differently between the low and the high tax enforcement groups. The result supports Hypothesis H2 that the adoption of a more stringent tax enforcement policy can moderate the negative effect that book-tax delinking has on tax noncompliance.

The sum of two variable coefficients ($RMSE + RMSE_{Tax_Enforcement}$) represents the effect that a reduction in the conformity level has on tax noncompliance in the high tax enforcement group. However, this coefficient is significantly positive, which indicates that the adoption of more stringent tax enforcement measures is able to reduce, but not to override, the effect of book-tax delinking on tax noncompliance (i.e., there is a net increase in tax noncompliance at the lower book-tax conformity level). The negative effect of book-tax disconformity on tax noncompliance is slightly reduced (by around 0.01 percent per firm-year on average) when tax enforcement becomes more stringent. The economic significance of using more stringent tax enforcement to reduce under-reported tax liabilities is around RMB 0.1 million.

In addition, I find that the difference between the respective coefficients of the two interaction terms (i.e., coefficient of $RMSE_{Low_Rate}$ minus the coefficient of $RMSE_{Tax_Enforcement}$, which equals -11.20) is significantly negative at the 1 percent level. This result suggests that the use of lower tax rates is more effective than the use of more stringent tax enforcement to attenuate the negative effect of book-tax delinking on tax noncompliance. As the tax authorities are constrained by limited resources, and it is costly to audit a large proportion of firms, the Chinese government may rely on the use of lower tax rates to increase tax compliance.

Regarding the control variables, the regression results in Table 5 show that firms with more unqualified audit opinions (*Opinion*), that are SOEs (*Ownership*), have more rights offerings (*Rights_Issue*) and are younger (*Age*) are significantly less tax

noncompliant than their counterparts. However, firms with more overseas listings (*Overseas_Shares*), that have higher leverage (*Leverage*) and that operate in a better developed market (*Market_Index*) are more tax noncompliant than their counterparts. These results are in line with our expectations.¹¹

[Insert Table 5, Appendix 3 and Appendix 4 about here]

2.5.3 Robustness Tests

I conduct various sensitivity tests to examine the robustness of my primary research results.

2.5.3.1 Alternative Measures of Tax Noncompliance

I re-run the regression model by using alternative measures of *Diff_ETR* in which *ETR* has the following three definitions: (1) $ETR1 = [\text{income tax expenses} / (\text{profits before tax} + \text{asset impairment loss} - \text{investment income})]$; (2) $ETR2 = [(\text{income tax expense} - \text{deferred income tax expense}) / (\text{profit before tax} + \text{asset impairment loss} - \text{investment income})]$ and (3) $ETR3 = [(\text{income tax expense} - \text{deferred income tax expense}) / \text{income from operation}]$.¹² Deferred tax expense represents taxes to be paid in the future when book-tax differences are reversed. The regression results under these various definitions of *Diff-ETR* are reported in Table 6, and they are

¹¹ I exclude 838 firm-year observations with negative tax expenses or negative taxable income, and re-run the regression model (1). The re-run regression results are consistent with the main test results shown in Table 5, i.e., there is no change in the expected direction or significance of the test variables.

¹² For ETR1, I take the special characteristics of China's income tax policies into account when calculating the denominator of adjusted profits before tax. This figure is calculated as profit before tax + asset impairment loss - investment returns (Wang 2003; Wu, Rui, and Wu 2013). Asset impairment loss is added back, because this factor cannot be deducted from taxable income when investment income is subtracted, because investment income is not taxable. For ETR2, I use only the current portion of a firm's tax expense for the ETR numerator, and I exclude the deferred tax portion (following the same approach adopted by Gupta and Newberry (1997), Zeng (2011) and Wu et al. (2013)). For ETR3, I follow Wu et al. (2003) and Adhikari, Derashid, and Zhang (2006) in substituting cash flow from operations for adjusted profit before tax. This method eliminates the effects that different accounting treatments have on income.

largely similar to the main regression results shown in Table 5.

[Insert Table 6 about here]

2.5.3.2 Alternative Measures of Lower Tax Rates, Stricter Tax Enforcement and Reduction in Book-Tax Conformity

I re-run the regression model by varying the measures for the major explanatory variables. I use different cut-off points for the tax rate to replicate the main test results using regression model (1). First, I code the variable *Low_Rate* as 1 to include sample firms that are subject to corporate tax rates lower than 33 percent in a given year. *Low_Rate* is coded as 0 for firm years subject to a corporate tax rate equal to 33 percent in a given year, which is the maximum corporate tax rate during the sample period. The regression results are reported in Table 7, column 1, and they are largely similar to those of the main regression results given in Table 5.

Second, I further re-define the variable *Low_Rate* as 1 for firms subject to corporate tax rates of 15 percent or lower (which are the preferential tax rates applicable during the sample period, as mentioned earlier). The variable of *Low_Rate* is coded as 0 for firm years subject to corporate tax rates higher than 15 percent. Table 7, column 2, shows that the coefficient on $RMSE + RMSE_{xLow_Rate}$ is significantly negative, which indicates that the tax rate effect can more than offset the negative effect of the reduction in book-tax conformity.

Third, I code the variable of *Low_Rate* as 1 to include sample firms subject to a corporate tax rate equal to 25 percent in a given year (i.e., excluding firms that enjoyed preferential reduced tax rates of lower than 25 percent during the sample years). *Low_Rate* is coded as 0 for firm years subject to a corporate tax rate equal to 33 percent in a given year, which is the maximum corporate tax rate during the

sample period. The regression results are reported in Table 8, and they support both Hypotheses H1 and H2. That is, the adoption of either a lower tax rate or a stricter tax enforcement regime is able to attenuate the negative effect that reduced book-tax conformity has on tax noncompliance. The coefficient on $RMSE + RMSE_{Low_Rate}$ is significantly negative, which indicates that the tax rate effect more than offsets the negative effect of book-tax disconformity.

[Insert Table 7 and Table 8 about here]

Fourth, I use the probability of a tax audit in each province to proxy for the level of tax enforcement. For each year, the tax audit probability is calculated by the number of firms being tax audited over the total number of tax returns filed in a province. $Tax_Enforcement$ equals 1 if the probability of being audited is above the country-level median, and 0 otherwise. The results are reported in Table 9, and they indicate that stringent tax enforcement can reduce some, but cannot override the negative effect of book-tax delinking on tax noncompliance. These findings are consistent with those of the main test results shown in Table 5.

[Insert Table 9 about here]

Finally, I use an alternative measure for the variable $RMSE$ to capture the effect of the decrease in book-tax conformity level. I re-define the variable $RMSE$ by using a binary number measure to re-run the regression model. As mentioned before, $RMSE$ is the root mean squared error from a regression of current tax expense on pretax book income and dividends declared. $RMSE$ represents the book-tax conformity level in China for a given year during the period from 2001 to 2012. Here, I use a binary value for $RMSE$, with 1 indicating $RMSE$ above the median, and 0 below the median. Table 10 shows that the coefficient on $RMSE + RMSE_{Low_Rate}$ is significantly negative, which indicates that the tax rate effect more than offsets the negative effect

of book-tax disconformity. However, the coefficient of $RMSE + RMSE_{Tax_Enforcement}$ is significantly positive. This result is similar to the main test results, and confirms that stringent tax enforcement is able to reduce some, but not to override, the effect of book-tax delinking on tax noncompliance.

[Insert Table 10 about here]

2.5.4 Tax Rate Effect and Tax Enforcement Effect at Different Book-Tax Conformity Levels

To further examine whether the tax rate effect and the tax enforcement effect perform differently at different book-tax conformity levels, I continue to adopt the binary measure of $RMSE$ to proxy for the book-tax conformity level during the sample period. The variable $RMSE$ is assigned a value of 1 if a sample firm year's $RMSE$ value is above median, and 0 if it is below median.

As reported in Table 10, the coefficients of Low_Rate and $Tax_Enforcement$ are both significantly negative (-8.905 and -0.237, respectively). This result indicates that lower tax rates (and stricter tax enforcement) are able to reduce tax noncompliance at the *high* book-tax conformity level. The two respective sums of the variable coefficients (i.e., $Low_Rate + RMSE_{Low_Rate} = -17.060$ for the tax rate effect, and $Tax_Enforcement + RMSE_{Tax_Enforcement} = -0.252$ for the tax enforcement effect) are both significantly negative, which suggests that a lower tax rate (and stricter tax rate enforcement) is also able to constrain tax noncompliance at the lower book-tax conformity level.

The respective coefficients of the two interaction terms $RMSE_{Low_Rate}$ (for the tax rate effect) and $RMSE_{Tax_Enforcement}$ (for the tax enforcement effect) are both significantly negative, which suggests that the tax rate effect (and the tax

enforcement effect) performs differently at different conformity levels. In particular, the tax rate effect is more pronounced in constraining tax noncompliance at the lower book-tax conformity level. The effectiveness of stricter tax enforcement is also statistically larger at the lower conformity level.

2.5.5 The Influence of Adopting *both* Lower Tax Rates *and* More Stringent Tax Enforcement on the Delinking Effect

To further examine whether the effect of book-tax delinking on tax noncompliance performs differently when taking into account *BOTH* the use of lower tax rates and more stringent enforcement, I include an interaction term combining three variables (*RMSE**x**Low_Rate**x**Tax_Enforcement*) in the following regression model 2.

$$\begin{aligned}
 \text{Tax Noncompliance (Diff_ETR: Differential Effective Tax Rate)} = & \\
 & \alpha_0 + \alpha_1 \text{RMSE} + \alpha_2 \text{Low_Rate} + \alpha_3 \text{Tax_Enforcement} + \alpha_4 \text{RMSE} \times \text{Low_Rate} \\
 & + \alpha_5 \text{RMSE} \times \text{Tax_Enforcement} + \alpha_6 \text{RMSE} \times \text{Low_Rate} \times \text{Tax_Enforcement} \\
 & + \alpha_7 \text{DAccrual} + \alpha_8 \text{Opinion} + \alpha_9 \text{Ind_Dir} + \alpha_{10} \text{Dual_Role} + \alpha_{11} \text{Ownership} \\
 & + \alpha_{12} \text{Exe_Shares} + \alpha_{13} \text{Overseas_Shares} + \alpha_{14} \text{Rights_Issue} + \alpha_{15} \text{ROE} \\
 & + \alpha_{16} \text{Leverage} + \alpha_{17} \text{Age} + \alpha_{18} \text{Cosize} + \alpha_{19} \text{Political} + \alpha_{20} \text{Market_Index} \\
 & + \alpha_{21} \text{Industry_dummies} + \alpha_{22} \text{Year_dummies} + \varepsilon
 \end{aligned} \tag{2}$$

As indicated in Table 11, the significant positive coefficient of *RMSE* suggests that a reduction in book-tax conformity is associated with significantly high tax noncompliance in the group with high tax rates and low tax enforcement. The sum of the coefficients of *RMSE* and the respective interaction terms (including *RMSE*, *RMSE**x**Low_Rate*, *RMSE**x**Tax_Enforcement* and *RMSE**x**Low_Rate**x**Tax_Enforcement*) represents the book-tax delinking effect on noncompliance in the group with lower tax rates *and* higher tax enforcement. The coefficient is significantly negative (-0.347), indicating that upon using *both* a “lower tax rate” and “higher tax enforcement” together, the effect *more than offsets* the negative effect of delinking on tax noncompliance. The sum of the coefficients for these three interaction terms (i.e.,

RMSExLow_Rate, *RMSExTax_Enforcement* and *RMSExLow_RatexTax_Enforcement*) is significantly negative, which indicates that the effect of reduction in conformity level on tax noncompliance is significantly reduced (and more than offset) when using *both* lower tax rates and more effective enforcement.¹³

[Insert Table 11 about here]

2.6 CONCLUSIONS

This essay examines how a reduction in the book-tax conformity level interacts with the adoption of lower corporate tax rates and stricter tax enforcement to affect firms' tax noncompliance behavior. To my knowledge, this essay is the first to examine the interactions among these important factors affecting tax noncompliance. I find that the adoption of a lower tax rate reduces the negative effect that a reduction in book-tax conformity has on a firm's tax noncompliance. Stricter tax scrutiny also provides a deterrent effect on tax noncompliance. On applying *both* lower tax rates and more stringent tax enforcement, the resulting effect is *more than* offset the negative effect that delinking has on tax noncompliance. If either one of these two mitigating factors is applied individually, neither the use of a lower tax rate *nor* stringent tax enforcement can completely overcome the negative effect of book-tax disconformity on tax noncompliance.

For fiscal, social or economic reasons, tax authorities around the world are trying their best to identify cost-effective ways of reducing tax noncompliance. My research results shed light on the relative importance of various determinants of tax noncompliance. My essay is the first to analyze the comparative effects that a

¹³ I exclude 838 firm-year observations with negative tax expenses or negative taxable income to re-run the regression model (2). The results of this re-run regression are consistent with the results reported in Table 11, i.e., there is no change in the expected direction or significance of the test variables.

departure from tax-based accounting can have on tax noncompliance, taking into account the influence of lower tax rates and strengthened tax enforcement measures. The move to IFRS reporting is an international trend. Both the move toward IFRS and the cuts to tax rates are necessary policies for many countries if they hope to compete in the international market. Also, governments have an interest in ensuring the effectiveness of their tax scrutiny efforts, especially in the new IFRS reporting environment. Governments need to evaluate whether it is necessary to strengthen tax enforcement to reduce firms' incentives to engage in tax noncompliance. Hence, my research findings should be of substantial interest to regulators and policy makers in many countries, including those that have not yet decided to move toward IFRS. This essay provides evidence that the combined use of lower tax rates and stringent tax enforcement policies is an effective way to mitigate tax noncompliance in countries that are departing from tax-based accounting and moving toward the adoption of IFRS. The use of reduced tax rates has a more significant effect than tax enforcement, because lower tax rates reduce a firm's tax burden and benefit shareholders directly.

TABLE 1
Statutory Corporate Tax Rates (Percent) of European Union Countries
from 2001 to 2012

	Country/ Tax Rate	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	% change of tax rate 2001-2012
1.	Austria	34	34	34	34	25	25	25	25	25	25	25	25	-26
2.	Belgium	40	40	34	34	34	34	34	34	34	34	34	34	-15
3.	Bulgaria	28	24	24	20	15	15	10	10	10	10	10	10	-64
4.	Cyprus	28	28	15	15	10	10	10	10	10	10	10	10	-64
5.	Czech Republic	31	31	31	28	26	24	24	21	20	19	19	19	-39
6.	Denmark	30	30	30	30	28	28	25	25	25	25	25	25	-17
7.	Estonia	26	26	26	26	24	23	22	21	21	21	21	21	-19
8.	Finland	29	29	29	29	26	26	26	26	26	26	26	25	-16
9.	France	35	34	34	34	34	33	33	33	33	33	33	33	-6
10.	Germany	38	38	38	38	38	38	38	30	30	30	30	30	-23
11.	Greece	38	35	35	35	32	29	25	25	25	24	20	20	-47
12.	Hungary	18	18	18	16	16	16	16	16	16	19	19	19	+6
13.	Ireland	20	16	13	13	13	13	13	13	13	13	13	13	-38
14.	Italy	40	40	38	37	37	37	37	31	31	31	31	31	-22
15.	Latvia	29	15	15	15	15	15	15	15	15	15	15	15	-48
16.	Lithuania	24	15	15	15	15	15	15	15	20	15	15	15	-38
17.	Luxembourg	38	30	30	30	30	30	30	30	29	29	29	29	-23
18.	Malta	35	35	35	35	35	35	35	35	35	35	35	35	0
19.	Netherlands	35	35	35	35	32	30	26	26	26	26	25	25	-29
20.	Poland	28	28	27	19	19	19	19	19	19	19	19	19	-32
21.	Portugal	35	33	33	28	28	28	25	25	25	25	25	25	-29
22.	Slovak Republic	29	25	25	19	19	19	19	19	19	19	19	19	-34
23.	Romania	43	24	24	24	24	24	24	24	20	20	20	20	-53
24.	Slovenia	25	25	25	25	25	25	23	22	21	20	20	18	-28
25.	Spain	35	35	35	35	35	35	32.5	30	30	30	30	30	-14
26.	Sweden	28	28	28	28	28	28	28	28	26	26	26	26	-6
27.	United Kingdom	30	30	30	30	30	30	30	30	28	28	26	24	-20

No. of countries with tax rate reduction:	25
Average decrease of tax rate (percent):	-27
Standard derivation:	17.96

TABLE 2 Factor Loading Matrix for Tax Enforcement Measures

Ratio	Factor Loading Matrix			Rotated Factor Loading			Uniqueness	Factor Loading Coefficients		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3		Factor 1	Factor 2	Factor 3
Ratio 1	0.680	0.325	-0.059	0.618	0.299	-0.316	0.429	0.197	0.227	-0.187
Ratio 2	0.331	-0.734	-0.125	0.358	-0.732	0.027	0.336	0.136	-0.583	0.034
Ratio 3	0.811	-0.091	0.220	0.845	-0.007	0.035	0.285	0.331	0.003	0.150
Ratio 4	0.907	-0.086	-0.015	0.884	-0.075	-0.206	0.170	0.312	-0.065	-0.070
Ratio 5	-0.345	-0.063	0.799	-0.150	0.187	0.839	0.239	0.061	0.195	0.760
Ratio 6	0.394	0.500	0.434	0.436	0.616	0.155	0.406	0.195	0.506	0.238
Ratio 7	0.136	0.576	-0.353	0.003	0.437	-0.532	0.526	-0.070	0.321	-0.464
Ratio 8	-0.707	0.174	-0.098	-0.724	0.125	0.027	0.460	-0.275	0.096	-0.070
Eigenvalue	2.846	1.275	1.029							
% of Variance	35.573	15.939	12.862							
Cumulative %	35.573	51.512	64.374							

- Ratio 1 = The number of tax audits conducted over the number of tax returns filed.
- Ratio 2 = The number of cases prosecuted over the number of tax returns filed.
- Ratio 3 = The number of permanent employees over the number of taxpayers.
- Ratio 4 = The number of tax inspectors over the number of taxpayers.
- Ratio 5 = The percentage of inspectors with a bachelor's degree or higher.
- Ratio 6 = The dollar amount of tax deficiencies settled over the amount of regional tax revenue.
- Ratio 7 = The dollar amount of surcharges, penalties and fines over the amount of regional tax revenue.
- Ratio 8 = The dollar amount of surcharges, penalties and fines over the number of tax audits conducted.

TABLE 3 Descriptive Statistics on the Sample Firms' Characteristics – by Tax Rate
(Low_Rate is coded as 1 if the statutory tax rate is 25 percent or lower, and 0 otherwise)

N=17,163	<i>Low_Rate=0</i>	<i>Low_Rate=1</i>	t-statistic p-value		
	(n=3,932)	(n=13,231)			
	Mean (Standard deviation)	Mean (Standard deviation)			
<i>Diff_ETR</i>	8.8551 (12.9097)	2.6082 (10.0736)	31.8767	0.000	***
<i>RMSE</i>	0.0082 (0.0029)	0.0101 (0.0048)	-3.811	0.000	***
<i>Tax_Enforcement</i>	0.4224 (0.4940)	0.3728 (0.4835)	5.6185	0.000	***
<i>DAccrual</i>	0.0023 (0.0911)	0.0000 (0.0898)	1.3603	0.174	
<i>Opinion</i>	0.9036 (0.2952)	0.9344 (0.2476)	-6.5374	0.000	***
<i>Ind_Dir</i>	0.3211 (0.0844)	0.3361 (0.1001)	-8.5242	0.000	***
<i>Dual_Role</i>	0.1272 (0.3332)	0.1843 (0.3877)	-8.3630	0.000	***
<i>Ownership</i>	0.5287 (0.4992)	0.1904 (0.3926)	44.4123	0.000	***
<i>Exe_Shares</i>	1.4168 (7.1614)	6.7333 (16.9634)	-19.1517	0.000	***
<i>Overseas_Shares</i>	0.0237 (0.1520)	0.0337 (0.1805)	-3.1754	0.001	**
<i>Rights_Issue</i>	0.0458 (0.2090)	0.0720 (0.2585)	-5.8256	0.000	***
<i>ROE</i>	0.0581 (2.1390)	0.0397 (2.4660)	0.4230	0.672	
<i>Leverage</i>	0.5699 (0.6382)	0.5438 (2.2527)	0.7174	0.473	
<i>Age</i>	6.7900 (3.5246)	8.0115 (5.2128)	-13.7861	0.000	***
<i>Cosize</i>	21.1858 (1.0893)	21.5178 (1.2639)	-14.9096	0.000	***
<i>Political</i>	0.3327 (0.4712)	0.3438 (0.4750)	-1.2957	0.195	
<i>Market_Index</i>	7.3142 (1.8183)	8.2909 (2.3199)	-24.2748	0.000	***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 4
Descriptive Statistics on the Sample Firms' Characteristics
– by Tax Enforcement Level

	Low Tax Enforcement Group (n=10,569) Mean (Standard deviation)	High Tax Enforcement Group (n=6,594) Mean (Standard deviation)	t-statistic	p-value	
<i>Diff_ETR</i>	4.5669 (11.735)	3.7103 (10.6785)	4.9196	0.000	***
<i>RMSE</i>	0.0098 (0.0044)	0.0095 (0.0047)	3.7112	0.000	***
<i>Low_Rate</i>	0.7851 (0.4108)	0.7481 (0.4341)	5.6185	0.000	***
<i>DAccrual</i>	0.0015 (0.0900)	0.0010 (0.0902)	1.7826	0.175	
<i>Opinion</i>	0.9346 (0.2472)	0.9157 (0.2779)	4.6521	0.000	***
<i>Ind_Dir</i>	0.3382 (0.0914)	0.3238 (0.1046)	9.5104	0.000	***
<i>Dual_Role</i>	0.1906 (0.3928)	0.1401 (0.3471)	8.5491	0.000	***
<i>Ownership</i>	0.2291 (0.4203)	0.3301 (0.4703)	-14.6341	0.000	***
<i>Exe_Shares</i>	7.0075 (16.7086)	3.1235 (12.8149)	16.1448	0.000	***
<i>Overseas_Shares</i>	0.0362 (0.1869)	0.0237 (0.1520)	4.5989	0.000	***
<i>Rights_Issue</i>	0.0627 (0.2425)	0.0713 (0.2573)	-2.1934	0.028	**
<i>ROE</i>	0.0781 (1.4271)	-0.0107 (3.4150)	2.3634	0.018	**
<i>Leverage</i>	0.5197 (1.4603)	0.5981 (2.6465)	-2.4953	0.013	**
<i>Age</i>	7.5058 (5.0293)	8.0936 (4.6759)	-7.6502	0.000	***
<i>Cosize</i>	21.4842 (1.2528)	21.3737 (1.2001)	5.7071	0.000	***
<i>Political</i>	0.3300 (0.4702)	0.3593 (0.4798)	-3.9319	0.000	***
<i>Market_Index</i>	8.8546 (2.0812)	6.8049 (1.9182)	64.6552	0.000	***

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 5
Comparative Effects among Lower Tax Rates, Stricter Tax Enforcement and Reduction
in Book-Tax Conformity on Tax Noncompliance

N=17,163	Expected Sign	(1) <i>Diff_ETR</i> Coeff/[t-value]	(2) <i>Diff_ETR</i> Coeff/[t-value]
<i>Constant</i>	?	21.376*** [15.27]	12.617*** [10.70]
<i>RMSE</i>	+	1.043*** [8.63]	11.205*** [7.03]
<i>Low_Rate</i>	-	-11.284*** [-11.13]	-6.118*** [-5.40]
<i>Tax_Enforcement</i>	-	-0.262** [-2.56]	-0.310*** [-3.67]
<i>RMSExLow_Rate</i>	-		-11.211*** [-9.29]
<i>RMSExTax_Enforcement</i>	-		-0.011*** [-3.21]
<i>DAccrual</i>	?	0.696 [1.40]	0.617 [1.47]
<i>Opinion</i>	-	-0.828*** [-4.58]	-0.837*** [-5.40]
<i>Ind_Dir</i>	-	0.086 [0.03]	1.738 [0.85]
<i>Dual_Role</i>	+	-0.148 [-1.24]	-0.026 [-0.26]
<i>Ownership</i>	-	-1.739*** [-5.51]	-0.726*** [-7.96]
<i>Exe_Shares</i>	?	-0.014*** [-4.49]	0.001 [0.39]
<i>Overseas_Shares</i>	+	2.058*** [7.75]	1.107*** [4.88]
<i>Rights_Issue</i>	-	-0.718*** [-3.68]	-0.560*** [-3.58]
<i>ROE</i>	-	0.005 [0.34]	-0.015 [-1.28]
<i>Leverage</i>	?	0.053*** [2.73]	0.051*** [3.50]
<i>Age</i>	?	0.190*** [5.53]	0.040*** [3.64]
<i>Cosize</i>	?	-0.281*** [-6.14]	0.038 [0.99]
<i>Political</i>	-	-0.189** [-1.97]	-0.002 [-0.02]
<i>Market_Index</i>	?	-0.019 [-0.70]	0.142*** [6.23]
<i>RMSE + RMSExLow_Rate</i>	?		-0.006 [-0.06]
<i>RMSE + RMSExTax_Enforcement</i>	?		11.194*** [7.07]
<i>Adjusted R-squared</i>		0.512	0.670

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 6
Robustness Test: Differential Tax Rate is Calculated under Various Definitions

Diff_ETRs are calculated under three definitions (See Appendix 1)

		(1)	(2)	(3)	(4)
	Expected	<i>Diff_ETR</i>	<i>Diff_ETR1</i>	<i>Diff_ETR2</i>	<i>Diff_ETR3</i>
	Sign	(See Table 5 column 2)	Coeff/[t-value]	Coeff/[t-value]	Coeff/[t-value]
		Coeff/[t-value]			
<i>Constant</i>	?	12.617*** [10.70]	12.738*** [9.83]	12.374*** [9.48]	14.028*** [9.53]
<i>RMSE</i>	+	11.205*** [7.03]	11.229*** [7.07]	11.261*** [6.79]	11.313*** [4.86]
<i>Low_Rate</i>	-	-6.118*** [-5.40]	-6.120*** [-5.38]	-6.103*** [-5.31]	-6.122*** [-3.68]
<i>Tax_Enforcement</i>	-	-0.310*** [-3.67]	-0.278*** [-3.27]	-0.261*** [-3.89]	-0.337** [-2.47]
<i>RMSExLow_Rate</i>	-	-11.211*** [-9.29]	-11.229*** [-9.39]	-11.250*** [-8.86]	-11.161*** [-5.47]
<i>RMSExTax_Enforcement</i>	-	-0.011*** [-3.21]	-0.011*** [-3.03]	-0.010*** [-2.68]	-0.013*** [-3.16]
<i>DAccrual</i>	?	0.617 [1.47]	0.617 [1.47]	0.613 [1.41]	-0.219 [-0.22]
<i>Opinion</i>	-	-0.837*** [-5.40]	-0.858*** [-5.55]	-0.875*** [-5.54]	-0.948*** [-4.29]
<i>Ind_Dir</i>	-	1.738 [0.85]	2.716 [1.33]	3.042 [1.47]	1.491 [0.52]
<i>Dual_Role</i>	+	-0.026 [-0.26]	-0.055 [-0.53]	-0.069 [-0.64]	-0.040 [-0.33]
<i>Ownership</i>	-	-0.726*** [-7.96]	-0.701*** [-7.65]	-0.717*** [-7.63]	-0.935*** [-5.85]
<i>Exe_Shares</i>	?	0.001 [0.39]	0.002 [0.50]	0.002 [0.59]	0.001 [0.14]
<i>Overseas_Shares</i>	+	1.107*** [4.88]	1.109*** [4.93]	1.113*** [4.93]	0.987*** [4.00]
<i>Rights_Issue</i>	-	-0.560*** [-3.58]	-0.546*** [-3.50]	-0.515*** [-3.30]	-0.425** [-2.30]
<i>ROE</i>	-	-0.015 [-1.28]	-0.015 [-1.25]	-0.014 [-1.22]	-0.015 [-0.90]
<i>Leverage</i>	?	0.051*** [3.50]	0.050*** [3.47]	0.051*** [3.44]	-0.209 [-1.12]
<i>Age</i>	?	0.040*** [3.64]	0.042*** [3.78]	0.043*** [3.88]	0.042*** [2.76]
<i>Cosize</i>	?	0.038 [0.99]	0.034 [0.88]	0.045 [1.17]	0.003 [0.06]
<i>Political</i>	-	-0.002 [-0.02]	0.019 [0.23]	0.003 [0.04]	-0.017 [-0.13]
<i>Market_Index</i>	?	0.142*** [6.23]	0.131*** [5.73]	0.132*** [5.58]	0.160*** [4.86]
<i>RMSE + RMSE_Low_Rate</i>	?	-0.006 [-0.06]	0.001 [0.01]	0.011 [0.09]	0.152 [0.99]
<i>RMSE + RMSE_Tax_Enforcement</i>	?	11.194*** [7.07]	11.218*** [7.12]	11.251*** [6.84]	11.300*** [4.87]
Observations		17,163	17,163	17,163	16,995
Adjusted R-squared		0.670	0.664	0.654	0.470

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 7
Robustness Test: A Lower Tax Rate is Redefined under Various Definitions
A lower tax rate is defined using different cut-off rates: 33 percent in column 1 and 15 percent in column 2

N=17,163	Expected Sign	(1) 33 % rate <i>Diff_ETR</i> Coeff/[t-value]	(2) 15% rate <i>Diff_ETR</i> Coeff/[t-value]
<i>Constant</i>	?	13.055*** [11.05]	23.533*** [22.80]
<i>RMSE</i>	+	11.172*** [7.03]	5.935*** [4.57]
<i>Low_Rate</i>	-	-6.222*** [-5.50]	-6.641*** [-7.38]
<i>Tax_Enforcement</i>	-	-0.279*** [-3.30]	-0.167** [-2.10]
<i>RMSExLow_Rate</i>	-	-11.162*** [-9.29]	-8.990*** [-9.44]
<i>RMSExTax_Enforcement</i>	-	-0.010*** [-2.94]	-0.005** [-2.23]
<i>DAccrual</i>	?	0.624 [1.49]	-0.277 [-0.76]
<i>Opinion</i>	-	-0.823*** [-5.31]	-0.243 [-1.70]
<i>Ind_Dir</i>	-	0.939 [0.46]	-1.662 [-0.92]
<i>Dual_Role</i>	+	-0.042 [-0.42]	-0.034 [-0.38]
<i>Ownership</i>	-	-0.714*** [-7.81]	-1.801*** [-9.88]
<i>Exe_Shares</i>	?	0.001 [0.16]	0.003 [0.92]
<i>Overseas_Shares</i>	+	1.121*** [4.93]	0.825*** [3.91]
<i>Rights_Issue</i>	-	-0.564*** [-3.59]	-0.421*** [-3.12]
<i>ROE</i>	-	-0.015 [-1.26]	-0.004 [-0.49]
<i>Leverage</i>	?	0.051*** [3.50]	0.014 [1.46]
<i>Age</i>	?	0.032*** [2.89]	0.265*** [2.97]
<i>Cosize</i>	?	0.032 [0.83]	-0.278*** [-8.18]
<i>Political</i>	-	0.017 [0.21]	-0.211*** [-2.90]
<i>Market_Index</i>	?	0.137*** [6.02]	0.087*** [4.19]
<i>RMSE + RMSExLow_Rate</i>	?	0.009 [0.08]	-3.055*** [-3.72]
<i>RMSE + RMSExTax_Enforcement</i>	?	11.162*** [7.07]	5.930*** [4.61]
<i>Adjusted R-squared</i>		0.669	0.723

Industry dummies and year dummies are included, but are not reported for brevity.

Column 1: *Low_Rate* = 1 for samples subject to tax rates lower than 33 percent, and 0 for samples subject to a 33 percent tax rate.

Column 2: *Low_Rate* = 1 for samples subject to tax rates of 15 percent or lower, and 0 for samples subject to tax rates higher than 15 percent.

*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.

All variables are defined in Appendix 1.

TABLE 8
Robustness Test: Samples Subject to Reduced Rate
Preferential Treatment Are Excluded

Low_Rate = 1 for samples subject to a tax rate of 25 percent, and 0 for samples subject to a tax rate of 33 percent (i.e., excluding samples subject to reduced tax rate preferential treatment).

N=7,713	Expected Sign	<i>Diff_ETR</i> Coeff/[t-value]
<i>Constant</i>	?	16.661*** [12.49]
<i>RMSE</i>	+	5.693*** [4.13]
<i>Low_Rate</i>	-	-6.360*** [-8.26]
<i>Tax_Enforcement</i>	-	-0.079** [-2.36]
<i>RMSExLow_Rate</i>	-	-6.453*** [-5.81]
<i>RMSExTax_Enforcement</i>	-	-0.007*** [-4.62]
<i>DAccrual</i>	?	0.269 [1.71]
<i>Opinion</i>	-	0.017 [0.25]
<i>Ind_Dir</i>	-	-1.045 [-0.10]
<i>Dual_Role</i>	+	-0.033 [-0.85]
<i>Ownership</i>	-	-2.150*** [-4.60]
<i>Exe_Shares</i>	?	-0.006*** [-4.04]
<i>Overseas_Shares</i>	+	0.091 [1.22]
<i>Rights_Issue</i>	-	-0.120** [-2.52]
<i>ROE</i>	-	-0.003 [-0.58]
<i>Leverage</i>	?	0.020** [2.42]
<i>Age</i>	?	0.067*** [3.06]
<i>Cosize</i>	?	-0.077*** [-5.73]
<i>Political</i>	-	-0.058 [-1.81]
<i>Market_Index</i>	?	0.149*** [7.62]
<i>RMSE + RMSExLow_Rate</i>	?	-0.760*** [-3.12]
<i>RMSE + RMSExTax_Enforcement</i>	?	5.686*** [4.113]
<i>Adjusted R-squared</i>		0.702

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 9
Robustness Test: Tax Enforcement is Measured by the
Likelihood of Being Tax Audited

Tax_Enforcement is measured by the likelihood of being tax audited. This variable is coded as 1 if it is higher than sample median, and 0 if it is lower than sample median.

N=17,163	Expected Sign	<i>Diff_ETR</i> Coeff/[t-value]
<i>Constant</i>	?	14.820*** [12.49]
<i>RMSE</i>	+	10.714*** [6.45]
<i>Low_Rate</i>	-	-6.109*** [-5.43]
<i>Tax_Enforcement</i>	-	-0.676*** [-10.56]
<i>RMSExLow_Rate</i>	-	-11.571*** [-9.19]
<i>RMSExTax_Enforcement</i>	-	-0.015*** [-3.53]
<i>DAccrual</i>	?	0.611 [1.46]
<i>Opinion</i>	-	-0.826*** [-5.34]
<i>Ind_Dir</i>	-	1.180 [0.58]
<i>Dual_Role</i>	+	-0.087 [-0.87]
<i>Ownership</i>	-	-0.945*** [-10.23]
<i>Exe_Shares</i>	?	-0.001 [-0.33]
<i>Overseas_Shares</i>	+	1.118*** [4.99]
<i>Rights_Issue</i>	-	-0.536*** [-3.44]
<i>ROE</i>	-	-0.012 [-0.96]
<i>Leverage</i>	?	0.051*** [3.48]
<i>Age</i>	?	0.034*** [3.12]
<i>Cosize</i>	?	0.006 [0.15]
<i>Political</i>	-	0.001 [0.02]
<i>Market_Index</i>	?	-0.000 [-0.01]
<i>RMSE + RMSExLow_Rate</i>	?	-0.857*** [-6.00]
<i>RMSE + RMSExTax_Enforcement</i>	?	10.699*** [6.37]
<i>Adjusted R-squared</i>		0.671

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 10
Tax Rate Effect and Tax Enforcement Effect at Different Book-Tax Conformity Levels
RMSE is coded as 1 if the value is higher than its median, and 0 if it is lower than its median.

N=17,163	Expected Sign	<i>Diff_ETR</i> Coeff/[t-value]
<i>Constant</i>	?	16.190*** [12.53]
<i>RMSE</i>	+	7.568*** [5.31]
<i>Low_Rate</i>	-	-8.905*** [-7.78]
<i>Tax_Enforcement</i>	-	-0.237** [-2.47]
<i>RMSExLow_Rate</i>	-	-8.155*** [-7.05]
<i>RMSExTax_Enforcement</i>	-	-0.015*** [-3.00]
<i>DAccrual</i>	?	0.584 [1.27]
<i>Opinion</i>	-	-0.772*** [-4.48]
<i>Ind_Dir</i>	-	1.494 [0.66]
<i>Dual_Role</i>	+	-0.021 [-0.19]
<i>Ownership</i>	-	-1.647*** [-5.06]
<i>Exe_Shares</i>	?	-0.001 [-0.19]
<i>Overseas_Shares</i>	+	1.482*** [5.96]
<i>Rights_Issue</i>	-	-0.655*** [-3.75]
<i>ROE</i>	-	-0.007 [-0.64]
<i>Leverage</i>	?	0.051*** [3.22]
<i>Age</i>	?	0.071*** [6.04]
<i>Cosize</i>	?	-0.079 [-1.89]
<i>Political</i>	-	-0.084 [-0.94]
<i>Market_Index</i>	?	0.097*** [3.83]
<i>RMSE + RMSExLow_Rate</i>	?	-0.587*** [-0.42]
<i>RMSE + RMSExTax_Enforcement</i>	?	7.553*** [5.42]
<i>Low_Rate + RMSExLow_Rate</i>	?	-17.060*** [-9.56]
<i>Tax_Enforcement+ RMSExTax_Enforcement</i>	?	-0.252*** [-2.63]
<i>Adjusted R-squared</i>		0.585

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

TABLE 11
The Influence of Adopting *both* Lower Tax Rates and
More Stringent Tax Enforcement on the Delinking Effect

N=17,163	Exp. Sign	<i>Diff_ETR</i> Coeff/(t-statistic)
<i>Intercept</i>	?	12.430*** [10.53]
RMSE	+	11.197*** [7.03]
<i>Low_Rate</i>	-	-6.110*** [-5.39]
<i>Tax_Enforcement</i>	-	-0.699*** [-6.19]
<i>RMSE x Low_Rate</i>	-	-11.021*** [-8.61]
<i>RMSE x Tax_Enforcement</i>	-	-0.009*** [-2.69]
<i>RMSE x Low_Rate x Tax_Enforcement</i>	-	-0.514*** [-4.27]
<i>DAccrual</i>	?	0.636 [1.51]
<i>Opinion</i>	-	-0.839*** [-5.41]
<i>Ind_Dir</i>	-	1.781 [0.88]
<i>Dual_Role</i>	+	-0.029 [-0.29]
<i>Ownership</i>	-	-0.708*** [-7.75]
<i>Exe_Shares</i>	?	0.001 [0.39]
<i>Overseas_Shares</i>	+	1.103*** [4.87]
<i>Rights_Issue</i>	-	-0.551*** [-3.53]
<i>ROE</i>	-	-0.015 [-1.24]
<i>Leverage</i>	?	0.051*** [3.48]
<i>Age</i>	?	0.042*** [3.76]
<i>Cosize</i>	?	0.038 [1.00]
<i>Political</i>	-	0.001 [0.02]
<i>Market_Index</i>	?	0.141*** [6.20]
<i>RMSE + RMSExLow_Rate</i>	?	0.176 [1.42]
<i>RMSE + RMSExTax_Enforcement</i>	?	11.188*** [7.08]
<i>RMSE + RMSExLow_Rate + RMSEx Tax_Enforcement + RMSExLow_RatexTax_Enforcement</i>	?	-0.347** [-2.50]
<i>RMSExLow_Rate + RMSExTax_Enforcement + RMSExLow_RatexTax_Enforcement</i>	?	-11.544*** [-8.03]
Adjusted R-squared		0.670

Industry dummies and year dummies are included, but are not reported for brevity.
*** and ** indicate two-tailed significance at the 1 percent and 5 percent levels, respectively.
All variables are defined in Appendix 1.

APPENDIX 1

Definition of Variables

<i>Diff_ETR</i>	= difference between the statutory tax rate (STR) and the effective tax rate (ETR), where $ETR = \text{Income Tax Expense} / \text{Profit Before Tax}$. A larger <i>Diff-ETR</i> denotes more tax noncompliance.
<i>Diff_ETR1</i>	= difference between the statutory tax rate (STR) and the effective tax rate 1 (ETR1), where $ETR1 = \text{Income Tax Expense} / (\text{Profit Before Tax} + \text{Impairment Loss} - \text{Investment Income})$. A larger <i>Diff-ETR</i> denotes more tax noncompliance.
<i>Diff_ETR2</i>	= difference between the statutory tax rate (STR) and the effective tax rate 2 (ETR2), where $ETR2 = (\text{Income Tax Expense} - \text{Deferred Income Tax Expense}) / (\text{Profit Before Tax} + \text{Impairment Loss} - \text{Investment Income})$. A larger <i>Diff-ETR</i> denotes more tax noncompliance.
<i>Diff_ETR3</i>	= difference between the statutory tax rate (STR) and the effective tax rate 3 (ETR3), where $ETR3 = (\text{Income Tax Expense} - \text{Deferred Income Tax Expense}) / \text{Cash Flow from Operation}$. A larger <i>Diff-ETR</i> denotes more tax noncompliance.
<i>RMSE</i>	= root mean squared error derived from the regression of current tax expense on pretax book income and dividend declared in a given year (Atwood et al. 2010). The higher the value of RMSE, the lower the book-tax conformity.
<i>Low_Rate</i>	= 1 for samples subject to statutory corporate tax rate of 25 percent or lower , 0 for samples subject to tax rate of higher than 25 percent.
<i>Tax_Enforcement</i>	= 1 if the average ranking of the sum of the ranks for <i>Tax_Audit</i> , <i>Qualification</i> , <i>Audit_Results</i> is above the country level median, 0 otherwise. Regional tax enforcement measures adopted by tax authorities in China.
<i>DAccrual</i>	= discretionary accrual of a company based on the modified Jones (1991) model.
<i>Opinion</i>	= 1 if a company receives an unqualified audit opinion in the year, 0 otherwise.
<i>Ind_Dir</i>	= number of independent directors over the total number of directors on the board.
<i>Dual_Role</i>	= 1 if the Chairman and the CEO of a company is the same person, 0 otherwise
<i>Ownership</i>	= 1 if a company is SOEs, 0 otherwise
<i>Exe_Shares</i>	= number of shares held by senior executives divided by total number of shares of the company at the end of the year.
<i>Overseas_Shares</i>	= 1 if a company has shares listed in an overseas stock exchange, 0 otherwise.
<i>Rights_Issue</i>	= 1 if a company raises additional capital in the succeeding year, 0 otherwise.
<i>ROE</i>	= the ratio of net income before tax to equity.
<i>Leverage</i>	= total debts divided by total assets at the end of the year.
<i>Age</i>	= number of years of operation since the initial public offering of the firm.
<i>Cosize</i>	= the natural logarithm of a company's year-end total assets.
<i>Political</i>	= 1 if both the Chief Executive Officer and the General Manager of a company have political appointments in China, 0 otherwise.
<i>Market_Index</i>	= Composite index reflecting the market development calculated from the following five aspects: (1) the relationship between government and market, such as the role of markets in allocating resources and enterprise burden in addition to normal taxes; (2) the development of non-state business, such as the ratio of industrial output by the private sector to total industrial outputs; (3) the development of product markets, such as regional trade barriers; (4) the development of factor markets such as foreign direct investment and the mobility of labor; and (5) the development of market intermediaries (including auditors) and legal environment (Fan and Wang (2001 to 2009)). A higher index suggests a more developed market.

APPENDIX 2 Pearson Correlation Table for the Independent Variables Used in the Main Regression

<i>Coeff/p-value</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
<i>RMSE (1)</i>	1.000																
<i>Low_Rate (2)</i>	0.167 0.000	1.000															
<i>Tax_Enforcement (3)</i>	-0.019 0.008	-0.046 0.000	1.000														
<i>DAccrual (4)</i>	-0.014 0.056	-0.008 0.304	-0.009 0.218	1.000													
<i>Opinion (5)</i>	0.062 0.000	0.048 0.000	-0.027 0.000	0.147 0.000	1.000												
<i>Ind_Dir (6)</i>	0.162 0.000	0.081 0.000	-0.026 0.000	-0.015 0.042	0.005 0.496	1.000											
<i>Dual_Role (7)</i>	0.082 0.000	0.058 0.000	-0.058 0.000	0.012 0.093	-0.005 0.456	0.076 0.000	1.000										
<i>Ownership (8)</i>	0.455 0.000	0.315 0.000	-0.100 0.000	0.006 0.401	0.094 0.000	0.193 0.000	0.092 0.000	1.000									
<i>Exe_Shares (9)</i>	0.177 0.000	0.136 0.000	-0.112 0.000	0.076 0.000	0.084 0.000	0.088 0.000	0.230 0.000	0.201 0.000	1.000								
<i>Overseas_Shares (10)</i>	0.003 0.722	0.026 0.000	-0.047 0.000	-0.019 0.011	0.019 0.008	0.043 0.000	-0.052 0.000	0.006 0.406	-0.059 0.000	1.000							
<i>Rights_Issue (11)</i>	0.009 0.207	0.045 0.000	0.018 0.013	0.047 0.000	0.059 0.000	0.000 0.976	-0.019 0.008	0.055 0.000	-0.033 0.000	0.000 0.993	1.000						
<i>ROE (12)</i>	0.007 0.368	0.003 0.693	-0.012 0.097	0.012 0.115	-0.009 0.205	0.011 0.136	0.021 0.005	0.013 0.078	0.001 0.938	0.001 0.859	0.002 0.814	1.000					
<i>Leverage (13)</i>	-0.003 0.663	-0.004 0.623	0.006 0.397	-0.056 0.000	-0.171 0.000	0.034 0.000	-0.003 0.697	-0.010 0.159	-0.043 0.000	0.000 0.988	-0.010 0.158	-0.100 0.000	1.000				
<i>Age (14)</i>	0.188 0.000	0.110 0.000	0.045 0.000	-0.108 0.000	-0.110 0.000	0.064 0.000	-0.123 0.000	0.202 0.000	-0.392 0.000	-0.021 0.004	0.044 0.000	0.012 0.099	0.075 0.000	1.000			
<i>Cosize (15)</i>	0.147 0.000	0.105 0.000	-0.060 0.000	0.013 0.079	0.225 0.000	0.067 0.000	-0.123 0.000	0.167 0.000	-0.127 0.000	0.389 0.000	0.144 0.000	0.002 0.790	-0.120 0.000	0.129 0.000	1.000		
<i>Political (16)</i>	-0.028 0.000	0.004 0.547	0.025 0.001	0.021 0.004	0.063 0.000	-0.022 0.003	0.113 0.000	-0.037 0.000	-0.042 0.000	-0.006 0.447	0.014 0.063	0.012 0.100	-0.012 0.094	-0.005 0.495	0.120 0.000	1.000	
<i>Market_Index (17)</i>	0.291 0.000	0.187 0.000	-0.441 0.000	0.012 0.110	0.082 0.000	0.122 0.000	0.122 0.000	0.421 0.000	0.246 0.000	0.063 0.000	-0.003 0.659	0.009 0.219	-0.012 0.101	0.091 0.000	0.151 0.000	-0.056 0.000	1.000

APPENDIX 3

Panel A: Time Series of *RMSE* for the Years from 2001 to 2012

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<i>RMSE</i>	0.0088	0.0081	0.0099	0.0112	0.0115	0.0114	0.0131	0.0116	0.0125	0.0127	0.0129	0.0161

Panel B: Regression Results of *RMSE* on *Year*, Showing the Overall Increasing Trend of *RMSE* from 2001 to 2012

	Expected Sign	<i>RMSE</i> Coeff/(t-statistic)
<i>Year</i>	+	0.0005*** [6.61]
<i>Adjusted R-squared</i>		0.795

*** indicates two-tailed significance at the 1 percent level.

Panel C: Comparison of Mean Values of *RMSE* in the Pre-2007 and Post-2007 Periods

	Pre-2007 Mean (Standard deviation)	Post-2007 Mean (Standard deviation)	t-statistic	p-value
<i>RMSE</i>	0.0102 (0.0014)	0.0132 (0.0015)	-3.4649	0.005 ***

*** indicates two-tailed significance at the 1 percent level.

APPENDIX 4

Calculations for the Economic Significance of Using Lower Tax Rates and Stricter Tax Enforcement to Reduce Under-reported Tax Liabilities

	Reduction of Under-reported Tax Liabilities in the amount of: (per firm year on average, in RMB)
Use of Lower Statutory Tax Rate (see note 1 below)	5.99 million
Use of Stricter Tax Enforcement (see note 2 below)	0.1 million

Note: The calculation of the economic significance is as follows:

1. Reduction of under-reported tax liabilities (i.e., increase in reported tax burden) when statutory tax rate is reduced by 1 percent (per firm year on average)

= Average profits before tax during the sample years (per firm-year) x coefficient of *RMSExLow_Rate* x (1/ difference between mean tax rate for the high and the low tax rate group)

$$\text{= } 802 \times (11.211/100) \times (1/15)$$

$$\text{= } \underline{5.99}$$

2. Reduction of under-reported tax liabilities when stricter tax enforcement (high vs. low) is adopted (per firm year on average)

= Average profits before tax during the sample years (per firm-year) x coefficient of *RMSExTax_Enforcement*

$$\text{= } 802 \times (0.011/100)$$

$$\text{= } \underline{0.1}$$

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