University of Reading

Executive cash compensation and tax aggressiveness of Chinese firms

Article

Accepted Version

Huang, W., Ying, T. and Shen, Y. ORCID: https://orcid.org/0000-0002-2943-6022 (2018) Executive cash compensation and tax aggressiveness of Chinese firms. Review of Quantitative Finance and Accounting, 51 (4). pp. 1151-1180. ISSN 1573-7179 doi: 10.1007/s11156-018-0700-2 Available at https://centaur.reading.ac.uk/74768/

It is advisable to refer to the publisher's version if you intend to cite from the work. See Guidance on citing.

To link to this article DOI: http://dx.doi.org/10.1007/s11156-018-0700-2

Publisher: Springer

All outputs in CentAUR are protected by Intellectual Property Rights law, including copyright law. Copyright and IPR is retained by the creators or other copyright holders. Terms and conditions for use of this material are defined in the End User Agreement.

www.reading.ac.uk/centaur

CentAUR

University of Reading

Central Archive at the University of Reading

Reading's research outputs online

Executive cash compensation and tax aggressiveness of Chinese firms

Abstract

We examine the influence of corporate compensation policies on firms' tax aggressiveness in an emerging market where executive compensation is primarily in cash form. Based on a hand-collected dataset of 958 firm-year observations of Chinese listed firms for the 2006-2012 period, we find that firms paying higher executive cash compensation are associated with lower tax aggressiveness. This relationship also holds for the excess cash compensation measures which control for executive shareholding, firm profitability, size, growth opportunity, and board independence. We further document that mutual funds ownership pressure firms paying higher compensation to reduce their tax aggressiveness, suggesting adverse selection by mutual funds on firms exhibiting risky tax avoidance activities. High leverage offsets the negative link between cash compensation and tax aggressiveness, indicating a complementary effect between debt and tax avoidance, and, hence, suggesting that creditor monitoring is weak. These results are robust to the system-GMM estimation, which simultaneously account for the endogeneity of executive compensation, tax aggressiveness, ownership and control, leverage, and corporate governance. Our findings on Chinese firms have important policy implications for developing countries around the world with concentrated ownership structure, weak institutional environment, widespread corruption, ineffective rule of law, and ongoing significant social and political transformation.

Key words: Tax aggressiveness; executive compensation; ownership; leverage; China

JEL classifications: G3; M4

1. Introduction

We have an incomplete understanding of firms' tax avoidance activities which, in its more extreme form, is often referred to as tax aggressiveness. Prior studies reveal that firm level attributes determine corporate tax aggressiveness. These include profitability, foreign operations, asset tangibility, research and development, leverage, and financial reporting aggressiveness (see Shevlin, 2007; Rego and Wilson, 2012; and Richardson et al., 2013, 2014 for reviews). It is generally expected that shareholders prefer reduced tax liabilities and, hence, firms exhibit tax aggressiveness. Tax aggressiveness, however, engenders significant risk for firms especially in absence of effective corporate governance mechanisms that can mitigate managerial rent-seeking masked by tax avoidance activities (Desai and Dharmapala, 2006, 2009; Hanlon and Slemrod, 2009; Kim et al., 2011; Armstrong et al., 2015). An important strand of this literature has looked at the influence of executive compensation, as an important governance mechanism, on firm tax avoidance and suggests that the level of equity-based compensation is positively associated with the extent of corporate tax avoidance (Phillips, 2003; Minnick and Noga, 2010; Armstrong et al., 2012, 2015; Rego and Wilson, 2012). This is because risky tax avoidance activities increase stock return volatility and the value of stock option portfolios that are associated with the equity-based executive compensation. Also, Rego and Wilson (2012) argue that managers must be incentivized to engage in tax avoidance activities that are expected to generate net risk-adjusted benefits for the shareholders.

In contrast to the incentives embedded in executive options and share ownership, which, according to agency theory, can improve the alignment of managers' and shareholders' interests (Jensen and Meckling, 1976; Jensen and Murphy, 1990; Chien et al., 2016), non-equity based compensation, mainly including salary and bonus, has attracted much less attention regarding its influence on tax aggressiveness. Armstrong et al. (2012), for example, examine the association between total executive compensation and firm tax avoidance and find the association statistically insignificant when total CEO/CFO compensation is used to measure executive compensation. It is uncertain whether this finding can be generalized to international markets especially where compensation practices are very different from the US. Further, prior evidence suggests that cash compensation is more sensitive to negative returns as it is to positive returns (e.g., Lambert and Larcker, 1987; Leone et al., 2006). Under the premise that stock market reacts negatively to the news on firms' tax aggressiveness activities (Hanlon and Slemrod, 2009; Kim et al., 2011), the

association between cash compensation and tax aggressiveness is of critical importance especially in an institutional environment where executive compensation is primarily in cash form. In the absence of executive stock option incentives, firms would engage in tax avoidance when the benefit of tax liabilities reduction outweighs the incremental costs, such as legal and accounting fees, as well as reputation penalties. Nonetheless, risk-averse managers are more likely to undertake less risky tax planning.

This paper aims to fill this research gap by investigating the influence of executive compensation on tax aggressiveness of Chinese listed firms. According to Cai and Liu (2009), tax avoidance activities in China are widespread due to the weak enforcement of tax laws. In particular, a lack of manpower to deal with the tax-related issues for increasing number of listed firms, insufficient training and skills, and ineffective management of the tax collection agency, etc. The Chinese market is particularly suitable for extending this strand of literature as executive compensations among its listed companies are mostly cash based (Firth et al., 2006, 2007; Chen et al., 2011; Conyon and He, 2011).[1] Listed firms in China maintain a two-tier board system consisting of a board of directors and a board of supervisors. Ding et al. (2010) provide a comprehensive review from a legal perspective on China's corporate governance system. This study finds that after the new Corporate Law became effective in 2006, total executive compensation is associated with both the size and the meeting frequency of the supervisory board. As most listed companies are "carve-outs" from the former State Owned Enterprises (SOEs), often politicians are appointed as the executives and directors (Sun and Tong, 2003; Firth et al., 2006). Moreover, unlike the corporate governance research on US firms which focuses on the principal-agent conflict between shareholders and managers (Jensen and Meckling, 1976; Jensen and Murphy, 1990), more recent research, conducted in emerging markets such as China, suggests "tunneling" as the primary type of agency cost arising from the principal-principal conflict between the controlling shareholders and the minority investors (La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002; Lins, 2003; Jiang et al., 2010; Liu and Tian, 2012; Qian and Yueng, 2015; Huang, 2016; Guo, 2016). Given the concentrated ownership structure, the

[1] Conyon and He (2011) and Chen et al. (2011) review the compensation disclosure requirement by The Chinese Securities Regulation Committee (CSRC). Under the Chinese context, CSRC defines "top management" as all executives, directors, and supervisors. Total compensation paid to executives and board members includes salary, bonus, stipends, and other benefits.

controlling shareholders have dominant influence over the corporate policies and the principal-agent conflict is relatively less severe than the principal-principal conflict. Consequently, equity-based incentive compensation is not as widely adopted by Chinese firms as by the US firms. Studying tax aggressiveness under the Chinese setting, hence, sheds further light on the links among corporate governance, corporate compensation practices, and tax aggressiveness.

This paper also offers timely insights into the association between executive compensation and corporate tax avoidance activities against the backdrop of the convergence of Chinese GAAP with IFRS over the past two decades (Peng and Smith, 2010; Cang et al., 2014; and Hou et al., 2014) and the more recent anti-corruption campaign initiated by the Chinese government (see Pan and Tian, 2017 for a review). Since 2012, the Chinese GAAP has imposed more stringent requirements over internal control disclosure and audit procedures, similar to the Sarbanes-Oxley Act of 2002 (SOX), particularly, with regard to the mandatory disclosure of internal control weaknesses (ICWs). Prior to this regulatory change, ICWs were disclosed voluntarily in the audit reports in China (See Chen et al., 2016 and Ji et al., 2017 for reviews). Chan and Chow (1997) further point out that tax audits in China differ among listed firms, with the difference depending on firms' profitability level and ownership structure. Similar as in the US, significantly more focus has been put on the tax risk in China due to the high rate of tax-related internal control deficiencies, as well as the strengthened public enforcement against financial fraud by CSRC (Hung et al., 2015).

In a similar vein, Cohen et al. (2009) indicate that the association between equity risk incentives and managerial risk taking has weakened in the US since the SOX. There is, therefore, a general trend towards more corporate transparency and stronger public governance, which calls for more policy research. For instance, Hou et al. (2014) find strong evidence supporting the positive role of mandatory IFRS adoption on the relationship between accounting-based performance and executive compensation in China. Houqe and Monem (2016) analyze a sample of 104 countries over the period 2009-2011 and suggest that the length of IFRS experience and the extent of accounting disclosure are negatively related to the perceived level of corruption in a country. More importantly, developing countries benefit more from IFRS experience in lowering their perceived levels of corruption. Hence, our findings on Chinese firms have important policy implications for developing countries around the world with concentrated ownership structure, weak institutional environment, widespread corruption, ineffective legal system, and ongoing

significant social and political transformation (Lins, 2003; Shleifer and Vishny, 1993; La Porta et al., 1999).

In summary, we contribute to the extant literature in two ways. First, we provide an important extension of the literature on corporate compensation practices and tax avoidance activities by focusing on cash compensation. Second, we explore two possible channels through which the external monitoring agents, i.e., mutual funds and creditors, under the Chinese institutional environment, may influence the relationship between cash compensation and tax aggressiveness. We find that firms paying higher executive cash compensation, or higher excess cash compensation, exhibit lower tax aggressiveness. Mutual funds ownership strengthens the negative link between excess cash compensation and tax aggressiveness. These findings indicate that when internal governance is weak, firms paying excess compensation reduce the extent of their aggressive tax avoidance activities to avoid the adverse selection problem. We also find that the level of financial leverage is positively associated with the degree of tax aggressiveness, indicating a complementary relationship between the two and the weak external monitoring role played by the debt-holders in China.

The remainder of the paper is structured as follows: Section 2 reviews the research background and develops our hypotheses. Section 3 describes our sample and methods. Section 4 discusses the results. Section 5 concludes.

2. Research background and hypotheses development

2.1 Tax aggressiveness and firm value

Extant research on corporate tax aggressiveness offers two competing views on its economic consequences. A traditional view considers tax aggressiveness as value enhancing as it reduces corporate tax burden at the cost of state tax revenues. The associated risk is being detected by external auditors and tax authorities. Studies such as Graham and Tucker (2006) find that investors hold this value-enhancing view. Consequently, several studies have explored the factors that may enhance a firm's tax avoidance ability. Phillip (2003) documents that compensating managers on the basis of after-tax performance measures lowers a firm's effective tax rates. Rego and Wilson (2012) argue that tax aggressiveness involves significant uncertainty, and the managerial incentives embedded in the stock options motivate managers to undertake risky tax avoidance activities. Similarly, Minnick and Noga (2010) find that tax avoidance benefits

shareholders in the long-run and that incentive-based compensation drives managers to invest in tax management. Armstrong et al. (2012) show that the incentive compensation of the tax director is negatively related to the reported tax expenses. Although these prior studies acknowledge the direct costs of tax aggressiveness (i.e., fees paid to the accountants and attorneys, the managerial time devoted to planning for and resolving audits with tax authorities), the other significant indirect costs associated with tax aggressiveness are often overlooked. As Chen and Chu (2005) and Crocker and Slemrod (2005) have pointed out in their studies, this traditional view ignores the associated agency costs of tax avoidance.

A competing view of tax avoidance adopts the agency theory framework (Jensen and Meckling, 1976; Jensen and Murphy, 1990) and suggests that in a weak corporate governance environment, tax aggressiveness can be detrimental to shareholder value due to managerial resource diversions (Chen and Chu, 2005; Crocker and Slemrod, 2005; Desai and Dharmapala, 2006, 2009). Tax aggressiveness engenders significant risk for both firms and managers and reduces shareholder value in absence of effective governance mechanisms (Desai and Dharmapala, 2006, 2009; Hanlon and Slemrod, 2009; Kim et al., 2011; Rego and Wilson, 2012; Armstrong et al., 2015). Desai and Dharmapala (2006; 2009) provide empirical evidence of the managerial resource diversion facilitated by tax avoidance and their findings further suggest that tax aggressiveness can incentivize managers to hide bad news and mislead investors. This strand of literature has also examined the stock market consequences of tax aggressiveness from the agency perspective. Minnick and Noga (2010) suggest that tax aggressiveness is detrimental to shareholder value especially in the short-run, and they nonetheless also document the long-run value gains from tax planning. Hasan et al. (2014) further indicate that firms engaging in risky tax avoidance are subject to investor adverse selection. Hanlon and Slemrod (2009) document a negative market reaction to the news about firms' tax sheltering activities. This negative reaction is less pronounced for firms with stronger governance. Kim et al. (2011) find tax avoidance activities facilitate both managerial rent seeking and bad news hoarding by providing tools, masks, and justifications for these behaviours. Accumulation of such bad news leads to the risk of future stock price crash, and strong external monitoring mechanisms, such as institutional ownership, analyst coverage, and takeover threat, can attenuate this type of risk.

2.2 Hypotheses development

Tax represent a significant cost to a firm and its shareholders, and, hence, it is generally expected that shareholders prefer tax aggressiveness. However, this argument ignores the potential non-tax costs that can accompany tax aggressiveness, especially those arising from agency problems (Chen et al., 2010). Studies such as Desai and Dharmapala (2006, 2009), Hanlon and Slemrod (2009), Kim et al. (2011) and Armstrong et al. (2015) have provided extensive evidence that tax aggressiveness engenders significant risk for both firms and managers with the absence of effective corporate governance mechanisms. Further, this body of literature has documented a positive association between equity-based incentive compensation and tax aggressiveness, provided that risky tax avoidance activities increases stock volatility which in turn increases the values of executive stock options (Minnick and Noga, 2010; Armstrong et al., 2012, 2015; and Rego and Wilson, 2012). With regard to the non-equity compensation, Healy (1985) suggests that cash compensation encourages managers to focus on short-term objectives, and, Minnick and Noga (2010) argue that tax aggressiveness is detrimental to shareholder value in the short-run but benefits shareholders in the long-run, and that incentive compensation encourages tax management. Compared to equity-incentives, cash salaries and bonus contracts are usually linked with accounting earnings and not explicitly with stock returns (Duru et al., 2005, 2012). This short-run interest alignment motivates managers whose compensation are in cash form to reduce tax avoidance activities.

In addition, managers receiving higher compensation may be subject to stricter scrutiny, and, hence, may be pressured to reduce tax avoidance activities and to improve corporate transparency in order to avoid the adverse selection problems associated with both shareholders and creditors (Hasan et al., 2014; Chung et al., 2015). With respect of the creditors, Kabir et al. (2013) find that corporate bondholders are fully aware of both risk-taking and risk-avoiding incentives created by the various executive pay components. With regard to the shareholders, Hanlon and Slemrod (2009) document the existence of reputation penalties when aggressive tax avoidance becomes public knowledge and suggest that these penalties negatively affect investors' assessments of the firm value. As a result, adverse selection increases both the cost of debt and the cost of equity, leading to stock price discounts. Chen et al. (2010) document that family-owned firms in the US are less tax aggressive than their counterparts which suggests that these family firms are willing to forgo tax benefits to avoid a potential price discount, a typical non-tax-related cost that can arise when minority shareholders become concerned with the family rent-seeking

masked by tax avoidance activities. Therefore, we expect that, when executive compensation is in cash form, i.e., in absence of the stock option incentives, Chinese firms would engage in less tax avoidance activities, because all the combined costs incurred, for example, the costs of legal/accounting fees and the discounts of share values associated with adverse selection problems, outweigh the reduction in tax liabilities. Nonetheless, risk-averse managers are less likely to undertake risky tax avoidance activities. The above argument leads to our first hypothesis:

H1: Executive cash compensation is negatively related to tax aggressiveness.

To shed more light on the adverse selection costs associated with the investors, we conduct further analysis on the influence of marginal investors on the link between executive cash compensation and tax aggressiveness. As minority ownership is often too diffused to influence firm decisions, we focus on the impact of mutual funds that are often considered as one of the most important group of investors under the institutional environment of Chinese market. For instance, Moore (2012) shows that institutional ownership reduces book-tax differences among US firms. Mutual funds can administer their right either directly by the voice of proxy vote, i.e. activism, or indirectly through "voting with their feet" (Chung and Zhang, 2011; Helwege at al., 2012). Since 2000, Chinese regulators have undertaken substantial efforts to develop financial institutions with the primary intention to improve the efficiency of the listed firms and help stabilize the stock market (Firth et al., 2016). Studies such as Yuan et al. (2008, 2009) and Firth et al. (2016) have provided empirical evidence of the monitoring role of mutual funds but also suggest that Chinese mutual funds tend to focus more on short-term profits such as dividends. Similarly, Chan et al. (2014) show that mutual fund ownership enhances financial reporting quality of Chinese firms. According to Hartzell and Starks (2003), institutional investors may enhance shareholder value through their influence over the executive compensation. Following the same line of logic above, we further conjecture that adverse selection of mutual funds exerts pressure over firms paying high compensation to reduce tax aggressiveness. And, hence, we hypothesize that:

H2: The interaction between executive cash compensation and mutual fund shareholding is negatively associated with tax aggressiveness.

Finally, we shift our attention to the influence of debt on the link between executive cash compensation and tax aggressiveness. Kabir et al. (2013) and Hasan et al. (2014) document that tax-aggressive firms are subject to adverse selection, where, the managers may reduce tax aggressiveness under the monitoring pressure from the creditors. In addition, Lim (2011, 2012), Lin et al. (2014), and Richardson et al. (2014) find a negative relationship between tax aggressiveness and the level of debt suggesting a substitution effect of tax aggressiveness for debt financing. Graham and Tucker (2006) gather a sample of 44 tax shelter cases in the US and find that these firms use less debt when they engage in tax sheltering. Minhat and Dzolkarnaini (2016) document similar empirical evidence in the UK on the substitutability of executive compensation and firm's debt/lease financing using a sample of large British firms. This further indicates a possible link between compensation and tax aggressiveness due to the substitutional effect of tax avoidance on debt (Lim, 2011, 2012; Lin et al., 2014; Richardson et al., 2014). As pointed out by Lin et al. (2014), however, for the most profitable firms, debt and tax aggressiveness are complementary to each other. This complementary effect is also grounded in Duru et al. (2005, 2012) indicating that earnings-based cash bonus is negatively related to both the use of debt and the cost of debt.

Given the above and, particularly, that we have hypothesized a negative association between cash compensation and tax aggressiveness, we expect a positive statistical relation between the level of debt and tax aggressiveness. The economic intuition behind is related to the Chinese institutional environment. The argument regarding creditor adverse selection and the reduced tax aggressiveness relies on the effectiveness of the monitoring role of the debt-holders. According to the extant literature, bank monitoring on their clients listed on the stock market is generally very limited in China (Liu and Tian, 2012; Qian and Yeung, 2015). Despite the fact that bank loans are the main source of debt financing for listed firms in China, the banking system is dominated by low efficiency banks whose credit allocation decisions are under strong influence of the government policies (Berger et al., 2009; García-Herrero et al. ,2009). Qian and Yeung (2015) suggest that easier access to bank loans by state-associated Chinese listed firms leads to the tunneling behavior of controlling shareholders. Moreover, Liu and Tian (2012) find that excess leverage is used for tunneling, instead of capital investment, among Chinese listed private firms. These studies demonstrate that bank inefficiency can reduce the disciplinary power of equity capital market. In light of the extensive literature on the expropriation of minority shareholders by

the controlling shareholder in China (Jiang et al., 2010; Qian and Yueng, 2015), we hypothesize that:

H3: The interaction between executive cash compensation and financial leverage is positively associated with tax aggressiveness.

3. Data and methodology

3.1 Tax aggressiveness measure

Extensive literature has used book-tax differences (BTDs), broadly defined as the differences between the income figures announced to the capital market and that reported to the tax authorities, as an indicator of firm tax aggressiveness/avoidance (e.g. Desai and Dharmapala, 2006, 2009; Frank et al. 2009; Wilson, 2009; Chan et al. 2010; Kim et al., 2011; Tang and Firth, 2011, 2012; Armstrong et al. 2012; Wahad and Holland, 2015; Tang, 2015). In particular, Wilson (2009) and Graham and Tucker (2006) on the US firms, and Tang and Firth (2011, 2012) on the Chinese firms show that firms using greater extent of tax shelters are more profitable and have larger BTDs. There are generally two different measures of BTDs, with one capturing the income effect and the other, the tax effect. The common method adopted in the US-based studies is to estimate the income-effect BTD either by taking the difference between book income and taxable income that is estimated by grossing-up current tax expenses, or by using the effective tax rate reconciliation to infer total BTDs (see Tang and Firth, 2011 for a review). Tang and Firth (2011, 2012) propose the measure of tax-effect BTDs by utilizing a manually collected dataset of 525 firm-year observations over 1999-2004 period with detailed tax reconciliation information provided in the notes to the published financial statements. According to Tang and Firth (2011,2012), the tax-effect BTD measure is particularly appropriate for the Chinese context because it provides a more precise measure than the income-effect BTD where firms are subject to varying tax rates due to differential government tax incentives and where separate tax reporting is required.[2] Similarly, Wahab and Holland (2015) use tax reconciliations for 798 firm-year observations of UK firms to obtain total BTD values. Richardson et al. (2013) use tax avoidance

[2] See Tang and Firth (2011) for an example of how to compute tax-effect BTDs and income-effect BTDs and the different results of those computations.

activities reported in the annual reports of 203 Australian firms as a direct measure of tax aggressiveness.

Tang and Firth (2011, 2012) focus on merely the B-share firms in China because the information on tax reconciliations of A-share firms were not disclosed for their sample period. And, hence, A-share firms, which account for more than 95% of Chinese listed companies, are left unexplored. More recently, the 2006 version of Accounting Standards for Business Enterprises (ASBE)[3] , in particular, ASBE18 Income Taxes, provides guidelines for the voluntary disclosure of reconciliation between the actual tax expenses in the income statement and the notional tax expenses calculated as the product of the pre-tax accounting profit and the applicable tax rate. This reconciliation effectively provides a breakdown of the major sources of a firm's BTDs. Under ASBE 18 Income Taxes, BTDs arise principally as a result of the following common categories: (1) income not taxable; (2) non-deductible expenses for tax purposes; (3) the effects arising from differences in effective tax rate of subsidiaries, particularly those operating in foreign jurisdictions; (4) and prior year's adjustments to tax payable. We manually collected the reported value under all these categories from the notes to the financial statements in the annual reports for all A-share firms, and specifically, from the relevant tax reconciliation information for the financial years 2006-2012. Appendix A shows an example of the tax reconciliation information extracted from a company's annual report.

(Insert Table 1 here)

Table 1 lists the BTD categories along with their corresponding drivers/accounts of the mechanical differences according to the Chinese GAAP and tax law. For each driver, we have identified the proxy accounting variables for further empirical analysis.[4] The sum of all the BTD categories is considered as total BTD. Due to changes of the tax regulation over the sample period, all total BTD values are rescaled by dividing their respective statutory corporate tax rate for each

[3] Available in Chinese at http://www.casc.gov.cn/kjfg/200607/t20060703_337130.htm.

[4] For example, income not taxable is listed as a category of BTD. According to Article 26 of The Enterprise Income Tax Law, equity investment income such as dividend income and bonuses are not taxed. Therefore it is considered as a driver for this BTD category. Chinese listed firms do not disclose dividend income separately, but it is conflated with investment income. Hence, investment income is used as a proxy for the non-taxable income.

firm-year observation for consistent comparisons.[5] BTDs may arise from three sources: earning management, tax avoidance and mechanical differences due to the divergence between GAAP and tax laws, (Tang and Firth, 2011, 2012; and Tang, 2015). The literature to date has made various attempts to adjust BTDs, in order to better capture the empirical contents of tax avoidance. For instance, studies such as Desai and Dharmapala (2006, 2009), Frank et al. (2009), and Wilson (2009) on US firms, and Tang and Firth (2011, 2012) on Chinese firms have attempted to use a residual approach via decomposing BTDs into 'normal' BTDs and 'abnormal' BTDs.[6] Following these prior studies, we measure tax aggressiveness, denoted as TAXAGG, by eliminating the mechanical differences from the total BTD to derive the "abnormal BTD" component,. TAXAGG is estimated from the fixed-effects regression model below:

$$\mathrm{BTD_{it}} = \alpha_i + \beta_1 \mathrm{INVINC_{it}} + \beta_2 \mathrm{INTINC_{it}} + \beta_3 \mathrm{OPEXP_{it}} + \beta_4 FSALE_{it} + \beta_5 \mathrm{LOG(ASSETS_{it})} + \beta_6 \mathrm{OPBIT_{it}} + \beta_7 \mathrm{PBT_{it}} + \beta_8 \mathrm{PBT_{it-1}} + \beta_9 \mathrm{PBT_{it-2}} + \tau_t + \varepsilon_{it}$$

--- Equation (1)

In Equation (1), the dependent variable is total BTD, and the independent variables are the proxies for BTD drivers listed in Table 1 including current period investment income $\mathrm{INVINC_{it}}$, interest income $\mathrm{INTINC_{it}}$, operating expenses $\mathrm{OPEXP_{it}}$, the percentage of overseas sales $FSALE_{it}$, the log of total assets $\mathrm{LOG(ASSETS)_{it}}$, operating profit before interest and tax $\mathrm{OPBIT_{it}}$, net profit before tax $\mathrm{PBT_{it}}$, and the net profit before tax in previous periods $\mathrm{PBT_{it-1}}$ and $\mathrm{PBT_{it-2}}$. As also indicated in Table 1, we use fixed firm effects α_i and year effects τ_t to control for unobservable influences on BTDs including industrial membership, geographical tax policy differences, and time variations in tax regulations and enforcement. We scale all continuous variables in the model except $\mathrm{LOG(ASSETS)_{it}}$ and $FSALE_{it}$ by prior year-end total assets and winsorize them at 1% and 99% to run the regression. We then use the regression error ε_{it} as our tax aggressiveness measure denoted as $TAXAGG_{it}$, calculated as the actual total BTD value minus the fitted BTD value from the Equation (1) regression.

[5] The Enterprise Income Tax Law, enacted in March 2007 and in force since January 2008 homogenized (gradually) the corporate income tax rate for both foreign-investment enterprises and domestic enterprises to 25%, while prior to this EIT Law, foreign-invested enterprises had benefitted from a lower tax rate of 15% and domestic enterprises had paid 33%. Unreported results suggest that using unadjusted total BTDs in our analysis does not affect our key findings.

[6] Similarly, Tang (2015) regress total BTD on discretionary accruals and the difference between the statutory tax rate and the effective tax rate, and their interaction term to measure the mandatory book-tax conformity.

As robustness checks, we have also used an alternative measure to estimate BTD so as to derive the tax aggressiveness measure. Tang and Firth (2011, 2012) and Tang (2015) illustrate that abnormal book-tax differences (ABTD) reflect the opportunistic differences due to aggressive tax management and book income reporting, and this is particularly well suited for measuring tax aggressiveness for Chinese firms. ABTD would rise with the occurrence of income and tax manipulation activities. A positive ABTD is considered as a result of current earnings and/or tax-related cash flows being overstated. In contrast, firms are presumed to have manipulated their taxable income upward (smoothing taxes) or/and to have managed their earnings downward (smoothing earnings), leading to a negative ABTD (lower ABTD). Correspondingly, a negative ABTD is a result of understated current earnings and/or tax-related cash flows. Our BTD drivers and proxies adhere closely to the ABSE (2006). We the BTD model in Tang and Firth (2011, 2012) as follows to derive the alternative tax aggressiveness measure:

$$BTD_{it} = \beta_0 + \beta_1 \Delta INV_{it} + \beta_2 \Delta REV_{it} + \beta_3 NOL_{it} + \beta_4 TLU_{it} + \beta_5 TAX_DIFF_{it} + \gamma IND_i + \delta YEAR_t + \varepsilon_{it}$$

--- Equation (2)

In Equation (2), the drivers of mechanical differences in BTDs are change in fixed assets investment ΔINV_{it}, change in revenues ΔREV_{it}, the value of operating losses NOL_{it}, the value of tax loss utilized TLU_{it}, the difference between the consolidated company's applicable tax rate and the average tax rate in the consolidated group account TAX_DIFF_{it}. We further control for industry and year fixed effects by including industry dummies IND_i and year dummies $YEAR_t$. All continuous variables expect TAX_DIFF_{it} are scaled by prior year-end total assets and then winsorized at 1% and 99% to run the regression. We use the regression error ε_{it} as our alternative measure of tax aggressiveness, denoted as TF_AGG_{it}. See Appendix B1 for BTD models as in Equations (1) and (2).

3.2 Sample and models

We screen the annual reports of all A-share listed firms during the 2006-2012 period for tax reconciliation information disclosed in the notes to the financial statements. Financial sector firms are excluded due to the different nature of their assets and liabilities. Our efforts result in a hand-collected dataset of 958 firm-year observations compiled from tax reconciliations of 217 Chinese listed firms for our sample period. For financial year 2006, we have used the restated accounting values complying with the 2006 Accounting Standards for Business Enterprises

(ASBE, 2006) to ensure consistency in the analysis. Our sample size is about twice as big as that of Tang and Firth (2011, 2012) and is significantly larger than Wahab and Holland (2015) which utilize tax reconciliations of UK listed firms and Richardson et al. (2013) that use directly identified tax avoidance activities of Australian firms. Table 2 shows the distribution of our sample by year and by CSRC industry classifications.

(Insert Table 2 here)

We collect the financial data and corporate governance information from China Stock Market and Accounting Research database (CSMAR). In light of previous work by Firth et al. (2006, 2007), Chen et al. (2011), Conyon and He (2011), and Huang and Boateng (2017), we use the sum of cash compensation to the top 3 executives EXEPAY as our main cash compensation variable. We've also collected the top 3 directors (including executive directors) and denote this variable as DIRPAY. Additionally, we've collected the sum of cash compensation to all executives, directors, and supervisors and the total number of executives, directors, and supervisors and calculate our third measure of compensation as the average per person compensation to executives, directors, and supervisors, denoted as EDSPAY. We adopt DIRPAY and EDSPAY in addition to EXEPAY in our empirical tests as robustness checks. Consistently, Armstrong et al. (2012) have examined CEO, CFO, and tax directors' compensations and tax aggressiveness among US firms. The rationale behind this is the consideration of the two-tier board system in China. In particular, former government officials and managers with political connections are often appointed as executives and directors of Chinese listed firms which increases the chance of director-executive coalition (Firth et al., 2006; Ding et al., 2010; Pan and Tian, 2017). These compensation variables are winsorized at 1% and 99% to mitigate the influence of outliers. We calculate the log values of these compensation variables due to their log-normal distributions. In summary, the cash compensation measures used in the empirical analysis are LOG(EXEPAY), LOG(DIRPAY), and LOG(EDSPAY).

Alternatively, excess cash compensation is estimated, on the basis of the cash compensation measures derived above, as robustness checks. Prior literature has been examining executive compensation and performance through the lens of managerial power. Management theory defines managerial power as the ability of executives to influence pay decisions made by the board of directors which facilitates executives to pursue their self-interest (Chen et al., 2011). Typically, this literature adopts a regression based approach to estimate the excess compensation.

According to Core et al. (1999), Brick et al. (2006), and Chung et al. (2015), the predicted component of managerial compensation arises from the characteristics of board and ownership structure in addition to the factors such as firm size and performance. As for Chinese firms, Huang and Boateng (2017) document a positive association between executive/director compensation (or excess compensation) and firm level information asymmetry. Following this recent work, we adopt a model with fixed firm α_i and fixed year τ_t effects to estimate the expected cash compensation based on the following factors: proxies for managerial structural power in determining their compensations - the equity shareholdings of respective executives, directors, and supervisors (Shareholding) and board independence (BOARDIND); Tobin's Q ratio (Tobin's Q) as a proxy for firm growth opportunities; return on equity (ROE) also included as profitability is associated with pay reward; and firm size measured by the log of market capitalization LOGMC.

$$\text{Log}(PAY_{it}) = \alpha_i + \beta_1 * Shareholding_{it} + \beta_2 * LOG(Tobin's\ Q)_{it} + \beta_3 * ROE_{it} + \beta_4 * LOGMC_{it} + \beta_5 * BOARDIND_{it} + \tau_t + \varepsilon_{it}$$

--- Equation (3)

In Equation (3), PAY_{it} refers to the cash compensation variables EXEPAY, DIRPAY, and EDSPAY. The excess cash compensation is the prediction error ε_{it} from the above model calculated as the difference between actual pay (in log form) minus the expected pay from the model predictions. These are denoted as EXCESS LOG(EXEPAY), EXCESS LOG(DIRPAY), and EXCESS LOG(EDSPAY). [7] See Appendix B2 for the compensation model predictions as in Equation (3).

To test our hypotheses, we follow Tang and Firth (2011, 2012), Wahab and Holland (2015), and Richardson et al. (2013) by adopting a Pooled OLS regression model as follows:

$$TAXAGG_{it}\ or\ TF_AGG_{it} = \alpha + \beta_1 LOG(PAY)_{it-1}\ or\ \beta_1 EXCESS\ LOG(PAY)_{it-1} + \gamma Controls_{it-1} + \gamma IND_i + \tau YEAR_t + \varepsilon_{it}$$

--- Equation (4)

[7] We use all firm-year observations of non-financial and non-distress firms (distress firms are denoted as ST/*ST) to estimate the predicted cash compensation in Equation (3). The R-squared of the prediction regressions are 46.6%, 36.1%, and 50.5% for executive cash compensation (EXEPAY), director cash compensation (DIRPAY), and average per person leadership cash compensation (EDSPAY), respectively.

The dependent variables are our tax aggressiveness measures $TAXAGG_{it}$ and TF_AGG_{it}. The main independent variables in the model are the log of (excess) executive and director cash compensation LOG(EXEPAY), LOG(DIRPAY), LOG(EDSPAY), or EXCESS LOG(EXEPAY), EXCESS LOG(DIRPAY), EXCESS LOG(EDSPAY). We control for fixed industry and year effects by including the groups of industry dummies based on CSRC industry classifications IND_i and year dummies $YEAR_t$.[8] Coefficient α is the intercept and ε_{it} is the regression error. We calculate robust t-statistics for model coefficients based on standard errors clustered by firm and year. $Controls_{it}$ represent a number of control variables. First, we controls for board composition, board effectiveness, and auditor quality as these can influence the managerial resource diversions and rent seeking activities through tax avoidance (Desai and Dharmapala, 2006, 2009; Richardson et al., 2013; Armstrong et al., 2015). Specifically, the control variables we include in our main regressions are the percentage of independent directors (BOARDIND), the number of directors (BOARDSIZE), the number of board meetings in a year (BOARDMEET), the CEO duality dummy (CEOD), the "Big-4" auditor dummy (BIG4AUDIT) and auditor opinion dummy (AUDITOP). Second, we add controls for firm ownership due to potential effects of the Chinese institutional environment documented by Sun and Tong (2003) and Jiang et al. (2010). These are state-shares percentage (STASH), government associated firm controlling shareholder dummy (GOVCON), and mutual funds shareholding percentage (FUNDSH).[9] Third, we control for financial leverage (LEVERAGE) considering the impact of debt-holder monitoring (Kabir et al., 2013; and Hasan et al., 2014), since leverage is known to facilitate tunnelling (Liu and Tian, 2012; Qian and Yeung, 2015), and the potential "substitution effect" or "complementary effect" of debt for tax aggressiveness (Lim, 2011, 2012; Lin et al., 2014; and Richardson et al., 2014). Fourth, we include control variables for earnings management measured by the discretionary accruals scaled by total assets (DACC) (Dechow and Dichev, 2002) due to its positive effect on BTDs documented by Tang and Firth (2011). We further include the return on equity (ROE) and a dummy variable

[8] In all regressions we have controlled for the fixed industry and fixed year effects, omitted variables, particularly these are "fixed for given industry across years" and "fixed for given year across firms" are therefore controlled.

[9] Chinese listed firms issue multiple classes of shares. Shares traded on stock exchanges are A-shares and B-shares. Non-tradable shares are classified as state-shares and legal person shares. The state, its agency, and SOEs control the majority of the listed firms.

for net profit (LOSS). Finally, common control variables are included, i.e., firm size measured as the log of market capitalization (LOGMC), and growth opportunity measured as the book-to-price ratio (BOOK/PRICE). To mitigate the problems of endogeneity, all independent variables, except for the dummy variables, are lagged by 1 year. For robustness checks, to simultaneously account for the endogeneity of compensation, tax aggressiveness, ownership and control, leverage, and corporate governance, we further include the lagged dependent variable Lag_1.TAXAGG and Lag_1.TF_AGG on the right hand side of Equation (4) and use the two-step Arellano and Bover (1995)/Blundell and Bond (1998) dynamic panel-data system estimator with Windmeijer (2005) bias-corrected robust standard errors for estimation. Appendix C provides more detailed descriptions of all variables. Table 3 summarizes our variables. All non-dummy variables are winsorized at 1% and 99% to mitigate the effects of outliers.

(Insert Table 3 here)

4. Results

4.1 Baseline regression results

Regressions in Tables 4 and 5 follow Equation (4) to test H1. The dependent variable is TAXAGG in Table 4 estimated from Equation (1), and TF_AGG in Table 5 estimated using Tang and Firth (2011, 2012) model from Equation (2). Irrespective of which tax aggressiveness measure is used, we can conclude from both tables that (excess) cash compensation is negatively and significantly related to tax aggressiveness, thereby supporting H1. Our finding here contributes significantly to a body of literature based on primarily US observations where equity incentive compensation is widely used for improving the alignment of interests between shareholders and managers (Minnick and Noga, 2010; Armstrong et al., 2012, 2015; and Rego and Wilson, 2012). In China, however, executive compensation is primarily paid in cash, managers tend to focus more on short-term objectives, therefore are less inclined to engage in tax aggressiveness which have been found to be beneficial to firm values in the long-run but detrimental in the short-term (Healy, 1985; Minnick and Noga, 2010; and Duru et al., 2005, 2012). This is because cash compensation is often subject to stricter market scrutiny than incentive compensation, i.e. the pressure of adverse selection in the equity and debt market. (Hasan et al., 2014; Chung et al., 2015).

We also notice that, among the control variables, BIG4AUDIT is positively related to tax aggressiveness. While this does not indicate audit quality reduces tax aggressiveness, it may

suggest that firms that are more tax aggressive use "Big-4" accounting firms as their auditors to improve external monitoring and avoid investor adverse selection. Mutual fund shareholding (FUNDSH) reduces tax aggressiveness and financial leverage (LEVERAGE) increases tax aggressiveness. These results are in line with hypotheses H2 and H3 which will be further explored later. Earnings management (DACC) is positively associated with tax aggressiveness as expected according to Tang and Firth (2011). Loss-making firms are less aggressive with tax avoidance as their need for tax sheltering is genuinely low. We also find that state-shares percentage (STASH) and government control (GOVCON) are positively related to tax aggressiveness suggesting weak internal governance and strong political connection tend to facilitate tax aggressiveness. These results are in line with Kim and Zhang (2016) which show that politically connected firms are more tax aggressive due to lower detection risk, better access to inside information regarding future changes in tax regulation and enforcement, lower capital market pressure for transparency, lower political costs associated with aggressive tax planning, and higher risk-taking tendencies.

(Insert Table 4 here)

Table 4 results also reveal that firm size measured by LOGMC only weakly affects tax aggressiveness in models 1-3 using the log of cash compensation as dependent variables, and does not affect tax aggressiveness in models 4-6 using the excess of log compensation as dependent variables. This suggests that firm size influences tax aggressiveness through its association with executive cash compensation. We conduct an additional test by repeating the regressions in Tables 4 and 5 after incorporating an interaction term of cash compensation and firm size. The negative link between compensation and tax aggressiveness remains robust after controlling for this interaction. The interaction itself, although statistically significant, has very small economic impact on the dependent variable given the coefficients. The results of these additional tests are reported in Appendix B3.[10]

(Insert Table 5 here)

[10] We thank our reviewer for an excellent suggestions here. Further tests on subsamples classified by the median size value of the sample reveal that the negative compensation-tax aggressiveness relationship still holds among larger firms although weaker compared to the effect among smaller firms. Regression results on the subsamples are consistent with those on the full sample, as reported in Appendix B3, and, hence, are not reported in the paper to conserve space.

The above findings support the conjecture that firms paying higher compensation are under greater external pressure to reduce tax aggressiveness, especially when their internal governance mechanisms are ineffective. We now explore two possible channels through which the external monitoring agents may influence the relationship between cash compensation and tax aggressiveness. These two external monitoring agents are mutual funds and creditors. In Table 6, we report regressions with interactions between excess cash compensation and mutual funds shareholding added into Equation (4). Two measures are used to capture the extent of mutual funds' influence over firms' tax aggressiveness. Panel A reports the results where we use a dummy variable, high mutual funds (HFUNDSH), which equals to 1 if the percentage shareholding by mutual funds (FUNDSH) is above the median and 0 if it is below. Panel B reports the results where the percentage of mutual funds shareholdings (FUNDSH) is used. Results reported in both panels suggest that the interaction is negative and significant with either measure of mutual funds shareholdings, thereby strongly support H2. This result is consistent with Moore (2012) which finds a negative association between mutual funds ownership and book-tax differences among US firms. We conclude that under the presence of managerial power, measured by excess cash compensation, mutual funds shareholding mitigate the risk of firms' tax aggressiveness by restraining high-power managers' investment in tax avoidance. This finding indicates that firms paying higher excess cash compensations are under the market pressure to reduce tax aggressiveness to avoid adverse selection by mutual fund investors.[11] It also supports the view that mutual funds in China pursue more short-term objectives compared to those in the Western developed markets and have started to pay an important governance role after major regulatory efforts (Firth et al., 2016).

(Insert Table 6 here)

Last but not least, in Table 7 we explore the potential influence of financial leverage on the relation between cash compensation and tax aggressiveness. A similar adjustment to Equation (4) is made by including interactions between (excess) cash compensation and a high leverage dummy (HLEV), which equals to 1 if the market value based financial leverage ratio is above the median

[11] Unreported tests suggest that the interactions between cash compensation and mutual funds shareholding are insignificant determinants of tax aggressiveness suggesting mutual funds exert stronger monitoring pressure on the basis of excess compensation that is not due to firm performance but a reflection of agency costs and managerial power.

and 0 if it is below. Both results reported in Panel A, regressing with cash compensation, and Panel B, regressing with excess cash compensation, show that these interactions are positively and significantly associated with tax aggressiveness thus strongly support H3. Nonetheless, the coefficients on (excess) cash compensation variables remain negative and significant. In each of these models, the sum of the coefficients on the interaction and (excess) cash compensation is close to zero suggesting that high leverage offsets the negative link between cash compensation and tax aggressiveness. HLEV is positively and significantly related to tax aggressiveness in all regressions. Our findings here support the conjectured complementary relationship between the use of debt and tax aggressiveness to shelter tax burdens (Duru et al., 2005, 2012). In addition, they are in line with the argument made by Liu and Tian (2012) and Qian and Yeung (2015) that high leverage facilitates tunneling behavior of the controlling shareholders, which has been found as a particularly prominent phenomenon in China. In developed financial markets, creditors are expected to restrict firms' tax aggressiveness (Lim, 2011; 2012; Kabir et al., 2013; Hasan et al., 2014; Lin et al., 2014; Richardson et al., 2014). Under the unique institutional setting of the Chinese market, however, it appears that easy access to debt or high level of debt facilitates tax aggressiveness by providing more flexibility and resources at the managerial discretion to engage in risky tax avoidance activities.[12]

(Insert Table 7 here)

4.2 Dynamic panel data models using system GMM estimator

We conduct a further robustness test in this section to simultaneously account for the endogeneity of compensation, tax aggressiveness, ownership and control, leverage, and corporate governance. We use the two-step Arellano and Bover (1995)/Blundell and Bond (1998) dynamic panel-data system estimator with Windmeijer (2005) bias-corrected robust standard errors in the models. Results are reported in Table 8. In particular, we add a lagged dependent variable Lag_1.TAXAGG and Lag_1.TF_AGG to the right hand side of Equation (4). All other independent variables in our model are considered endogenous and industry/year effects are

[12] Unreported tests on subsamples classified by the median leverage ratio and the median mutual fund shareholdings ratio show that the negative compensation-tax aggressiveness relationship still holds among high leverage firms, but not among low mutual fund shareholding firms. These results are again largely consistent with the results on the full sample, as reported in tables 6&7.

dropped due to the dynamic nature of the model. In these GMM models, past period information has been controlled for using the lagged dependent variable, and the coefficients on the remaining determinants indicate the marginal influence of "new" contemporaneous information. For model estimation, we take the first-difference of all the variables, estimate the model by generalized method of moments (GMM) and use lagged values of executive cash compensation and other firm characteristics as instruments.

(Insert Table 8 here)

Results in Table 8 appear to be consistent with those reported in Tables 4-7 and are in line with our hypotheses H1, H2, and H3. Executive cash compensation is negatively and significantly associated with tax aggressiveness in all 6 models. The interaction between compensation and the percentage of mutual fund shareholding LOG(EXEPAY)*FUNDSH is negatively and significantly related to tax aggressiveness in models 2 and 5. The interaction between compensation and the percentage of financial leverage LOG(EXEPAY)*LEVERAGE is positively and significantly related to tax aggressiveness in models 3 and 6. We also test for second order serial correlations AR(2) and run the Sargan test of overidentifying restrictions, and results support the validity of our model and the GMM instruments. Moreover, in models 2/3/5/6, we have also included interactions between executive cash compensation and dummy variables HFUND and HLEV in addition to the interaction between compensation and the percentages of fund shareholding FUNDSH and leverage LEVERAGE. We find that the interaction between compensation, the percentages of fund shareholding and leverage dominate the interactions with dummies in a "horse race". This model specification shows a weak threshold impact of fund shareholding using the HFUND dummy in addition to the percentage variable FUNDSH. Similar threshold impact of the HLEV dummy appears to be statistically insignificant. Taken together, these results indicate that while H2 and H3 are supported (with regard to the direction of impact given the coefficients on the percentage variables), tax aggressiveness is less sensitive to changes of mutual fund shareholding (and leverage to less extent) for firms with above-median percentage of mutual fund shareholding (and above-median level of leverage).[13]

[13] For example in model 2, the influence of executive cash compensation on tax aggressiveness is LOG(EXEPAY)*(-0.362-1.559*FUNDSH+0.438*HFUND). When HFUND equals to 1, the sensitivity of tax aggressiveness to LOG(EXEPAY) is higher (while negative) and depends on FUNDSH.

5. Conclusion

Tax plays an important role in both public policies and corporate decisions. Much has been learned over the past decade on the determinants of firm tax avoidance activities and the economic consequences of tax avoidance under the agency theory framework (Chen and Chu, 2005; Crocker and Slemrod, 2005; Desai and Dharmapala, 2006, 2009; Hanlon and Slemrod, 2009; Minnick and Noga, 2010; Kim et al., 2011; Rego and Wilson, 2012; Armstrong et al., 2015). The extant literature suggests that managerial equity-based incentive compensation encourages managers to invest in aggressive tax avoidance activities (Minnick and Noga, 2010; Armstrong et al., 2012, 2015; Rego and Wilson, 2012). In contrast, the association between cash-based compensation, including mainly salaries and bonuses, and tax aggresiveness is understudied. To fill this research gap, this paper utilizes the Chinese setting where executives and directors of the listed companies are paid primarily in cash with very limited use of equity incentives (Firth et al., 2006, 2007; Chen et al., 2011; Conyon and He, 2011). We find that firms paying higher executive cash compensation, or higher excess cash compensation, are associated with lower tax aggressiveness. Mutual funds ownership strengthens the negative link between excess cash compensation and tax aggressiveness indicating the monitoring role of mutual funds pressures firms that pay high compensation to reduce tax aggressiveness to avoid investor adverse selection and share price discounts. Consistent with the prior evidence that high leverage facilitates the tunnelling behaviour of the controlling shareholders in China, we document that high leverage offsets the negative link between cash compensation and tax aggressiveness suggesting that financial leverage and tax aggressiveness are complementary to each other under the weak creditor protection environment in China. Our findings shed light on the influence of broader corporate governance environment in China's transition economy on tax aggressiveness and significantly extend the prior studies conducted mainly on the US firms featured with rather different agency conflicts (Sun and Tong, 2003; Jiang et al., 2010). Corporate executive compensation designs in many emerging markets around the world share similar features as Chinese firms due to their similar ownership structure and agency relationships (La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002; Lins, 2003). Our research therefore has potential common implications for many regions outside of the US and calls for future studies in international settings.

References:

Arellano M, Bover O (1995) Another look at the instrumental variable estimation of error-components models. Journal of Econometrics 68: 29–51.

Armstrong CS, Blouin JL, Larcker DF (2012) The incentives for tax planning. Journal of Accounting and Economics 53: 391–411.

Armstrong CS, Blouin JL, Jagolinzer AD, Larcker DF (2015) Corporate governance, incentives, and tax avoidance. Journal of Accounting and Economics 60: 1–17.

Berger A, Hasan I, Zhou M (2009) Bank ownership and efficiency in China: What will happen in the world's largest nation? Journal of Banking and Finance 33: 113–130.

Blundell R, Bond S (1998) Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87: 115–143.

Brick IE, Palmon O, Wald JK (2006) CEO compensation, director compensation, and firm performance: Evidence of cronyism? Journal of Banking and Finance 12: 403-426.

Cai H, Liu Q (2009) Competition and tax avoidance: evidence from Chinese industrial firms. Economic Journal 119(537): 764–795.

Chan K, Chow L (1997) An empirical study of tax audits in China on international transfer pricing. Journal of Accounting and Economics 23(1): 83-112.

Cang Y, Chu Y, Lin TW (2014) An exploratory study of earnings management detectability, analyst coverage and the impact of IFRS adoption: Evidence from China. Journal of Accounting and Public Policy 33(4): 356-371.

Chan AL, Ding R, Hou W (2014) Does mutual fund ownership affect financial reporting quality for Chinese privately-owned enterprises? International Review of Financial Analysis 36: 131-140.

Chan KH, Lin K, Mo PLL (2010) Will a departure from tax-based accounting encourage tax noncompliance? Archival evidence from a transition economy. Journal of Accounting and Economics 50**:** 58-73.

Chen H, Dong W, Han H, Zhou N (2016) A comprehensive and quantitative internal control index: construction, validation, and impact. Review of Quantitative Finance and Accounting forthcoming DOI: 10.1007/s11156-016-0593-x.

Chen J, Ezzamel M, Cai Z (2011) Managerial power theory, tournament theory, and executive pay in China. Journal of Corporate Finance 17: 1176-1199.

Chen KP, Chu CYC (2005) Internal control versus external manipulation: a model of corporate income tax evasion. The RAND Journal of Economics 36: 151–164.

Chen S, Chen X, Cheng Q, Shevlin T (2010) Are family firms more tax aggressive than non-family firms? Journal of Financial Economics 95(1): 41–61.

Chien C, Lee CF, She CC (2016) Does corporate governance curb managers' opportunistic behavior of exploiting inside information for early exercise of executive stock options? Review of Pacific Basin Financial Markets and Policies. DOI: 10.1142/S0219091516500065.

Chung H, Judge WQ, Li YH (2015) Voluntary disclosure, excess executive compensation and firm value. Journal of Corporate Finance 32: 64-90.

Chung KH, Zhang H (2011) Corporate governance and institutional ownership. Journal of Financial and Quantitative Analysis 46(1): 247-273.

Claessens S, Djankov S, Lang L (2000) The separation of ownership and control in East Asian corporations. Journal of Financial Economics 58(1): 81–112.

Cohen DA, Dey A, Lys TZ (2009) The Sarbanes Oxley Act of 2002: Implications for Compensation Contracts and Managerial Risk Taking, Working paper.

Conyon MJ, He L (2011) Executive compensation and corporate governance in China. Journal of Corporate Finance 17: 1158-1175.
Core JE, Holthausen RW, Lacker DF (1999) Corporate governance, chief executive officer compensation and firm performance. Journal of Financial Economics 51: 371-406.
Crocker KJ, Slemrod J (2005) Corporate tax evasion with agency costs. Journal of Public Economics 89: 1593–1610.
Dechow P, Dichev ID (2002) The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review 77: 35–59.
Desai M, Dharmapala D (2006) Corporate tax avoidance and high-powered incentives. Journal of Financial Economics 79: 145–179.
Desai M, Dharmapala D (2009) Corporate tax avoidance and firm value. Review of Economics and Statistics 91: 537–546.
Ding S, Wu Z, Li Y, Jia C (2010) Executive compensation, supervisory board, and China's governance reform: a legal approach perspective. Review of Quantitative Finance and Accounting 35(4): 445-471.
Duru A, Mansi S, Reeb D (2005) Earnings-based bonus plans and the agency cost of debt. Journal of Accounting and Public Policy 24: 431–447.
Duru A, Iyengar RJ, Zampelli EM (2012) Performance choice, executive bonuses and corporate leverage. Journal of Corporate Finance 18: 1286-1305.
Faccio M, Lang L (2002) The ultimate ownership of Western European corporations. Journal of Financial Economics 65(3): 365–95.
Firth M, Fung PMY, Rui OM (2006) Corporate performance and CEO compensation in China. Journal of Corporate Finance 12: 693-714.
Firth M, Fung P, Rui O (2007) How ownership and corporate governance influence chief executive pay in China's listed firms. Journal of Business Research 60: 776-785.
Firth M, Gao J, Shen JH, and Zhang YY (2016) Institutional stock ownership and firms' cash dividend policies: Evidence from China. Journal of Banking and Finance 65: 91-107.
Frank MM, Lynch LJ, Rego SO (2009) Tax reporting aggressiveness and its relation to aggressive financial reporting. The Accounting Review 84: 1-47.
García-Herrero A, Gavilá S, Santabárbara D (2009) What explains the low profitability of Chinese banks? Journal of Banking and Finance 33: 2080–2092.
Graham J, Tucker A (2006) Tax shelters and corporate debt policy. Journal of financial economics 118: 107-155.
Guo J (2016) Ultimate controlling shareholders and dividend payout policy in Chinese stock market. Review of Pacific Basin Financial Markets and Policies 19(2), forthcoming Doi: 10.1142/S0219091516500089.
Hanlon M, Slemrod J (2009) What does tax aggressive signal? Evidence from stock price reaction to news about tax aggressiveness. Journal of Public Economics 93: 126-141.
Hartzell JC, Starks LT (2003) Institutional investors and executive compensation. Journal of Finance 58(6): 2351-2374.
Hasan I, Hoi CK, Wu Q, Zhang H (2014) Beauty is in the eye of the beholder: The effect of corporate tax avoidance on the cost of bank loans. Journal of Financial Economics 113: 109–130.
Healy P (1985) The Effect of Bonus Schemes on Accounting Decisions. Journal of Accounting and Economics 7: 85-107.

Helwege J, Intintoli VJ, Zhang A (2012) Voting with their feet or activism? Institutional investors' impact on CEO turnover. Journal of Corporate Finance 18(1): 22-37.
Hou Q, Jin Q, Wang (2014) Mandatory IFRS adoption and executive compensation: Evidence from China. China Journal of Accounting Research 7(1): 9-29.
Houqe MN, Monem RM (2016) IFRS Adoption, Extent of Disclosure, and Perceived Corruption: A Cross-Country Study. The International Journal of Accounting 51(3): 363-378.
Huang W (2016) Tunneling through related-party loan guarantees: evidence from a quasi-experiment in China. Review of Quantitative Finance and Accounting 47(3): 857-884.
Huang W, Boateng A (2017) Executive and board shareholding, compensation, and analyst forecast of Chinese firms. Applied Economics 49(15): 1459-1472.
Hung M, Wong TJ, Zhang F (2015) The value of political ties versus market credibility: evidence from corporate scandals in China. Contemporary Accounting Research 32(4): 1641–1675.
Jensen M, Meckling W (1976) Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3(4): 305–360.
Jensen MC, Murphy KJ (1990) Performance pay and top-management incentives. Journal of Political Economy 98: 225-264.
Ji X, Lu W, Qu W (2017) Voluntary disclosure of internal control weakness and earnings quality: evidence from China. The International Journal of Accounting 52(1): 27–44.
Jiang G, Lee C, Yue, H (2010) Tunneling through inter-corporate loans: the China experience. Journal of Financial Economics 98: 1-20.
Kabir R, Li H, Veld-Merkoulova YV (2013) Executive compensation and the cost of debt. Journal of Banking and Finance 37: 2893-2907.
Kim C, Zhang L (2016) Corporate Political Connections and Tax Aggressiveness. Contemporary Accounting Research 33(1): 78-114.
Kim J, Li Y, Zhang L (2011) Corporate tax avoidance and stock price crash risk: Firm-level analysis. Journal of Financial Economics 100: 639–662.
La Porta R., Lopez-de-Silanes F, Shleifer A (1999) Corporate ownership around the world. Journal of Finance 54(2): 471–516.
Lambert R, Larcker D (1987) An analysis of the use of accounting and market measures of performance in executive compensation contracts. Journal of Accounting Research 25: 85–125.
Leone AJ, Wu JS, Zimmerman JL (2006) Asymmetric sensitivity of CEO cash compensation to stock returns. Journal of Accounting and Economics 42: 167–192.
Lim Y (2011) Tax avoidance, cost of debt and shareholder activism: Evidence from Korea. Journal of Banking and Finance 35: 456–470.
Lim Y (2012) Tax avoidance and underleverage puzzle: Korean evidence. Review of Quantitative Finance and Accounting 39(3): 333-360.
Lin S, Tong N, Tucker AL (2014) Corporate tax aggression and debt. Journal of Banking and Finance 40: 227-241.
Lins K (2003) Equity ownership and firm value in emerging markets. Journal of Financial and Quantitative Analysis 38:159–184.
Liu Q, Tian G (2012) Controlling shareholder, expropriations and firm's leverage decision: Evidence from Chinese Non-tradable share reform. Journal of Corporate Finance 18: 782–803.
Minhat M, Dzolkarnaini N (2016) Is executive compensation a substitute governance mechanism to debt financing and leasing? Applied Economics 48(14): 1293-1302.

Minnick K, Noga T (2010) Do corporate governance characteristics influence tax management? Journal of Corporate Finance 16: 703-718.
Moore JA (2012) Empirical evidence on the impact of external monitoring on book–tax differences. Advances in Accounting 28: 254-269.
Pan X, Tian G (2017) Political connections and corporate investments: Evidence from the recent anti-corruption campaign in China. Journal of Banking and Finance forthcoming Doi:10.1016/j.jbankfin.2017.03.005
Peng S, Smith JVDL (2010) Chinese GAAP and IFRS: An analysis of the convergence process. Journal of International Accounting, Auditing and Taxation 19(1): 16–34.
Phillips J (2003) Corporate tax planning effectiveness: The role of compensation-based incentives. The Accounting Review 78**:** 847-874.
Qian M, Yeung B (2015) Bank financing and corporate governance. Journal of Corporate Finance 32: 258-270.
Rego SO, Wilson R (2012) Equity risk incentives and corporate tax aggressiveness. Journal of Accounting Research 50: 775–810.
Richardson G, Taylor G, Lanis R (2013) The impact of board of director oversight characteristics on corporate tax aggressiveness: An empirical analysis. Journal of Accounting and Public Policy 32: 68-88.
Richardson G, Lanis R, Leung SC (2014) Corporate tax aggressiveness, outside directors, and debt policy: An empirical analysis. Journal of Corporate Finance 25: 107–121.
U.S. Congress (2002) The Sarbanes-Oxley Act of 2002. Public Law No.107-204. Government Printing Office, Washington, D.C.
Shevlin T (2007) The future of tax research: from accounting professor's perspective. The Journal of American Taxation Association 29: 87-93.
Shleifer A, Vishny R (1993) Corruption. The Quarterly Journal of Economics 108 (3): 599–617.
Sun Q, Tong WHS (2003) China share issue privatization: the extent of its success. Journal of Financial Economics 70: 183-222.
Tang YH (2015) Does book-tax conformity deter opportunistic book and tax reporting? An international analysis. European Accounting Review 24 (3): 441-469.
Tang YH, Firth M (2011) Can book-tax difference capture earnings management and tax management? Empirical evidence from China. The International Journal of Accounting 46**:** 175-204.
Tang YH, Firth M (2012) Earnings persistence and stock market reactions to the different information in book-tax differences: Evidence from China. The International Journal of Accounting 47**:** 369-397.
Wahab NSA, Holland K (2015) The persistence of book-tax differences. The British Accounting Review forthcoming 47 (4): 339-350.
Windmeijer F (2005) A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126: 25–51.
Wilson R (2009) An examination of corporate tax shelter participants. The Accounting Review 84**:** 969-999.
Yuan R, Xiao JZ, Zou H (2008) Mutual funds' ownership and firm performance: Evidence from China. Journal of Banking and Finance 32: 1552–1565.
Yuan R, Xiao JZ, Milonas N, Zou JH (2009) The role of financial institutions in the corporate governance of listed Chinese companies. British Journal of Management 20(4): 562–580.

Table 1: Hypothesized drivers of BTDs

	Category of BTD	Hypothesized Drivers of Category	Proxy variables
1	Income not taxable	Investment income and Finance income	$INVINC_{it}$ (Investment income) $INTINC_{it}$ (Interest income)
2	Expenses not deductible	Industry membership; operating expenses.	Fixed-effects α_i (Fixed firm effects) $OPEXP_{it}$ (Operating expenses)
3	The effect of the application of a different tax rate to income, either because it is generated abroad or because it is subject to a different domestic tax rate	Profit before exceptional items; total assets; geographical location.	$FSALE_{it}$ (The percentage of sales from overseas) $LOG(ASSETS_{it})$ (The log of total assets) $OPBIT_{it}$ (Operating profit before interest and tax) τ_t (Fixed year effects)
4	Prior year adjustments	Prior two years' lagged pre-tax profit.	PBT_{it-1} (1-year lagged pre-tax profit) PBT_{it-2} (2-year lagged pre-tax profit)
5	Utilization of brought-forward tax losses (Recognition of previous unrecognized losses)	Current period pre-tax profit and two lags of pre-tax profit.	PBT_{it} (Pre-tax profit) PBT_{it-1} $PBIT_{it-2}$
6	Current period tax losses carried forward (Current period unrecognized losses)	Current period pre-tax profit and two lags of pre-tax profit.	PBT_{it} PBT_{it-1} $PBIT_{it-2}$
7	Taxation of capital gains and losses	Accounting gains on sale of fixed assets	N/A
8	Other permanent differences	Unobservable fixed firm and year effects	Fixed-effects α_i (Fixed firm effects) τ_t (Fixed year effects)

Table 2: Sample distribution by year and industry

2006	87
2007	97
2008	138
2009	156
2010	175
2011	178
2012	127
2006-2012	958
Mining	53
Manufacturing	450
Utilities	62
Construction	27
Transportation and warehousing	120
Information technology	50
Wholesale and retail trade	30
Real estate	96
Social service	39
Communication and cultural industries	14
Conglomerates	17
Total	958

Table 3: Summary of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
TAXAGG	958	0.01	0.80	-2.70	2.08
TF_AGG	958	0.01	0.75	-2.65	2.02
EXEPAY	952	2186639	1875059	237788	11500000
DIRPAY	952	2188442	1873954	244110	11500000
EDSPAY	953	6430822	6411402	460772	39700000
LOG(EXEPAY)	952	6.34	6.27	5.38	7.06
LOG(DIRPAY)	952	6.34	6.27	5.39	7.06
LOG(EDSPAY)	953	6.81	6.81	5.66	7.60
EXCESS LOG(EXEPAY)	942	0.04	0.28	-0.66	0.70
EXCESS LOG(DIRPAY)	909	0.03	0.33	-0.89	0.80
EXCESS LOG(EDSPAY)	943	0.03	0.27	-0.67	0.66
BOARDIND	950	0.37	0.06	0.27	0.60
BOARDSIZE	950	9.98	2.22	6.00	15.00
BOARDMEET	957	10.07	4.66	4.00	29.46
CEOD	943	0.93	0.26	0.00	1.00
BIG4AUDIT	958	0.57	0.50	0.00	1.00
AUDITOP	958	0.97	0.17	0.00	1.00
LEVERAGE	958	0.35	0.21	0.03	0.81
DACC	934	0.10	6.61	-19.22	20.65
ROE	949	0.09	0.11	-0.46	0.37
LOGMC	953	10.02	0.58	8.83	11.79
BOOK/PRICE	957	0.79	0.28	0.18	1.38
LOSS	958	0.07	0.26	0.00	1.00
STASH	958	0.19	0.24	0.00	0.77
GOVCON	917	0.85	0.36	0.00	1.00
FUNDSH	933	0.12	0.15	0.00	0.58

All continuous variables winsorized at 1% and 99%. See Appendix C for variable definitions.

Table 4: Executive and director cash compensations and firm tax aggressiveness (TAXAGG)

Model	(1)	(2)	(3)	(4)	(5)	(6)
LOG(EXEPAY)	-0.294***					
	(-3.39)					
LOG(DIRPAY)		-0.264***				
		(-3.24)				
LOG(EDSPAY)			-0.292***			
			(-3.21)			
EXCESS LOG(EXEPAY)				-0.223**		
				(-2.17)		
EXCESS LOG(DIRPAY)					-0.230**	
					(-2.57)	
EXCESS LOG(EDSPAY)						-0.268***
						(-2.70)
BOARDIND	-0.586	-0.702	-0.592	-0.566	-0.523	-0.575
	(-1.20)	(-1.40)	(-1.21)	(-1.27)	(-1.15)	(-1.29)
BOARDSIZE	0.023*	0.021	0.018	0.018	0.016	0.015
	(1.73)	(1.50)	(1.43)	(1.43)	(1.25)	(1.26)
BOARDMEET	0.006	0.005	0.005	0.004	0.004	0.004
	(1.09)	(0.81)	(0.94)	(0.91)	(0.74)	(0.86)
CEOD	-0.019	-0.027	-0.027	-0.009	-0.022	-0.017
	(-0.16)	(-0.22)	(-0.22)	(-0.08)	(-0.17)	(-0.14)
BIG4AUDIT	0.211***	0.203***	0.217***	0.207***	0.200***	0.210***
	(3.49)	(3.23)	(3.58)	(3.43)	(3.19)	(3.50)
AUDITOP	-0.137	-0.155	-0.155	-0.207	-0.210	-0.203
	(-0.66)	(-0.73)	(-0.74)	(-1.05)	(-1.05)	(-1.03)
STASH	0.275*	0.254*	0.283*	0.291**	0.267*	0.291**
	(1.84)	(1.67)	(1.91)	(1.98)	(1.79)	(1.99)
GOVCON	0.138*	0.121	0.137*	0.180**	0.164*	0.175**
	(1.69)	(1.41)	(1.67)	(2.18)	(1.89)	(2.12)
FUNDSH	-0.449**	-0.445**	-0.428*	-0.559***	-0.551**	-0.550***
	(-2.05)	(-1.98)	(-1.95)	(-2.68)	(-2.57)	(-2.64)
LOGMC	0.111*	0.102*	0.090*	-0.061	-0.057	-0.057
	(1.95)	(1.83)	(1.68)	(-1.56)	(-1.43)	(-1.48)
LEVERAGE	0.950***	0.966***	0.993***	1.048***	1.058***	1.075***
	(4.99)	(4.95)	(5.25)	(5.79)	(5.72)	(5.96)
BOOK/PRICE	0.195	0.250	0.186	0.202	0.228	0.187
	(1.11)	(1.33)	(1.06)	(1.27)	(1.36)	(1.18)
DACC	0.842*	0.828*	0.860*	0.704	0.694	0.708
	(1.85)	(1.76)	(1.89)	(1.55)	(1.49)	(1.57)
ROE	-0.986*	-0.955	-0.967*	0.144*	0.145*	0.146*
	(-1.72)	(-1.63)	(-1.68)	(1.73)	(1.77)	(1.76)
LOSS	-0.510***	-0.479***	-0.504***	-0.191	-0.166	-0.193
	(-2.99)	(-2.68)	(-2.97)	(-1.40)	(-1.17)	(-1.43)
Observations	865	833	866	865	833	866
R-squared	0.263	0.260	0.262	0.253	0.252	0.255

Notes: All models are OLS regressions controlling for industry and year fixed-effects. The dependent variable in all regressions is tax aggressiveness TAXAGG. The numbers in parentheses are robust t-statistics for regression coefficients with firm-level clustered standard errors. To reduce the endogeneity problem, all the continuous independent variables are lagged by 1 year. See Appendix C for variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Executive and director cash compensations and firm tax aggressiveness (TF_AGG)

Model	(1)	(2)	(3)	(4)	(5)	(6)
LOG(EXEPAY)	-0.247***					
	(-2.90)					
LOG(DIRPAY)		-0.235***				
		(-2.86)				
LOG(EDSPAY)			-0.256***			
			(-2.85)			
EXCESS LOG(EXEPAY)				-0.209**		
				(-2.02)		
EXCESS LOG(DIRPAY)					-0.229**	
					(-2.50)	
EXCESS LOG(EDSPAY)						-0.262***
						(-2.62)
Observations	867	835	868	867	835	868
R-squared	0.232	0.232	0.232	0.214	0.216	0.217

Notes: All models are OLS regressions controlling for industry and year fixed-effects. The dependent variable in all regressions is tax aggressiveness TF_AGG. The numbers in parentheses are robust t-statistics for regression coefficients with firm-level clustered standard errors. To reduce the endogeneity problem, all the continuous independent variables are lagged by 1 year. Other control variables follow models in Tables 4. See Appendix C for variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Mutual funds, excess executive and director compensation, and tax aggressiveness

Panel A: The influence of high mutual funds shareholding (HFUNDSH)						
Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TAXAGG	TAXAGG	TF_AGG	TF_AGG	TF_AGG
EXCESS LOG(EXEPAY)*HFUNDSH	-0.333*			-0.474**		
	(-1.75)			(-2.53)		
EXCESS LOG(DIRPAY)*HFUNDSH		-0.373**			-0.458***	
		(-2.23)			(-2.70)	
EXCESS LOG(EDSPAY)*HFUNDSH			-0.322*			-0.430**
			(-1.74)			(-2.35)
EXCESS LOG(EXEPAY)	-0.061			0.032		
	(-0.40)			(0.22)		
EXCESS LOG(DIRPAY)		-0.040			0.007	
		(-0.29)			(0.05)	
EXCESS LOG(EDSPAY)			-0.081			-0.017
			(-0.53)			(-0.11)
HFUNDSH	-0.047	-0.053	-0.053	-0.082	-0.088	-0.088
	(-0.83)	(-0.91)	(-0.95)	(-1.49)	(-1.57)	(-1.64)
Observations	865	833	866	867	835	868
R-squared	0.218	0.219	0.219	0.185	0.189	0.186
Panel B: The influence of mutual funds % shareholding (FUNDSH)						
Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TAXAGG	TAXAGG	TF_AGG	TF_AGG	TF_AGG
EXCESS LOG(EXEPAY)*FUNDSH	-1.746**			-2.170***		
	(-2.53)			(-3.06)		
EXCESS LOG(DIRPAY)*FUNDSH		-1.472**			-1.647**	
		(-2.37)			(-2.52)	
EXCESS LOG(EDSPAY)*FUNDSH			-1.335*			-1.703**
			(-1.89)			(-2.35)
EXCESS LOG(EXEPAY)	-0.003			0.064		
	(-0.03)			(0.50)		
EXCESS LOG(DIRPAY)		-0.039			-0.017	
		(-0.33)			(-0.15)	
EXCESS LOG(EDSPAY)			-0.073			-0.023
			(-0.55)			(-0.18)
FUNDSH	-0.461**	-0.476**	-0.490**	-0.540**	-0.559**	-0.572**
	(-2.08)	(-2.13)	(-2.21)	(-2.42)	(-2.49)	(-2.57)
Observations	865	833	866	867	835	868
R-squared	0.230	0.229	0.227	0.201	0.200	0.198

Notes: All models are OLS regressions controlling for industry and year fixed-effects. The dependent variable for Panels A and B regressions is tax aggressiveness TAXAGG, and for Panels C and D regressions is TF_AGG. The numbers in parentheses are robust t-statistics for regression coefficients with firm-level clustered standard errors. To reduce the endogeneity problem, all the continuous independent variables are lagged by 1 year. *FUNDSH* is the percentage of shares held by mutual funds. *HFUNDSH* is a dummy which equals to 1 if the percentage of fund shareholding (FUNDSH) is above its median value, or 0 if otherwise. Other control variables follow models in Tables 4 and 5. See Appendix C for variable definitions. Other control variables follow models in Tables 4 and 5. See Appendix C for variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: The influence of leverage on the compensation and tax aggressiveness relationship

Panel A: Executive and director compensation						
Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TAXAGG	TAXAGG	TF_AGG	TF_AGG	TF_AGG
LOG(EXEPAY)*HLEV	0.534***			0.506***		
	(4.57)			(4.29)		
LOG(DIRPAY)*HLEV		0.478***			0.480***	
		(4.75)			(4.80)	
LOG(EDSPAY)*HLEV			0.564***			0.548***
			(4.95)			(4.82)
LOG(EXEPAY)	-0.449***			-0.392***		
	(-4.97)			(-4.51)		
LOG(DIRPAY)		-0.437***			-0.408***	
		(-4.84)			(-4.54)	
LOG(EDSPAY)			-0.482***			-0.441***
			(-4.96)			(-4.69)
HLEV	0.025***	0.608***	0.699***	0.867***	0.634***	0.629***
	(4.13)	(4.23)	(4.39)	(3.87)	(4.30)	(4.28)
Observations	865	833	866	867	835	868
R-squared	0.273	0.270	0.272	0.246	0.248	0.247
Panel B: Excess executive and director compensation						
Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TAXAGG	TAXAGG	TF_AGG	TF_AGG	TF_AGG
EXCESS LOG(EXEPAY)*HLEV	0.377**			0.292		
	(1.98)			(1.52)		
EXCESS LOG(DIRPAY)*HLEV		0.393**			0.374**	
		(2.38)			(2.24)	
EXCESS LOG(EDSPAY)*HLEV			0.373**			0.353**
			(2.07)			(1.99)
EXCESS LOG(EXEPAY)	-0.384***			-0.343**		
	(-2.75)			(-2.40)		
EXCESS LOG(DIRPAY)		-0.414***			-0.412***	
		(-3.12)			(-2.98)	
EXCESS LOG(EDSPAY)			-0.425***			-0.428***
			(-3.19)			(-3.04)
HLEV	0.294***	0.303***	0.305***	0.302***	0.319***	0.310***
	(5.34)	(5.33)	(5.61)	(4.55)	(4.69)	(4.70)
Observations	865	833	866	867	835	868
R-squared	0.247	0.248	0.249	0.214	0.219	0.218

Notes: All models are OLS regressions controlling for industry and year fixed-effects. The dependent variable for Panels A and B regressions is tax aggressiveness TAXAGG, and for Panels C and D regressions is TF_AGG. The numbers in parentheses are robust t-statistics for regression coefficients with firm-level clustered standard errors. To reduce the endogeneity problem, all the continuous independent variables are lagged by 1 year. HLEV is a dummy which equals to 1 if the leverage ratio (LEVERAGE) is above its median value, or 0 if otherwise. Other control variables follow models in Tables 4 and 5. Other control variables follow models in Tables 4 and 5. See Appendix C for variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Dynamic panel data models using system GMM estimator

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TAXAGG	TAXAGG	TF_AGG	TF_AGG	TF_AGG
Lag_1.TAXAGG	0.249***	0.246***	0.234***			
	(6.72)	(6.93)	(6.54)			
Lag_1.TF_AGG				0.195***	0.201***	0.173***
				(5.98)	(6.35)	(5.49)
LOG(EXEPAY)	-0.282**	-0.362**	-0.870***	-0.342**	-0.400**	-1.075***
	(-2.16)	(-2.23)	(-3.80)	(-2.54)	(-2.38)	(-4.58)
LOG(EXEPAY)*HFUND		0.438**			0.433*	
		(2.00)			(1.90)	
LOG(EXEPAY)*FUNDSH		-1.559**			-1.607**	
		(-1.97)			(-1.99)	
LOG(EXEPAY)*HLEV			-0.457			-0.561*
			(-1.57)			(-1.88)
LOG(EXEPAY)*LEVERAGE			1.996***			2.581***
			(2.93)			(3.68)
HFUND		-2.752**			-2.737*	
		(-1.99)			(-1.90)	
FUNDSH	-0.327	9.548*	-0.403	-0.452	9.741	-0.556**
	(-1.18)	(1.65)	(-1.55)	(-1.58)	(1.63)	(-2.08)
HLEV			3.060*			3.769**
			(1.66)			(1.99)
LEVERAGE	0.981***	0.996***	-11.951***	0.904***	0.958***	-15.803***
	(3.76)	(4.08)	(-2.75)	(3.40)	(3.82)	(-3.54)
BOARDIND	1.829**	1.829***	1.631**	1.735**	1.748**	1.608**
	(2.41)	(2.61)	(2.37)	(2.25)	(2.44)	(2.30)
BOARDSIZE	0.037	0.049**	0.026	0.031	0.041*	0.018
	(1.61)	(2.33)	(1.21)	(1.28)	(1.91)	(0.82)
BOARDMEET	0.002	-0.003	0.005	0.003	-0.004	0.006
	(0.19)	(-0.46)	(0.73)	(0.33)	(-0.51)	(0.81)
CEOD	0.099	0.008	0.081	0.059	-0.015	0.052
	(0.68)	(0.06)	(0.62)	(0.39)	(-0.10)	(0.38)
BIG4AUDIT	0.066	0.069	0.089	0.028	0.040	0.074
	(0.59)	(0.66)	(0.83)	(0.25)	(0.38)	(0.69)
AUDITOP	-0.554**	-0.535**	-0.376*	-0.519**	-0.500**	-0.330
	(-2.54)	(-2.52)	(-1.81)	(-2.31)	(-2.28)	(-1.55)
STASH	0.346**	0.318**	0.343**	0.342**	0.345**	0.368***
	(2.35)	(2.27)	(2.48)	(2.28)	(2.40)	(2.59)
GOVCON	-0.051	-0.040	-0.128	-0.105	-0.130	-0.174
	(-0.30)	(-0.26)	(-0.81)	(-0.61)	(-0.82)	(-1.08)
LOGMC	0.196**	0.199**	0.251***	0.234***	0.225**	0.291***
	(2.23)	(2.32)	(2.98)	(2.59)	(2.56)	(3.36)
BOOK/PRICE	-0.309*	-0.292*	-0.341**	-0.229	-0.251	-0.290*
	(-1.75)	(-1.77)	(-2.04)	(-1.27)	(-1.47)	(-1.69)
DACC	-0.138	-0.210	-0.144	0.032	0.041	0.013
	(-0.29)	(-0.49)	(-0.33)	(0.07)	(0.09)	(0.03)
ROE	-0.364	-0.420	-0.535	-0.600	-0.703	-0.811*
	(-0.80)	(-1.00)	(-1.26)	(-1.26)	(-1.59)	(-1.83)
LOSS	-0.417***	-0.425***	-0.358***	-0.297**	-0.322**	-0.246*

	(-3.04)	(-3.29)	(-2.73)	(-2.07)	(-2.38)	(-1.81)
Constant	-0.863	-0.419	2.391*	-0.708	-0.237	3.416**
	(-0.89)	(-0.37)	(1.67)	(-0.71)	(-0.20)	(2.34)
Observations	660	660	660	661	661	661
Number of firms	190	190	190	191	191	191
AR(2)	0.17	0.16	0.17	0.22	0.23	0.22
Sargan	0.08	0.09	0.08	0.11	0.12	0.11

Notes: We use the two-step Arellano and Bover (1995)/Blundell and Bond (1998) dynamic panel-data system estimator with Windmeijer (2005) bias-corrected robust standard errors in models 1-6. All independent variables are considered as endogenous variables. We control for the first lag of the dependent variables Lag_1.TAXAGG and Lag_1.TF_AGG in these models to mitigate second order serial correlations. We conduct second order serial correlations AR(2) test and Sargan test of overidentifying restrictions. All regressions include a constant. See Appendix C for detailed variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Appendix A: 000022: Shenzhen CHIWAN WHARF HOLDINGS LIMITED 2012 annual reports

Income tax expenses (in RMB):

Item	2012	2011
Current tax expenses	133,843,163	155,728,890
Deferred tax expenses	(8,718,115)	(7,167,257)
Total	125,125,048	148,561,633

Reconciliation of income tax expenses to the accounting profit is as follows (in RMB):

Item	2012	2011
Accounting profit	740,894,558	816,337,301
Income tax expenses calculated at 25% (the prior year: 24 %)	185,223,640	195,920,952
Effect of expenses that are not deductible for tax purposes	3,715,114	2,746,526
Effect of tax-free income	(20,879,728)	(28,374,764)
Effect of unrecognized deductible losses and deductible temporary differences for tax purposes	957,342	1,003,459
Changes in opening balances of deferred tax assets/liabilities due to the adjustment in tax rate		2,290,517
Effect of different tax rates of subsidiaries operating in other jurisdictions	(302,040)	(244,303)
Effect of tax preference policy	(50,664,660)	(30,256,021)
Withholding tax	7,075,380	5,475,267
Income tax expense	125,125,048	148,561,633

Note: The tax-effect BTDs can be calculated in two ways. Firstly, employing *prima racie* income tax expenses minus current tax expenses, in this case, it is calculated as follows: for the 2012, 185,223,640-133,843,163+8,718,115-=60098592. Secondly, it is the sum of the temporary and permanent differences, in this case, it is the sum of the row 4 to row 10 in reconciliation of income tax expenses, that is -(3,715,114-20,879,728+957,342-302,040-50,664,660+7,075,380)=60098592.

Appendix B1: The Book-Tax Difference (BTD) models

Our Model – Equation (1)	
Dependent Variables	BTD_{it}
$OPEXP_{it}$	0.000
	(0.32)
$OPBIT_{it}$	-0.091***
	(-4.90)
PBT_{it}	0.171***
	(8.71)
PBT_{it-1}	-0.017***
	(-3.10)
PBT_{it-2}	-0.020***
	(2.75)
$INVINC_{it}$	0.064***
	(3.38)
$LOG(ASSETS)_{it}$	0.000***
	(4.08)
$INTINC_{it}$	-0.165
	(-1.64)
$FSALE_{it}$	0.000
	(1.38)
Intercept	0.002*
	(1.74)
Year dummies	controlled
Industry dummies	controlled
Observations	958
R-square	0.449

Tang and Firth (2011) and Tang (2015) Model - Equation (2)	
Dependent Variables	BTD_{it}
ΔINV_{it}	0.002
	(1.16)
ΔREV_{it}	0.000
	(0.75)
NOL_{it}	1.011***
	(14.07)
TLU_{it}	0.854***
	(8.18)
TAX_DIFF_{it}	0.004***
	(2.95)
Year dummies	controlled
Industry dummies	controlled
Observations	962
R-square	0.401

Notes: The dependent variable is total BTD calculated using manually collected BTD categories. These BTD models (1) and (2) control for the drivers of mechanical differences in BTDs. In Equation (1), the independent variables on the right hand are the proxies for BTD drivers listed in Table 1 including current period investment income $INVINC_{it}$, interest income $INTINC_{it}$, operating expenses $OPEXP_{it}$, the percentage of overseas sales $FSALE_{it}$, the log of total assets $LOG(ASSETS)_{it}$, operating profit before interest and tax $OPBIT_{it}$, net profit before tax PBT_{it}, and the net profit before tax in previous periods PBT_{it-1} and PBT_{it-2}. In Equation (2), the independent variables are change in fixed assets investment ΔINV_{it}, change in revenue ΔREV_{it}, the value of operating losses NOL_{it}, the value of tax loss utilized TLU_{it}, the difference between the consolidated company's applicable tax rate and the average tax rate in the consolidated group TAX_DIFF_{it}. See Section 3.1 for detailed discussions.

Appendix B2: The executive compensation model predictions

Model	(1)	(2)	(3)
Dep. Var.	LOG(EXEPAY)	LOG(DIRPAY)	LOG(EDSPAY)
EXE.Shareholding	0.270**		
	(2.41)		
DIR.Shareholding		0.629***	
		(3.60)	
EDS.Shareholding			0.536***
			(3.49)
LOG(Tobin'Q)	-0.221***	-0.281***	-0.336***
	(-8.24)	(-7.74)	(-11.99)
ROE	0.445***	0.498***	0.368***
	(7.30)	(6.74)	(6.38)
LOGMC	0.286***	0.337***	0.362***
	(12.98)	(11.53)	(15.87)
BOARDIND	0.228	-0.559***	-0.123
	(1.46)	(-2.71)	(-0.77)
Constant	11.062***	10.819***	11.567***
	(66.81)	(50.22)	(66.48)
Firm fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	11,420	11,403	11,585
R-squared	0.466	0.361	0.505
# Firms	2,392	2,386	2,393

Notes: We use all A-share listed non-financial sector firms during the years 2006-2012 to estimate the predicted cash compensation in Equation (3) of section 3.2. All 3 regressions control for fixed firm and fixed year effects. t-statistics are based on robust standard errors. *** p<0.01, ** p<0.05, * p<0.1.

Appendix B3: The influence of firm size on the compensation and tax aggressiveness relationship

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	TAXAGG	TF_AGG	TAXAGG	TF_AGG	TAXAGG	TF_AGG
LOG(EXEPAY)	-0.594***	-0.527***				
	(-6.17)	(-5.02)				
LOG(DIRPAY)			-0.632***	-0.575***		
			(-6.31)	(-5.20)		
LOG(EDSPAY)					-0.710***	-0.637***
					(-6.38)	(-5.23)
LOG(EXEPAY)*LOGMC	0.051***	0.044***				
	(4.65)	(3.88)				
LOG(DIRPAY)*LOGMC			0.052***	0.045***		
			(4.94)	(4.09)		
LOG(EDSPAY)*LOGMC					0.059***	0.051***
					(5.15)	(4.26)
LOGMC	-0.050	-0.040	-0.035	-0.014	-0.042	-0.030
	(-0.72)	(-0.54)	(-0.56)	(-0.21)	(-0.70)	(-0.47)
Other firm level controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	865	867	833	835	866	868
R-squared	0.281	0.227	0.280	0.228	0.282	0.228

Notes: All models are OLS regressions controlling for industry and year fixed-effects. The numbers in parentheses are robust t-statistics for regression coefficients with firm-level clustered standard errors. To reduce the endogeneity problem, all the continuous independent variables are lagged by 1 year. Other control variables follow models in Tables 4 and 5. Other control variables follow models in Tables 4 and 5. See Appendix C for variable definitions. *** p<0.01, ** p<0.05, * p<0.1.

Appendix C: Variable Definitions

TAXAGG is the measure of the tax aggressiveness, which is the prediction error from our BTD model.
TF_AGG is the measure of tax aggressiveness for Chinese firms following the BTD model specification in Tang and Firth (2011, 2012).
EXEPAY is the top three executives' cash compensation, which is the total pay of the top three officers, defined as the sum of basic salary and bonus excluding allowance.
DIRPAY is the top three directors' cash compensation including basic salary and bonus excluding allowance.
EDSPAY is the average per person cash compensation paid to board of directors, supervisors, and executives.
LOG(EXEPAY) is the log of the top three executives' cash compensation.
LOG(DIRPAY) is the log of the top three directors' cash compensation.
LOG(EDSPAY) is the log of the average per person cash compensation to directors, supervisors, and executives.
EXCESS LOG(EXEPAY) is the excess cash compensation for top 3 executives calculated as the prediction error of an executive compensation model.
EXCESS LOG(DIRPAY) is the excessive cash compensation for top 3 directors calculated as the prediction error of an director compensation model.
EXCESS LOG(EDSPAY) is the average per person excessive cash compensation for directors, supervisors, and executives calculated as the prediction error of their corresponding per person compensation model.
BOARDIND is the percentage of board members that are independent.
BOARDSIZE is the size of the board as the number of directors.
BOARDMEET is the total number of board meetings in a year.
CEOD is a dummy which equals to 1 if the chair of the board and the CEO are the same person and 0 if they are two persons.
BIG4AUDIT is a dummy which equals to 1 if the firm's auditor is one of the "Big-4" accounting firms.
AUDITOP is a dummy which equals to 1 if the auditor opinion is standard or 0 if it is non-standard.
LEVERAGE is the market value financial leverage ratio which equals to the book value of debt divided by the total of market capitalization and book value of debt.
HLEV is a dummy which equals to 1 if the leverage ratio is above its median value, or 0 if otherwise.
DACC is the value of discretionary accruals measured as the prediction error when regressing total accruals against change in sales, fixed assets, and industry and year fixed effects.
ROE is the return on equity.
LOGMC is the log of firm market capitalization.
BOOK/PRICE the book-to-price ratio.
LOSS is a dummy which is equal to 1 if the firm's net income before extraordinary items is negative, or 0 if otherwise.
STASH is the total percentage of shares that are classified as state-shares and state-legal person shares.
GOVCON is a dummy which equals to 1 if the firm controlling shareholder is government or government agency and 0 if it is a private investor.
FUNDSH is the percentage of shares held by mutual funds.
HFUNDSH is a dummy which equals to 1 if the percentage of fund shareholding (FUNDSH) is above its median value, or 0 if otherwise.