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The Quality of Tax Accounting for Financial Reporting Purposes - International Evidence from the United Kingdom

Abstract: The quality of tax accounting can be defined as the relationship between the annual tax expense reported in firms' financial statements and future tax cashflows. As corporate income taxes have a material proportion of earnings, assessing the tax accounting quality can help financial statement users in evaluating future commitment to internal funds. While there is an emerging US-based literature on tax accounting quality, to the authors' knowledge this is the first study to examine tax accounting quality in a domestic standard setting outside of the US and the first under a regime governed by International Financial Reporting Standards.

Results of this study indicate that tax accounting quality is significantly lower for firms that engage in higher levels of tax management or have stronger earnings management pressure. While corporate governance mechanisms do not moderate the relationship between tax management and tax accounting quality, there is some evidence of a moderating effect in the relationship between earnings management pressure and tax accounting quality. In addition, we observe variations in tax accounting quality associated with a change in tax-related financial reporting standards.

Keywords: Tax Accounting Quality; Corporate Tax Management; Earnings Management; Corporate Governance

1. Introduction

Tax accounting and in particular the estimation of the corporate income tax expense (tax expense) is an important input in how investors forecast firms' future tax cash flows (Ciconte et al., 2013; Brouwer & Naarding, 2018). Against a backdrop of tax expense materiality and estimation uncertainty, previous research has examined tax accounting quality by measuring the degree to which the estimated tax expense maps on to future tax cash flows. The stronger the relationship, the higher the representativeness or quality of tax accounting (Robinson et al., 2016; Choudhary et al., 2016; Choudhary et al., 2021).

This paper attempts two contributions to the literature. Firstly, we extend the extant US-based literature by examining a non-US Generally Accepted Accounting Principles (GAAP)

setting. Even where there are broad similarities in the legal systems and capital markets of countries, caution should be exercised in applying existing findings in other national settings. Specifically, we examine tax accounting in the United Kingdom. Secondly, we augment existing studies of tax accounting quality and tax management by examining earnings management incentives and corporate governance mechanisms.

Significant differences between the UK and US exist in financial reporting requirements and tax disclosure regulations¹, auditing provisions² and arguably in public attitudes to corporate tax management (Oats & Tuck, 2019; Dyreng et al., 2020). More generally, cross-country comparisons are important because of underlying differences in the tax environment between states (Shaw et al., 2008). The UK setting also provides an opportunity to examine three contrasting reporting regimes within a relatively short sample frame (1992 - 2017). The current International Financial Reporting Standards (IFRS)³ regime was preceded by two domestic reporting standards *Statement of Standard Accounting Practice (SSAP) 15* and then *Financial Reporting Standard (FRS) 19*. We can address the question of whether the evolution of financial reporting standards is associated with increased tax accounting quality.

We extend Choudhary et al. (2016) examination of tax accounting quality and tax management by including earnings management and corporate governance considerations.^{4, 5}

¹ Provisions similar to ASC 740-10 (Fin 48) took effect in the UK from January 2019 (IFRIC 23). Highlighting the lack of disclosure in audited financial reports, HMRC is consulting on legislation to require confidential disclosure by firms to HMRC of *uncertain tax treatment* (HMRC, 2021).

² There is no general prohibition of auditor provided tax services in the UK during the period examined. Major revisions to the Financial Reporting Council's Ethical Standards (Financial Reporting Council, 2019) introduced significant prohibitions to auditor provided tax services. These changes took effect from March 2020.

³ IFRS have been adopted in over 144 jurisdictions (IFRS, 2021).

⁴ While we use the terms *tax accounting quality* and *tax accrual quality* interchangeable, in explaining the methodology we use the more precise term *tax accrual quality*.

⁵ The term tax management is used to describe any activity that is designed to produce a tax desired outcome. It embraces terms such as tax planning, tax (aggressive) avoidance etc. as these terms lack precise definition. Further, it is not possible to accurately measure any such sub-categorizations using only publicly available information.

⁶ Increased levels of tax management may increase the level of uncertainty over future tax cash flows resulting in a lowering of tax accounting quality (Choudhary et al., 2016). The origins of this uncertainty lie in attempting to apply complex legislation to complex business structures (Lev et al., 2010). Uncertainty or tax risk can be magnified by firms attempting to reduce or manage their tax liability (Dyrenge et al., 2019) and in response, tax administrations attempting to maintain compliance within the "spirit of the law" (HM Revenue & Customs, 2020a). Higher earnings management pressure may induce management bias in reporting (Dhaliwal et al., 2004; Holland & Jackson, 2004) with a resulting lowering of tax accounting quality. The complexity external users face in interpreting tax disclosures (Plumlee, 2003; Edgley & Holland, 2020; Francis et al., 2019; Blankespoor et al., 2020) can act to facilitate management bias. Further, the tendency of managers to restrict tax disclosures to reduce the likelihood of inadvertently aiding or prompting intervention by a tax administration (Balakrishnan et al., 2019) may exacerbate user difficulties.

We examine the role of corporate governance systems in moderating any such influences of tax uncertainty and management bias on tax accounting quality. Investors and regulators anticipate bias in financial reporting. Corporate governance systems are designed to promote higher quality financial reporting and more broadly, an alignment of managers' interests with those of shareholders (Financial Reporting Council, 2018). Effective corporate governance should therefore lead to higher quality tax accounting by simultaneously, reducing the scope and incentive for management bias in reporting, and demanding better assessments of the uncertainties in taxation and underlying financial reporting.

In summary, our results are as follows. We find a negative relationship between tax management and tax accounting quality. Increasing levels of tax management can involve

⁶ The analysis is based on data from a sample of UK firms quoted on the London Stock Exchange (LSE) Main Market during the period 1992 – 2017.

increased tax risk resulting in greater uncertainty in estimating future tax cash outcomes. We find a similar negative relationship between earnings management pressure and tax accounting quality. Increasing pressure to meet an earnings target may result in biased tax accounting leading to lower tax accounting quality. While corporate governance mechanisms do not moderate the relationship between tax management and tax accounting quality, there is some evidence of a moderating effect in the relationship between earnings management pressure and tax accounting quality.⁷ This differential response is consistent with corporate governance only being effective in controlling internal sources of low tax accounting quality, i.e., biased reporting, and being ineffective with external sources, i.e., increased uncertainty. Finally, we observe a reduction in tax accounting quality over time associated with changes in tax-related financial reporting standards. Care should be exercised in interpreting this result as evidence of reduced effectiveness of reporting standards. Within a UK context there is a potential counter effect of increasing tax risk arising from heightened interventions in firms' tax management by the United Kingdom's tax authority HM Revenue & Customs (HMRC, 2021).

The remainder of this study is structured as follows. The next section summarizes the institutional background and development of the hypotheses and is followed by sections on data and methodology, results and robustness checks. The concluding section comprises the discussion and conclusion.

2. Institutional Background and Hypotheses Development

Complexity can contribute to uncertainty and the complexity associated with tax accounting can be illustrated by considering the potential composition of the income tax expense reported in a group's consolidated statement of profit or loss. The reported estimated

⁷ In this study, we use three variables (financial analysts' coverage, the presence of financial expertise on audit committee and percentage of institutional shareholders) to measure corporate governance and find that the moderating effect is only present from financial analysts' coverage.

amount is an amalgamation across all group members of their estimated tax liabilities due to one of potentially several tax jurisdictions generated by current activities and possibly contingent on future events, and where applicable, can also include adjustments to tax expense estimates of prior periods (IASB, 2018).^{8 9}

Official statistics and academic research highlight the complexity and uncertainty facing taxpayers in dealing with tax legislation. Since its first publication in 2010, HMRC's annual tax gap estimates show the two largest contributions to the UK's overall tax gap are "*failure to take reasonable care*" and "*legal interpretation*" (HM Revenue & Customs, 2020a).¹⁰ Managers within companies can struggle to understand the implications of tax legislation across a broad range of corporate aspects (Damodaran et al., 2005; Hanlon & Heitzman, 2010; Armstrong et al., 2015; Doidge & Dyck, 2015). Academic evidence reports investors too have difficulties in understanding tax legislation and its implications for individual firms (Edgeley & Holland, 2020; Holland et al., 2021; Plumlee, 2003; Lev & Nissim, 2004; Seida & Wempe, 2004; Weber, 2009; Doidge & Dyck, 2015; Bonsall et al., 2017).

These observed difficulties can be exacerbated when firms attempt to avoid taxation. Hanlon and Heitzman (2010) describe tax planning as constituting a continuum with the level of "aggressiveness" increasing when moving from, e.g., municipal bond investments at one of the spectrum to tax evasion at the other extreme. In the UK, the term "tax aggressiveness" has no statutory basis and more generally lacks a universally accepted definition (Blouin, 2014; Balakrishnan et al., 2019). Early definitions of aggressiveness focused on motives, e.g., transactions whose main purpose was to lower a firm's tax liability (Slemrod, 2004), while

⁸ While the US tax resident groups of companies can file a single consolidated tax return, in the UK each UK tax resident member of a group must prepare and submit a single entity based tax return.

⁹ The most recent available statistics show that at any one time "around half of the largest (UK tax resident) business are under enquiry, often covering multiple issues and years" (HMRC, 2020b). Enquiries into these larger businesses were on average open for 45 months 2019 – 2020 (Tax Journal, 2021).

¹⁰ HMRC define legal interpretation losses as "where the customer's and HMRC's interpretation of the law and how it applies to the facts in a particular case result in a different tax outcome, and there is no avoidance" (HMRC, 2020a).

more recent definitions focus on consequences. Blouin (2014) argues that tax aggressiveness and tax uncertainty or risk are interrelated; tax management with a high degree of risk represents aggressive tax planning. Tax management outcomes can be uncertain because of the inherent complexity of tax systems (Kim et al., 2011). The level of uncertainty can be aggravated when a specific tax management action is seen as contentious by a tax authority and therefore potentially subject to challenge. Contentious activities can be characterized by attempts to *"exploit the tax rules to gain a tax advantage that Parliament never intended by operating within the letter but not the spirit of the law."* (HM Revenue & Customs, 2020a).

Tax management can also affect tax accounting quality through non-tax costs of tax management. These costs include increased operational and financial complexity required to facilitate a tax outcome (Kim et al., 2011) and increased financial reporting opacity to avoid attracting scrutiny of a tax administration (Frank et al., 2009; Balakrishnan et al., 2019). Increased complexity and opacity can also provide managers with lower risk opportunities for rent diversion (Desai & Dharmapala, 2009).

Our first hypothesis examines the relationship between tax management and tax accounting quality. In the absence of an equivalent provision to FIN 48 in providing a direct measure of tax uncertainty in either UK domestic or IFRS standards, we use firms' effective tax rates (ETRs) as a measure of tax uncertainty (Dyreng et al., 2019). Notwithstanding Blouin (2014), we posit that high (low) levels of ETRs are associated with low (high) levels of tax uncertainty. *Ceteris paribus* firms will first adopt lower risk tax management projects before contemplating riskier options as they attempt to increase the level of tax management (Guenther et al., 2017; Dyreng et al., 2019). Consequently, increased levels of tax management

and higher uncertainty could increase the potential for estimation bias in predicting tax outcomes resulting in lower quality tax accounting.¹¹ Hence, it is hypothesized that:

H1: There is a negative relationship between the level of tax management and the quality of tax accounting to explain future tax cash flows.

The sources of complexity described above coupled with confidentiality surrounding tax decisions can lead to a tax-information asymmetry between managers and financial statement users. A lack of transparency over firms' tax matters can provide managers with the cover to deliberately misstate tax accounting (Desai & Dharmapala, 2006; Kim et al., 2011; Balakrishnan et al., 2019). Dechow and Dichev (2002) argue that firms with incentives to meet earnings targets are potentially under earnings management pressure. Previous research shows that managers may manipulate the income tax account when their pre-tax performance is insufficient to meet earnings targets (Dhaliwal et al., 2004; Holland & Jackson, 2004). As intentional manipulation would result in bias, we predict that the stronger the demand to manage earnings, the less informative will be the tax accounting about future tax cashflows. Hence, it is hypothesized that:

H2: There is a negative relationship between the demand for earnings management and the quality of tax accounting to explain future tax cash flows.

The work of the statutory auditor is designed to detect misleading financial reporting whether due to error or deliberate bias.¹² However, the effectiveness of auditors in protecting shareholders' interests has been challenged where they provide tax-related services (Carr et al., 2021). Following the PCAOB's restriction on auditor-provided tax services (APTS), the quality

¹¹ Estimation errors are a source of low tax accounting quality. This is because they could make the *ex-ante* estimated amount differing from the *ex-post* realized outcome.

¹² We use LSE listed firms in which the audit market is highly concentrated with the Big 4 firms audit 99.8% of the largest 350 firms listed on the exchange (Audit Analytics, 2021). This lack of variation in auditor type choice does not allow testing for auditor quality related hypothesis.

of tax accounting improved (Carr et al., 2021). In the UK, currently there are no similar restrictions on APTS. Instead, there is a reliance on corporate governance guidelines requiring managers to obtain audit committee approval for expenditure on non-audit services in general (Financial Reporting Council, 2016). Effective corporate governance has been found to reduce agency costs of tax management and reassure shareholders as to the beneficiaries of tax management (Desai & Dharmapala, 2009; Wahab & Holland, 2012) and to moderate levels of tax management within firms (Armstrong et al., 2015; Kovermann & Velte, 2019).

A perceived lack of oversight by boards of directors on tax matters in the UK has led to doubts over the effectiveness of corporate governance mechanisms in overseeing decisions related to tax management (Houlder, 2005). In the early 2000s HMRC launched an initiative *Tax in the Boardroom* designed to prompt a change in corporate behavior at the board level. The then Chief Executive and Permanent Secretary of HM Revenue and Customs commented "*Tax is not something you can just push off to your finance people to do in a corner; the main board needs to think about where a company is positioning itself*" (Holmer, 2012). A lack of board involvement can be prompted by the complexity of taxation systems (Edgley & Holland, 2020), leading to a disconnect between initial decisions on levels of tax management and subsequent decisions on accounting quality, including tax accounting quality. Hence, we posit that for a given level of tax management, the subsequent level of tax accounting quality is conditional upon the strength of the corporate governance procedures.

Similarly, effective corporate governance can also serve as an effective mechanism to mitigate earnings management and improve firms' reporting quality (Bhagat & Bolton, 2008; Yu, 2008). While there is undoubtedly complexity associated with applying financial reporting standards, there is less evidence of a systematic absence of board involvement in financial reporting quality. In fact, UK corporate governance guidelines require the operation of a board-level audit sub-committee (Financial Reporting Council, 2016). However, in the presence of

complexity, we examine whether variations in the corporate governance processes could result in a variation in the relationship between a given level of earnings management pressure and the resulting tax accounting quality. Hence, combining the tax management and earnings managements aspects, it is hypothesized that:

H3: The negative relationship between the level of tax management (demand for earnings management) and the quality of tax accounting to explain future tax cash flows is moderated by the level of corporate governance.

Finally, the underlying reporting and measurement requirements of financial reporting standards are a key influence on accounting quality (Barth et al., 2008).¹³ Prior to 2001, in accordance with *Statement of Standard Accounting Practice (SSAP) 15*, firms listed on the London Stock Exchange (LSE) were required to use the partial provisioning method of estimating deferred tax elements. In 2002 the abolition of the partial provisioning method by *Financial Reporting Standard (FRS) 19* brought the UK more into line with *International Accounting Standards (IAS)*.¹⁴ Finally, from 2005 European Union (EU) regulations resulted in domestic FRSs being replaced by IASs for all LSE quoted firms.

Because the full provisioning method is not conditional on managers' prediction about future cash taxes, it is less likely to allow managerial discretion and manipulation. However, compared to the partial provisioning method, the full provisioning may diminish the information content of the tax accounting. The removal of discretion closes an opportunity for managers to convey their private information on firms' future tax positions. Citron (2003) analyzed firms' market valuation and found that moving from a partial (*SSAP 15*) to full

¹³ The focus in this paper on tax accounting quality focuses on measurement although other aspects of quality existing in terms of related narrative disclosures.

¹⁴ Though differences still existed between the new UK standard and the IAS 12. Unlike IAS 12, FRS 19 does not require deferred tax to be provided for when non-monetary assets are revalued or adjusted to their fair values on the acquisition of a business. Also, FRS 19 allows for discounting to reflect the time value of money. In contrast, IAS 12 (revised 1996) prohibits discounting (Financial Reporting Council, 2015).

provisioning method (*FRS 19/IAS 12*) resulted in a loss of relevant information to investors. Against these changes in tax-related reporting standards, it is important to examine for changes in tax accounting quality over time. Hence, it is hypothesized that:

H4: There is a relationship between changes in tax reporting standards and the quality of tax accounting to explain future tax cash flows.

3. Data and Methodology

3.1. Data

This study employs a panel dataset of UK firms listed on the London Stock Exchange (LSE) from 1992 to 2017.¹⁵ The sample frame focuses only on non-financial firms, as financial firms tend to have different financial reporting regulations (Holland, 1998; Hanlon, 2005). Following previous research, firms reporting pre-tax losses or negative current tax expenses are excluded from the sample (Dhaliwal et al., 2004; Hoopes et al., 2012; Hope et al., 2013). In addition, we require each firm included in the sample to have tax data for at least six consecutive years to generate the firm-specific tax measures. The final sample consists of 323 (2,723 firm-year ends) UK quoted non-financial firms. The sample selection process is described in Table 1.

[Insert Table 1 Here]

3.2. Measurements of tax accounting quality

The first step is to construct measures of tax accounting quality ($TAX_QUALITY_{it}$). We follow the methodology employed in Robinson et al. (2016) to examine the incremental

¹⁵ Unless otherwise stated the data is obtained from Refinitiv Datastream. Our sample starts from the year 1992 when data in Datastream is generally available.

explanatory power of income tax accruals in predicting future tax cashflows.¹⁶ We decompose the annual tax expense into its two components, tax paid during the period and year-end tax accrual. We then estimate the following equations (1.1) and (1.2) to examine the relationships between current-period cash taxes paid, current-period income tax accruals, and future cash taxes.

$$Cash\ Tax\ Paid_{i,t+1} = \alpha + \beta Cash\ Tax\ Paid_{i,t} + \varepsilon_{i,t} \quad (1.1)$$

$$Cash\ Tax\ Paid_{i,t+1} = \phi + \partial Cash\ Tax\ Paid_{i,t} + \delta Tax\ Accruals_{i,t} + \varepsilon_{i,t} \quad (1.2)$$

Where:

$Cash\ Tax\ Paid_{i,t}$ = The cash tax paid scaled by lagged total assets for year t

$Tax\ Accruals_{i,t}$ = The difference between income tax expense and cash tax paid scaled by lagged total assets for year t.¹⁷

From the above equations, we measure tax accounting quality as the difference in adjusted R^2 between equations (1.2) and (1.1), the measure is denoted as $\bar{R}_{Tax\ Accrual}^2$. The measure $\bar{R}_{Tax\ Accrual}^2$ represents the incremental explanatory power of income tax accruals for future cash taxes paid (beyond the explanatory power of current-period cash taxes paid). We use the slope coefficient of tax accruals, i.e., $\delta_{Tax\ Accruals}$ from equation (1.2), as our second measure of tax accounting quality to ensure robustness. This measure is commonly used in the value-relevant accounting literature (e.g., Francis & Schipper, 1999; Kothari, 2001; Kim & Kross, 2005).

3.3. Measurements of corporate tax management.

¹⁶ This measure is limited to the ability of tax accruals to explain one-year ahead tax cash flows, based on the assumption that tax estimation errors will be corrected in the subsequent following year. The assumption is reasonable since the UK GAAP and IAS 12 require tax-related estimation errors to be corrected in a timely manner. Untabulated results show that firms' tax and earnings management behaviors do not exert longer impact on tax accrual quality.

¹⁷ Our measure of income tax accruals does not capture permanent differences between accounting and tax regulations, as permanent differences affect income tax expense and cash tax payment in the same manner.

We use two variables to measure corporate tax management, ETR_CASH_{it} and $HIGH_TAXMANAGE_{it}$. ETR_CASH_{it} is calculated as the sum of cash taxes paid over a five-year period scaled by the sum of pre-tax income over the same five-year period (Dyreng et al., 2008; Guenther et al., 2017).^{18 19} A lower ETR_CASH_{it} indicates a greater ability to reduce tax payments through engaging in tax management activities. $HIGH_TAXMANAGE_{it}$ is a binary variable which equals 1 if a firm's ETR is in the lowest quintile within the pooled sample of firms, and 0 otherwise (Blaylock et al., 2012). Hypothesis 1 predicts a positive (negative) association between the variables ETR_CASH_{it} and $HIGH_TAXMANAGE_{it}$ respectively and tax accounting quality.

3.4. Measurements of earnings management pressure

Managers may use earnings management techniques to meet earnings expectations as set by capital markets. Following Dhaliwal et al. (2004) and Holland and Jackson (2004), this study considers two situations where pressure to employ such techniques may be particularly strong: (1) to avoid reporting a post-tax earnings decline; and (2) to avoid failing to meet analysts' forecasted earnings.

To continually report improved earnings performance, firms may treat their previous year's post-tax profit as a minimum earnings target. Therefore, firms that experience a decline in their pre-tax profit are expected to be under stronger pressure to bias their tax accruals to

¹⁸ We use five-year cash effective tax rate (ETR) rather than book-tax difference (BTD) to measure tax management because of its several benefits. First, annual tax measures may not be a good measure of firms' tax management behaviors because the year-to-year variations may "*obscure the inference about a firm's tax avoidance*" (Dyreng et al., 2008 pp. 65). Second, using the cash ETRs is beneficial because it could capture "real" tax management activities that affect cash flows (Hanlon, 2005). Third, BTDs and ETRs are directly rated. It can be shown that a firm's ETR measure minus the statutory tax rate is equivalent to its book-tax difference (Wahab & Holland, 2015). Our results remain robust if we use three-year cash ETR to measure tax management. We thank the anonymous reviewer for raising this point.

¹⁹ Following extensive previous literature (Kim et al., 2011; Guenther et al., 2017), we winsorize effective tax rates to values between 0 and 1 to control for the extreme values and ensure a reasonable economic interpretation of effective tax rates. Our results remain statistically unchanged if we drop the extreme values of ETRs at 1% and 99%.

improve their post-tax performance. Following Holland and Jackson (2004), our first earnings target variable $TARGET1_{it}$ is defined as a binary variable which equals 1 if the level of a firm's pre-tax profit is lower than in the previous year, and 0 otherwise. The variable $DECLINE_AMOUNT_{it}$ captures the magnitude of the difference between a firm's previous year's pre-tax profit and current year's pre-tax profit. Our variable of interest is the interaction term $TARGET1_{it} * DECLINE_AMOUNT_{it}$ ²⁰.

To show their competence to capital markets (Yu, 2008), managers may aim to at least meet financial analysts' consensus earnings forecast. If a firm's pre-tax profits fall below the consensus level, pressure to manage earnings through biasing tax accruals might increase. Our second earnings target variable $TARGET2_{it}$ is denoted as a binary variable which equals 1 if a firm's actual pre-tax profit is less than analysts' consensus forecast as reported in I/B/E/S, and 0 otherwise. The variable $MISSING_AMOUNT_{it}$ captures the magnitude of the difference between analysts' forecast and the actual pre-tax profit reported in I/B/E/S.²¹ Our variable of interest is the interaction term $TARGET2_{it} * MISSING_AMOUNT_{it}$.

3.5. Regression models

3.5.1. Regression models for H1

Our first hypothesis H1 investigates the relationship between tax management and the quality of tax accounting. We predict a negative association between the level of tax management and the quality of tax accounting. Employing the two alternate measures of tax management, we use the following equations (2.1) and (2.2) to test H1.

²⁰ We use the interaction term because we are interested in examining not only whether, but also by how much a firm underperforms its target affect the tax accounting quality. Our analyses are based on the assumption that earnings management pressure mainly exists in the underperforming firms, and the more a firm underperforms its target, the higher the earnings management pressure. The relation between earnings pressure and tax accounting quality may be non-linear. Employing a single variable (e.g., $TARGET1_{it}$ or $TARGET2_{it}$) rather than the interaction terms could only reflect the linear association.

²¹ We replace missing values of actual pre-tax profit reported in I/B/E/S with actual pre-tax profit reported in Datastream. Our results remain statistically unchanged if we drop the missing values.

$$TAX_QUALITY_{it} = \partial_0 + \partial_{1c} ETR_CASH_{it} + \sum \partial_{2c} FIRM_CHARA_{it} + \partial_{industry} + \partial_{year} + \varepsilon_{it} \quad (2.1)$$

$$TAX_QUALITY_{it} = Y_0 + Y_{1c} HIGH_TAXMANAGE_{it} + \sum Y_{2c} FIRM_CHARA_{it} + Y_{industry} + Y_{year} + \varepsilon_{it} \quad (2.2)$$

The dependent variable $TAX_QUALITY_{it}$ is the quality of tax accruals in explaining one-year-ahead tax cash flows. It is measured alternatively by $\bar{R}_{Tax\ Accrual}^2$ and $\delta_{Tax\ Accruals}$ as described in section 3.2. Our variables of interest are ETR_CASH_{it} and $HIGH_TAXMANAGE_{it}$. The variable ETR_CASH_{it} is the sum of cash taxes paid over a five-year period scaled by the sum of pre-tax income over the same five-year period. $HIGH_TAXMANAGE_{it}$ is a binary variable which equals 1 if a firm's five-year cash ETR is in the lowest quintile, and 0 otherwise.

We include a set of control variables to capture firm characteristics ($FIRM_CHARA_{it}$) that prior studies have shown to be associated with tax accounting quality. It is important to control for firms' operational uncertainty as even in the absence of intentional bias, operational uncertainty can increase difficulties in estimating firms' current and future tax positions resulting in estimation bias. Following Guenther et al. (2017), we use the volatility of pre-tax income (VOL_PTBI_{it}) to control for operational uncertainty. Profitability ($PTBI_{it}$) is included to capture the magnitude of resources potentially available to facilitate tax management (Mills et al., 1998; Choudhary et al., 2016). Besides, more profitable firms may have stronger incentives for tax management.

Discontinued operations and extraordinary items ($DISCONTINUE_{it}$) are often reported net of income taxes separately from continuing activities, although their cash tax consequences

are reported in cash flow statements (Hanlon, 2003).²² However, tax accruals stemming from this disparity are not designed to mitigate the timing issues and, thus, cannot inform future tax cash flows (Choudhary et al., 2016). In addition, the deferred tax balance ($DEFER_{it}$) is included to control for the potential noise in our measure of tax accounting quality arising from long-term deferred tax movements not being anticipated to reverse within one year.

The regression models also include variables capturing a range of firm operating characteristics previously linked to tax and earnings management. Specifically, we control for six factors as follows: (i) capital intensity ($CAPINT_{it}$) because claiming tax-deductible capital allowances on property, plant, and equipment is a well-established and benign tax-favored investment with relatively predictable tax outcomes, (ii) leverage ($LEVERAGE_{it}$) as highly levered firms may engage in earnings management to loosen debt covenant constraints (Dhaliwal et al., 1982; Dhaliwal et al., 1991; Skinner, 1993; Phillips et al., 2004); (iii) growth ($GROWTH_{it}$) because growing firms tend to have more opportunities for tax management due to their pursuit of entering into new business and geographic markets (Higgins et al., 2015), (iv) size ($SIZE_{it}$) and (v) operational dispersion ($SEGMENT_{it}$), because larger firms and firms operating in highly dispersed business environments may face difficulties in communication and coordination in respect of taxation and tax reporting (Gallemore & Labro, 2015). Industry and year fixed effects are included to control for the systematic difference in the tax treatments across industries and years (Omer et al., 1993; Holland, 1998; Jayaraman, 2008; Wahab & Holland, 2015).

3.5.2. Regression models for H2

Our second hypothesis H2 examines the relationship between earnings management pressure and tax accounting quality. Employing the two alternate measures of tax management,

²² Results remain statistically identical if omitting firms exhibiting discontinued operations and extraordinary items from the sample.

we use the following equations (3.1) and (3.2) to test H2.

$$\begin{aligned} TAX_QUALITY_{it} = & \tau_0 + \tau_{1c}TARGET1_{it} + \tau_{2c}DECLINE_AMOUNT_{it} + \\ & \tau_{3c}TARGET1_{it} * DECLINE_AMOUNT_{it} + \sum \tau_{4c}FIRM_CHARA_{it} + \\ & \tau_{industry} + \tau_{year} + \varepsilon_{i,t} \end{aligned} \quad (3.1)$$

$$\begin{aligned} TAX_QUALITY_{it} = & K_0 + K_{1c}TARGET2_{it} + K_{2c}MISSING_AMOUNT_{it} + \\ & K_{3c}TARGET2_{it} * MISSING_AMOUNT_{it} + \sum K_{4c}FIRM_CHARA_{it} + \\ & K_{industry} + K_{year} + \varepsilon_{i,t} \end{aligned} \quad (3.2)$$

The dependent variable $TAX_QUALITY_{it}$ is the quality of tax accruals in explaining one-year-ahead tax cash flows. It is alternatively measured by $\bar{R}_{Tax\ Accrual}^2$ and $\delta_{Tax\ Accruals}$ as described in section 3.2. Our variables of interest are the interaction terms $TARGET1_{it} \times DECLINE_AMOUNT_{it}$ and $TARGET2_{it} \times MISSING_AMOUNT_{it}$. We predict that the quality of tax accounting is negatively related to whether and by how much firms' pre-tax earnings miss the earnings targets. Therefore, the coefficients of the interaction terms $TARGET1_{it} \times DECLINE_AMOUNT_{it}$ (τ_{3c}) and $TARGET2_{it} \times MISSING_AMOUNT_{it}$ (K_{3c}) are expected to be negative and significant.²³ We use the same battery of control variables and fixed effects as included in equations (2.1) and (2.2).

3.5.3. Regression models for H3

Our third hypothesis H3 tests for the moderating effect of corporate governance on the hypothesized negative relationship between the level of tax management (earnings management pressure) and the quality of tax accounting. If governance mechanisms are effective in controlling managers' behaviors and financial reporting quality, then any negative

²³ We use the interaction term because we are interested in examining not only whether, but also by how much a firm underperforms its target affect the tax accounting quality. Our analyses are based on the assumption that earnings management pressure mainly exists in the underperforming firms ($TARGET1_{it}=1$), and the more a firm underperforms its target (larger $DECLINE_AMOUNT_{it}$), the higher the earnings management pressure.

impacts of (previously or independently determined) tax management and earnings management pressure should be mitigated in firms with stronger governance mechanisms.

Corporate governance mechanisms employed in this study focus on functions to scrutinize managerial behaviors and ensure the credibility of the firm's financial statements. Specifically, we include: the intensity of analyst coverage ($COVERAGE_{it}$) measured as the logarithm of the number of financial analysts covering a firm-year (Yu, 2008). Previous research suggests that financial analysts have superior industry knowledge and expertise in accounting and finance, enabling them to act as effective external monitors in mitigating opportunistic earnings management and ensuring financial reporting quality (Yu, 2008). $AUDIT_EXPERT_{it}$ is a binary variable showing whether the audit committee has financial expertise in a firm-year. Financial experts on the audit committee could significantly improve audit committee effectiveness in monitoring financial reporting (Wu et al., 2016). $INSTITUTION_{it}$ is the percentage of shares held by institutional shareholders for a firm-year. Institutional shareholders have the resources and are more sophisticated in scrutinizing managers than individual investors (Kim et al., 2011). Institutional shareholders' incentive to monitor managers is partially a function of the size of their shareholdings (Chung et al., 2002).

To examine for moderating or interaction effects of corporate governance mechanisms and the relationship between corporate tax management and quality of tax accounting, we employ the interaction terms $ETR_{it} \times COVERAGE_{it}$, $ETR_{it} \times AUDIT_EXPERT_{it}$ and $ETR_{it} \times INSTITUTION_{it}$ in augmented versions of Equations (2.1) and (2.2). Similarly, to test whether governance mechanisms moderate the relationship between earnings management pressure and tax accounting quality, we include in Equations (3.1) and (3.2) the related interaction

terms: $DECLINE_AMOUNT_{it} \times COVERAGE_{it}$, $DECLINE_AMOUNT_{it} \times AUDIT_EXPERT_{it}$ and $DECLINE_AMOUNT_{it} \times INSTITUTION_{it}$.²⁴

We use the same battery of control variables and industry and year fixed effects as included in Equations (2.1) and (2.2).

3.5.4. Regression models for H4

Our fourth hypothesis H4 investigates whether there is a relationship between changes in tax reporting standards and the quality of tax accounting. Under *SSAP 15*, deferred taxes are recognized on a partial provision basis. By comparison, *FRS 19* and *IAS 12* adopt versions of the full provision basis, whereby all taxable temporary (or timing) differences should be recognized in the deferred tax accounts, irrespective of their likelihood of reversal. We predict that the adoption of different tax accounting standards has an impact on tax accounting quality. To test this hypothesis, we use the following Equation (4.1) and (4.2).

$$\text{Linear Trend Model: } TAX_QUALITY_{it+1,it+5} = \vartheta_0 + \vartheta_1 YEAR + \varepsilon_{i,t} \quad (4.1)$$

$$\text{Three-Period Model: } TAX_QUALITY_{it+1,it+5} = \Pi_0 + \Pi_1 PERIOD + \varepsilon_{i,t} \quad (4.2)$$

The dependent variable $TAX_QUALITY_{it}$ is the quality of tax accruals in explaining one- to five-year ahead tax cash flows. In Equation (4.1), $YEAR$ is set to one in the initial sample year and increasing by one for every sample year thereafter. In Equation (4.2), $PERIOD$ breaks the entire sample into three periods representing each of the three different standards adopted in the UK. Specifically, $PERIOD$ is set to zero for 1992 to 2000 when the partial provision method was adopted under *SSAP 15*; set to one for 2001 to 2004 when the (amended)

²⁴ To avoid the multicollinearity concerns induced by three-way interaction terms, we employ interaction terms between $DECLINE_AMOUNT_{it}$ and corporate governance mechanisms, where a larger $DECLINE_AMOUNT_{it}$ indicates stronger earnings management pressure through biasing tax accruals. Our results remain statistically unchanged if we use the three-way interaction terms.

full provision method was adopted under *FRS 19*; and set to two for 2005 to 2017 when the full provision method was adopted under *IAS 12*.²⁵

Unless otherwise specified, in the above models, all continuous variables are deflated by lagged total assets and winsorized at the 1st and 99th percentiles. The Huber-White standard errors are employed to control for the heteroskedasticity and are clustered at the firm level to mitigate concern about the cross-sectional dependence in the error terms (Petersen, 2009).²⁶ All variables used in regression analyses are summarized in Table 2.

[Insert Table 2 Here]

4. Regression Results

4.1 Descriptive statistics

Panel A of Table 3 reports summary statistics for all variables used in our regression analyses. It shows that tax accruals on average explain 24.30 percent of the variation in one-year-ahead cash tax payments (mean of $\bar{R}_{Tax\ Accrual}^2$ is 0.2430), and a one unit change in tax accruals leads to an average of 0.6998 unit change in the one-year-ahead cash taxes (mean of $\delta_{Tax\ Accruals}$ is 0.6998). The mean value of *ETR_CASH* is 27.24%, which is comparable to those of prior studies (Wahab & Holland, 2012; Minnick & Noga, 2010; Hasan et al., 2014; Gaertner, 2014). On average, 30.74 percent of firm-years in the sample report pre-tax profit lower than the previous year (mean of *TARGET1_{it}* is 0.3074), and 15.78 percent of firm-years

²⁵ Changes in tax accounting quality can be non-linear. In order to address this concern, we employ two binary variables (set to 1 for a specific time period, and 0 otherwise) and use Wald test to test the equality of coefficients. Untabulated results confirm our original results and show that tax accounting quality is the strongest in the first period (1992 to 2000), “moderate” in the second period (2001 - 2004) and “weakest” in the third period (2005 - 2017). The two coefficients of the two binary variables are each significantly greater than zero (at the 1% level) and significantly different from each other (at the 1% level). We thank the anonymous reviewer for raising this point.

²⁶ When using a panel dataset, it is important to address the cross-sectional dependence problems because firms may have repeated features across times and that the OLS estimation can be biased if the residuals are correlated. Following Petersen (2009), we cluster the error terms at the firm level to alleviate the concerns about cross-sectional correlations.

in the sample report pre-tax profits that are lower than analysts' consensus forecasts (mean of $TARGET2_{it}$ is 0.1578).

Panel B of Table 3 provides univariate comparisons of our dependent variables in different sample groups. It shows that tax accounting quality (as measured by $\bar{R}_{Tax\ Accrual}^2$ and $\delta_{Tax\ Accruals}$) is significantly lower in firms with a higher level of tax management ($HIGH_TAXMANAGE = 1$) and in firms whose current pre-tax profit underperforms its previous year ($TARGET1 = 1$). However, the tax accounting quality is not significantly different between firms that either miss or meet analysts' forecasts ($TARGET2$).

[Insert Table 3 Here]

Table 4 shows that the two measures of firm-specific quality of tax accounting ($\bar{R}_{Tax\ Accrual}^2$ and $\delta_{Tax\ Accruals}$) are highly correlated, with a correlation coefficient of 0.572. Both measures of tax accounting quality are positively (negatively) correlated with ETR_CASH_{it} ($HIGH_TAXMANAGE_{it}$). In addition, both measures of tax accounting quality are negatively correlated with $TARGET1_{it}$ and $DECLINE_AMOUNT_{it}$. However, the negative correlations between measures of tax accrual accounting and $TARGET2_{it}$ and $MISSING_AMOUNT_{it}$ are not significant at 5% level. We explore these relations in greater detail in the multivariate tests below.²⁷

[Insert Table 4 Here]

4.2 Baseline results

Tables 5 to 11 present our main results. For each hypothesis, two sets of results are reported, each reflecting the two alternate measures of tax accounting quality described in section 3.2. Unless otherwise specified, we control for the industry- and year-fixed effects. All

²⁷ Untabulated results show that Variance Inflation Factor (VIF) for all regression tests is below 10, indicating that multicollinearity is not a severe problem.

standard errors are adjusted for the heteroskedasticity and are clustered at the firm level to mitigate concern about the cross-sectional dependence in the error terms.

4.2.1. Test of H1

Table 5 presents the results of the relationship between corporate tax management and tax accounting quality. As shown in Table 5, the coefficients of $HIGH_TAXMANAGE_{it}$ are significant and negative (-0.1619 with $t=-2.16$ and -0.0984 with $t=-3.44$, respectively), and the coefficients of ETR_CASH_{it} are significant and positive (0.5809 with $t=1.73$ and 0.3812 with $t=2.23$, respectively). These results are consistent with hypothesis H1 that the quality of tax accounting is significantly lower for firms undertaking higher levels of tax management.

[Insert Table 5 Here]

4.2.2. Test of H2

Table 6 and Table 7 report whether tax accounting quality is associated with firms' earnings management pressure. Table 6 reports results based on the first earnings target. The coefficients of the interaction term $TARGET1_{it} \times DECLINE_AMOUNT_{it}$ are negative and significant at the 5% level in both specifications. When $TARGET1_{it} = 1$, the sum of the coefficients on $DECLINE_AMOUNT_{it}$ ($\tau_{2c} + \tau_{3c}$) is also negative in both specifications. These results indicate that in the underperforming group ($TARGET1_{it} = 1$), the larger the decline in current years' pre-tax profit (larger $DECLINE_AMOUNT_{it}$), the lower the tax accounting quality. The results indicate that firms with stronger earnings management pressure are more likely to report less informative tax information.²⁸

²⁸ Untabulated results show that if we split the entire sample according to whether firms underperform their previous year ($TARGET1_{it}$ equals 1 or 0), the negative impact of $DECLINE_AMOUNT_{it}$ on tax accounting quality is significant only in underperforming firms ($TARGET1_{it} = 1$). This relation does not exist in outperforming group ($TARGET1_{it} = 0$). The results confirm that earnings management pressure exists a negative and significant impact on tax accounting quality. Results are available from authors upon request.

Table 7 reports results based on the second earnings target. Inconsistent with our expectations, the coefficients of the interaction term $TARGET2_{it} \times MISSING_AMOUNT_{it}$ are insignificant. These results suggest that firms are not motivated to beat analysts' forecasts through biasing their tax reporting.

[Insert Table 6 and 7 Here]

4.2.3. Test of H3

Table 8 reports results of the testing for a moderating effect of governance mechanisms on the relationship between corporate tax management and tax accounting quality. The results reported in Table 8 show that all the coefficients of the interaction terms are insignificant at the 5% level, which implies that corporate governance mechanisms do not play a significant role in moderating the negative impacts of tax management on tax accounting quality.

In contrast, the results reported in Table 9 show that the coefficients of the interaction term $DECLINE_AMOUNT_{it} \times COVERAGE_{it}$ are positive and significant, which indicates that greater analysts' coverage mitigates the negative impacts of earning management pressure on tax accounting quality.

[Insert Table 8 and 9 Here]

Moving onto the control variables, from our regression analyses we find evidence that tax accounting quality is higher for firms with higher pre-tax income, smaller size, less growth rate, and lower level of leverage. Taken together, our results show that the tax accounting quality is significantly lower for firms that engage in higher levels of tax management activities or have a level of pre-tax earnings lower than in the previous year. Corporate governance mechanisms do not mitigate the negative impact from tax management, but a greater analysts' coverage has a moderating effect in the relationship between earnings management pressure and tax accounting quality.

4.2.4. Test of H4

Figures 1 and 2 provide visual evidence on the time trend of tax accrual ability to explain future one- to five-year ahead cash taxes over the 26 sample years. As shown from Figure 1 and 2, there is a clear downward trend in tax accrual ability to explain future cash taxes.

[Insert Figure 1 and 2 Here]

Table 10 and Table 11 present regression results of the time trends in tax accounting quality based on the entire sample period (1992 to 2017) and the three subperiods (1992-2000 under *SSAP 15*, 2001-2004 under *FRS 19*, and 2005-2017 under *IAS 12*). Panel A of Table 10 and 11 shows results based on the full sample whereas Panel B shows results based on a constant sample. The constant sample consists of firms that survive over at least 24 of the 26 sample years to mitigate the impact of selection bias on the observed time trend.²⁹

As shown in Table 10 and Table 11, the coefficients on the time trend variables *YEAR* and *PERIOD* are negative and significant at the 1% level, confirming the downward trend of tax accounting quality in explaining future cash taxes. Specifically, the significant and negative coefficients on *PERIOD* indicate that the tax accounting quality is greater during the period 1992-2000 when deferred taxes were recognized under the partial provision method.³⁰

[Insert Table 10 and 11 Here]

²⁹ Since firms in the full sample are only required to survive for at least six consecutive years, the increase (decrease) in tax accrual quality based on full sample firms may only indicate that as compared to firms existed in the 1990s, firms in existence today have stronger (weaker) relations between tax accruals and future cash taxes. Adopting a constant sample could mitigate this concern.

³⁰ Untabulated results show that coefficients on *YEAR* and *PERIOD* remain negative and significant after including industry fixed effects and controlling for changes in firm characteristics and governance structures over years. Results are available from authors upon request.

5. Robustness Tests

5.1 Inclusion of loss-making firms

In the main regressions above, we exclude firms that report negative pre-tax income to control the unobservable effects of tax losses and ensure a meaningful interpretation of effective tax rates. Moreover, previous studies show that profit-making firms have different financial reporting and tax management incentives than their loss-making counterparties (Hoopes et al., 2012). However, excluding loss firms restricts our sample size and limits the generalizability of our inferences to profitable firms. We re-estimate our main tests with the inclusion of firms that report pre-tax losses to mitigate the survivorship bias.³¹ Results reported in Table 12 are consistent with our main results, indicating that our inferences can be generalized to loss-making firms.

[Insert Table 12 Here]

5.2 Control for pre-tax earnings management

In common with all measures of tax management based only on data from financial reports, our measure may be biased by the level of pre-tax accruals management (Kim et al., 2011). We include $DIS_ACCRUAL_{it}$ to account for pre-tax accruals earnings management and to isolate the interaction between accounting and tax accruals provisions. This variable is measured as the absolute value of discretionary accruals estimated using the modified Jones model (Dechow et al., 1995; Hutton et al., 2009). Results reported in Table 13 are consistent

³¹ In the main test, we exclude firms experiencing pre-tax loss in a specific firm-year. In the robustness test, we follow Guenther et al. (2017) and relax this restriction by including firms that experience a pre-tax loss but their five-year ETR is not negative. Meanwhile, we follow the procedure adopted in the main test to eliminate firms with extreme levels of ETRs. Therefore, although we include loss firms in our robustness test, our results are not affected by the confounding effects of negative or extreme ETRs.

with our main results, indicating that our results are not driven significantly by pre-tax accruals earnings management.

[Insert Table 13 Here]

5.3 One-stage estimation approach

In the main regressions above we use a two-stage estimation approach by firstly estimating the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}_{Tax\ Accrual}^2$) for each firm. In this section, we employ a one-stage estimation approach. Compared with the two-stage estimation approach which focuses more on the cross-sectional variations in tax accounting quality, a one-stage approach examines both the cross-sectional and the inter-temporal variations (Donnelly & Lynch, 2002). We employ the firm-fixed effect in the one-stage analyses to mitigate endogeneity concerns induced by omitted variables.³² The one-stage approach is tested using the following Equations (5.1) and (5.2).

$$\begin{aligned} Cash\ Tax\ Paid_{i,t+1} = & \emptyset + \partial_1 Cash\ Tax\ Paid_{i,t} + \partial_2 Tax\ Accruals_{i,t} + \partial_3 Tax\ Accruals_{i,t} \times \\ & HIGH_TAXMANAGE_{it} + \sum \partial_4 FIRM_CHARA_{it} + \partial_{firm} + \partial_{year} + \varepsilon_{i,t} \end{aligned} \quad (5.1)$$

$$\begin{aligned} Cash\ Tax\ Paid_{i,t+1} = & \emptyset + Y_1 Cash\ Tax\ Paid_{i,t} + Y_2 Tax\ Accruals_{i,t} + Y_3 Tax\ Accruals_{i,t} \times \\ & TARGET1_{it} + \sum Y_4 FIRM_CHARA_{it} + Y_{firm} + Y_{year} + \varepsilon_{i,t} \end{aligned} \quad (5.2)$$

Table 14 reports the regression results of the one-stage approach. The negative and significant coefficients on $Tax\ Accruals_{i,t} \times HIGH_TAXMANAGE_{it}$ and $Tax\ Accruals_{i,t} \times TARGET1_{it}$ confirm our baseline results, which indicates that tax accounting quality in predicting future tax cash flows is lower for firms with either higher levels of tax management or that experience a decline in their current-year pre-tax profit.

³²The Hausman test favors the fixed-effect model over random-effect model (Prob>chi2=0.003). Therefore, we employ the firm fixed-effect panel model in the one-stage estimation. Firm fixed-effects panel model is also a procedure to produce consistent parameter estimates robust to unobservable heterogeneity and to mitigate estimation issues associated with endogeneity (Petersen, 2009).

[Insert Table 14 Here]

5.4 Alternative measures of control variables

In this section, we check whether our results are sensitive to the measurement of the control variables. In the main tests, dispersed operation is proxied by the number of firms' operational segments ($SEGMENT_{it}$). Alternatively, we use the intensity of foreign operations ($FOREIGN_{it}$) to capture operational dispersion. In the main tests, operational uncertainty is captured by the volatility of firms' pre-tax income (VOL_PTBI_{it}). Following Holland and Jackson (2004), we alternatively measure the operational uncertainty using the coefficients of variation of sales ($UNCERT_SALE_{it}$) and pre-tax profits ($UNCERT_PTBI_{it}$) forecasted by financial analysts.³³ Untabulated results show that our main results remain statistically unchanged, which suggests that our results are not driven significantly by measures of operational dispersion and uncertainty.

6. Discussion and Conclusions

This study investigates the determinants of firms' tax accounting quality. We find that tax accounting quality is significantly lower for firms engaging in higher levels of tax management or facing stronger earnings management pressure. Our results are consistent with the agency perspective of tax management where tax management can lead to a less transparent information environment (Desai & Dharmapala, 2009; Kim et al., 2011; Balakrishnan et al., 2019). The negative relationship between earnings management pressure and tax accounting quality is consistent with tax accounting as a source of earnings management (Dhaliwal et al., 2004; Holland & Jackson, 2004).

³³ We use the variations of coefficients of sales and pre-tax profits forecasted by financial analysts to capture uncertainty in managers' estimations. According to Holland and Jackson (2004), using variations in analysts' forecasts can better capture difficulties facing managements in the process of estimation and forecasting, as they measure "variability in expectations, rather than variability in outcomes." (pp. 108)

We find no evidence that corporate governance mechanisms moderate the negative relationship between tax management and tax accounting quality. However, we do detect a corporate governance related moderating effect on the association between earnings management pressure and tax accounting quality. These contrasting results can be explained in terms of the relative visibility of earnings management and tax management. While the literature on earnings management extensively documents well defined earnings benchmarks e.g. loss avoidance, earnings growth etc. (Burgstahler & Chuk, 2017), there are no well-defined specific tax management targets. Tax complexity makes it difficult to identify uncertainty surrounding tax management, possibly reducing the ability and effectiveness of corporate governance mechanisms (Armstrong et al., 2015). This finding is consistent with earlier findings that internal and external parties have difficulties in identifying and evaluating firms' tax management positions (Balakrishnan et al., 2019).

We also observe variations in tax accounting quality associated with a change in tax-related financial reporting standards. The mandated change to the full provisioning method of providing for deferred tax was associated with a reduction in tax accounting quality. While requiring full provisioning removes one potential source of earnings management, the requirement comes at the cost of limiting the ability of managers to signal their private information on future expected tax cash flows. This tradeoff has significance in the debate on aligning accounting (book) income and taxable income definitions (Hanlon & Heitzman, 2010).

This study has a number of limitations. First, although effective tax rates are commonly used as proxies for corporate tax management, it is difficult to accurately measure firms' tax performance using publicly available information (Hanlon, 2003). Second, our measure of tax accounting quality does not capture impacts from long-term temporary and permanent book-tax differences. Third, the sample of this study focuses on non-financial LSE-listed firms, which may limit the generalization of the research findings to other types of firms.

Overall, if the quality of tax accounting is to be improved our results call for greater transparency and scrutiny of tax management within firms by managers and internal corporate governance mechanisms. Externally, increased mandated disclosures could act as a substitute for the need for managers to indirectly signal their private information. Such a change could reduce ambiguity over the content of the private information and its existence. Further, increased narrative disclosure surrounding tax management could allow external users to make finer assessments of tax risk and other dimensions of firms' tax management e.g. number of tax computations yet to be agreed with the appropriate tax administrations. However, increased disclosure is not costless with information processing costs and increased potential for disputes as new information could generate misrepresentations (Oats & Tuck, 2019). The difficulty in improving the ability of external users to assess firms' tax management lies in creating an appropriate balance of incentives for appropriate levels of tax management, the capacity to signal private information and unbiased financial reporting (Balakrishnan et al., 2019). Assessing the quality of tax narrative disclosures is a topic worthy of detailed study allowing for a broader definition of tax accounting quality to be developed.

References

- Armstrong, C. S., Blouin, J. L., Jagolinzer, A.D. & Larcker, D.F. (2015). Corporate governance, incentives, and tax avoidance. *Journal of Accounting and Economics*, 60(1), 1-17. <https://doi.org/10.1016/j.jacceco.2015.02.003>
- Audit Analytics. (2021). Who Audits Public Companies – United Kingdom. Retrieved from <https://arc.eaa-online.org/blog/who-audits-public-companies-%E2%80%93-united-kingdom>. Accessed October 22, 2022
- Balakrishnan, K., Blouin, J. L., & Guay, W. R. (2019). Tax aggressiveness and corporate transparency. *The Accounting Review*, 94(1), 45-69. <https://doi.org/10.2308/accr-52130>
- Barth, M.E., Landsman, W.R. & Lang, M.H. (2008). International accounting standards and accounting quality. *Journal of Accounting Research*, 46(3), 467-498. <https://doi.org/10.1111/j.1475-679X.2008.00287.x>
- Bhagat, S., & Bolton, B. (2008). Corporate governance and firm performance. *Journal of Corporate Finance*, 14(3), 257-273. <https://doi.org/10.1016/j.jcorpfin.2008.03.006>
- Blankespoor, E., deHaan, E. & Marinovic, I. (2020). Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics*, 70(2-3), 101344. <https://doi.org/10.1016/j.jacceco.2020.101344>
- Blaylock, B., Shevlin, T., & Wilson, R. J. (2012). Tax avoidance, large positive temporary book-tax differences, and earnings persistence. *The Accounting Review*, 87(1), 91-120. <https://doi.org/10.2308/accr-10158>
- Blouin, J. (2014). Defining and measuring tax planning aggressiveness. *National Tax Journal*, 67(4), 875. <https://www.journals.uchicago.edu/doi/abs/10.17310/ntj.2014.4.06>
- Bonsall IV, S. B., Koharki, K., & Watson, L. (2017). Deciphering tax avoidance: Evidence from credit rating disagreements. *Contemporary Accounting Research*, 34(2), 818-848. <https://doi.org/10.1111/1911-3846.12287>
- Brouwer, A., & Naarding, E. (2018). Making deferred taxes relevant. *Accounting in Europe*, 15(2), 1-31. <https://doi.org/10.1080/17449480.2018.1451903>
- Burgstahler, D. & Chuk, E. (2017). What have we learned about earnings management? Integrating discontinuity evidence. *Contemporary Accounting Research*, 34(2), 726-749. <https://doi.org/10.1111/1911-3846.12301>
- Carr, K. M., Aier, J. K. & Cao, J. (2021). Did PCAOB rules on ethics, independence, and tax services influence financial reporting for income taxes? *Journal of Accounting and Public Policy*, 40(5), 106845. <https://doi.org/10.1016/j.jaccpubpol.2021.106845>
- Choudhary, P., Koester, A., & Shevlin, T. (2016). Measuring income tax accrual quality. *Review of Accounting Studies*, 21(1), 89-139. <https://doi.org/10.1007/s11142-015-9336-9>
- Choudhary, P., Koester, A. and Pawlewicz, R.J. (2021). Tax non-audit services and client income tax estimation error. *Auditing: A Journal of Practice & Theory*, 41(2), 113-139. <https://doi.org/10.2308/AJPT-2020-071>
- Chung, R., Firth, M., & Kim, J. B. (2002). Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance*, 8(1), 29-48. [https://doi.org/10.1016/S0929-1199\(01\)00039-6](https://doi.org/10.1016/S0929-1199(01)00039-6)

- Ciconte, W., Lisowsky, P., Donohoe, M., & Mayberry, M. (2013). Predictable uncertainty: The relation between unrecognized tax benefits and future income tax cash outflows. *Working paper*, University of Illinois at Urbana–Champaign and University of Florida. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2390150
- Citron, D. B. (2003). The valuation of deferred taxation: Evidence from the UK partial provision approach. *Journal of Business Finance & Accounting*, 28(7-8), 821-852. <https://doi.org/10.1111/1468-5957.00395>
- Damodaran, A., John, K., & Liu, C. H. (2005). What motivates managers?: Evidence from organizational form changes. *Journal of Corporate Finance*, 12(1), 1-26. <https://doi.org/10.1016/j.jcorpfin.2004.03.001>
- Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 35-59. <https://doi.org/10.2308/accr.2002.77.s-1.35>
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review*, 70(2), 193-225. http://sseriga.free.fr/course/uploads/FA%20-%20PM/Dechow_et_al_1995.pdf
- Desai, M. A., & Dharmapala, D. (2006). Corporate tax avoidance and high-powered incentives. *Journal of Financial Economics*, 79(1), 145-179. <https://doi.org/10.1016/j.jfineco.2005.02.002>
- Desai, M. A., & Dharmapala, D. (2009). Corporate tax avoidance and firm value. *The Review of Economics and Statistics*, 91(3), 537-546. <https://doi.org/10.1162/rest.91.3.537>
- Dhaliwal, D. S., Gleason, C. A., & Mills, L. F. (2004). Last-chance earnings management: using the tax expense to meet analysts' forecasts. *Contemporary Accounting Research*, 21(2), 431-459. <https://doi.org/10.1506/TFVV-UYT1-NNYT-1YFH>
- Dhaliwal, D. S., Lee, K. J., & Fargher, N. L. (1991). The association between unexpected earnings and abnormal security returns in the presence of financial leverage. *Contemporary Accounting Research*, 8(1), 20-41. <https://doi.org/10.1111/j.1911-3846.1991.tb00832.x>
- Dhaliwal, D. S., Salamon, G. L., & Smith, E. D. (1982). The effect of owner versus management control on the choice of accounting methods. *Journal of Accounting and Economics*, 4(1), 41-53. [https://doi.org/10.1016/0165-4101\(82\)90005-2](https://doi.org/10.1016/0165-4101(82)90005-2)
- Doidge, C., & Dyck, A. (2015). Taxes and corporate policies: Evidence from a quasi natural experiment. *The Journal of Finance*, 70(1), 45-89. <https://doi.org/10.1111/jofi.12101>
- Donnelly, R., & Lynch, C. (2002). The ownership structure of UK firms and the informativeness of accounting earnings. *Accounting and Business Research*, 32(4), 245-257. <https://doi.org/10.1080/00014788.2002.9728973>
- Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008). Long-run corporate tax avoidance. *The Accounting Review*, 83(1), 61-82. <https://doi.org/10.2308/accr.2008.83.1.61>
- Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2019). When does tax avoidance result in tax uncertainty?. *The Accounting Review*, 94(2), 179-203. <https://doi.org/10.2308/accr-52198>
- Dyreng, S. D., Hoopes, J. L., Langetieg, P. & Wilde, J. H. (2020). Strategic subsidiary disclosure. *Journal of Accounting Research*, 58(3), 643-692. <https://doi.org/10.1111/1475-679X.12308>

- Edgley, C. R., & Holland, K. M. (2020). "Unknown unknowns" and the tax knowledge gap: Power and the materiality of discretionary tax disclosures. *Critical Perspectives on Accounting*, 81, 102227. <https://doi.org/10.1016/j.cpa.2020.102227>
- Financial Reporting Council (2015). FRS (Financial Reporting Standard) 19 Deferred Tax. Retrieved from www.frc.org.uk/accountants/accounting-and-reporting-policy/uk-accounting-standards/standards-in-issue/frs-19-deferred-tax. Accessed June 22, 2021
- Financial Reporting Council (2016). Guidance on Audit Committees, Financial Reporting Council, London. Retrieved from <https://www.frc.org.uk/getattachment/6b0ace1d-1d70-4678-9c41-0b44a62f0a0d/Guidance-on-Audit-Committees-April-2016.pdf>. Accessed June 22, 2021
- Financial Reporting Council (2018) The UK Corporate Governance Code, Financial Reporting Council, London. Retrieved from <https://www.frc.org.uk/document-library/corporate-governance/2018/uk-corporate-governance-code-2018>. Accessed June 22, 2021
- Financial Reporting Council (2019). Revised Ethical Standards 2019, Financial Reporting Council, London. Retrieved from <https://www.frc.org.uk/document-library/audit-and-assurance/2019/audit-ethics-dec-2019/revised-ethical-standard-2019>. Accessed June 22, 2021
- Francis, J. R., Neuman, S. S., & Newton, N. J. (2019). Does tax planning affect analysts' forecast accuracy? *Contemporary Accounting Research*, 36(4), 2663-2694. <https://doi.org/10.1111/1911-3846.12515>
- Francis, J., & Schipper, K. (1999). Have financial statements lost their relevance? *Journal of Accounting Research*, 37(2), 319-352. <https://doi.org/10.2307/2491412>
- Frank, M. M., Lynch, L. J., & Rego, S. O. (2009). Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review*, 84(2), 467-496. <https://doi.org/10.2308/accr.2009.84.2.467>
- Gaertner, F. B. (2014). CEO After-Tax compensation incentives and corporate tax avoidance. *Contemporary Accounting Research*, 31(4), 1077-1102. <https://doi.org/10.1111/1911-3846.12058>
- Gallemore, J., & Labro, E. (2015). The importance of the internal information environment for tax avoidance. *Journal of Accounting and Economics*, 60(1), 149-167. <https://doi.org/10.1016/j.jacceco.2014.09.005>
- Guenther, D. A., Matsunaga, S. R., & Williams, B. M. (2017). Is tax avoidance related to firm risk? *The Accounting Review*, 92(1), 115-136. <https://doi.org/10.2308/accr-51408>
- Hanlon, M. & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics*, 50(2-3), 127-178. <https://doi.org/10.1016/j.jacceco.2010.09.002>
- Hanlon, M. (2003). What can we infer about a firm's taxable income from its financial statements? *National Tax Journal*, 56(4), 831-863. <https://doi.org/10.17310/ntj.2003.4.07>
- Hanlon, M. (2005). The persistence and pricing of earnings, accruals, and cash flows when firms have large book-tax differences. *The Accounting Review*, 80(1), 137-166. <https://doi.org/10.2308/accr.2005.80.1.137>
- Hasan, I., Hoi, C. K. S., 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(1), 109-130. <https://doi.org/10.1016/j.jfineco.2014.03.004>

- Higgins, D., Omer, T. C., & Phillips, J. D. (2015). The influence of a firm's business strategy on its tax aggressiveness. *Contemporary Accounting Research*, 32(2), 674-702. <https://doi.org/10.1111/1911-3846.12087>
- HM Revenue & Customs (2020a). Corporate report: Customer compliance: how HMRC's compliance yield is split by business area and our approach to tax compliance and large businesses. Retrieved from www.gov.uk/government/publications/hmrc-annual-report-and-accounts-2019-to-2020/customer-compliance-how-hmrcs-compliance-yield-is-split-by-business-area-and-our-approach-to-tax-compliance-and-large-businesses. Accessed June 12, 2021
- HM Revenue & Customs (2020b). Measuring tax gaps 2020 edition - Tax gap estimates for 2018 to 2019. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907122/Measuring_tax_gaps_2020_edition.pdf. Accessed June 12, 2021
- HM Revenue & Customs (2021). Notification of uncertain tax treatment by large businesses - second consultation. Retrieved from www.gov.uk/government/consultations/notification-of-uncertain-tax-treatment-by-large-businesses-second-consultation. Accessed June 12, 2021
- Holland, K. (1998). Accounting policy choice: The relationship between corporate tax burdens and company size. *Journal of Business Finance & Accounting*, 25(3-4), 265-288. <https://doi.org/10.1111/1468-5957.00187>
- Holland, K., & Jackson, R. H. (2004). Earnings management and deferred tax. *Accounting and Business Research*, 34(2), 101-123. <https://doi.org/10.1080/00014788.2004.9729956>
- Holland, K., Lindop, S. & Abdul Wahab, N. S. (2021). How do managers and shareholders respond to taxation? An analysis of the introduction of the UK real estate investment trust legislation. *Abacus*. 58(2), 334-364. <https://doi.org/10.1111/abac.12239>
- Homer, L. (2012) quoted in Public Accounts Committee - Minutes of Evidence HC 716. Retrieved from <https://publications.parliament.uk/pa/cm201213/cmselect/cmpubacc/716/121105.htm>. Accessed June 12, 2021
- Hoopes, J. L., Mescall, D., & Pittman, J. A. (2012). Do IRS audits deter corporate tax avoidance? *The Accounting Review*, 87(5), 1603-1639. <https://doi.org/10.2308/accr-50187>
- Hope, O. K., Ma, M. S., & Thomas, W. B. (2013). Tax avoidance and geographic earnings disclosure. *Journal of Accounting and Economics*, 56(2-3), 170-189. <https://doi.org/10.1016/j.jacceco.2013.06.001>
- Houlder, V. (2005). Why tax is a task for the boardroom, *Financial Times* 2 March 2005. Retrieved from www.ft.com/content/56f9bcb0-8b4a-11d9-ae03-000000e2511c8. Accessed June 12, 2021
- Hutton, A. P., Marcus, A. J., & Tehranian, H. (2009). Opaque financial reports, R2, and crash risk. *Journal of Financial Economics*, 94(1), 67-86. <https://doi.org/10.1016/j.jfineco.2008.10.003>
- IASB (2018). Conceptual Framework for Financial Reporting, *International Accounting Standards Board*. Retrieved from www.ifrs.org/projects/completed-projects/2018/conceptual-framework. Accessed June 12, 2021

- IFRS (2021) Who uses IFRS Standards? Retrieved from www.ifrs.org/use-around-the-world/use-of-ifrs-standards-by-jurisdiction/#analysis-of-use-of-ifrs-standards-around-the-world. Accessed June 12, 2021
- Jayaraman, S. (2008). Earnings volatility, cash flow volatility, and informed trading. *Journal of Accounting Research*, 46(4), 809-851. <https://doi.org/10.1111/j.1475-679X.2008.00293.x>
- Kim, J. B., Li, Y., & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: Firm-level analysis. *Journal of Financial Economics*, 100(3), 639-662. <https://doi.org/10.1016/j.jfineco.2010.07.007>
- Kim, M., & Kross, W. (2005). The ability of earnings to predict future operating cash flows has been increasing—not decreasing. *Journal of Accounting Research*, 43(5), 753-780. <https://doi.org/10.1111/j.1475-679X.2005.00189.x>
- Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics*, 31(1-3), 105-231. [https://doi.org/10.1016/S0165-4101\(01\)00030-1](https://doi.org/10.1016/S0165-4101(01)00030-1)
- Kovermann, J. & Velte, P., (2019). The impact of corporate governance on corporate tax avoidance—A literature review. *Journal of International Accounting, Auditing and Taxation*, 36, 100270. <https://doi.org/10.1016/j.intaccudtax.2019.100270>
- Lev, B., & Nissim, D. (2004). Taxable income, future earnings, and equity values. *The Accounting Review*, 79(4), 1039-1074. <https://doi.org/10.2308/accr.2004.79.4.1039>
- Lev, B., Li, S., & Sougiannis, T. (2010). The usefulness of accounting estimates for predicting cash flows and earnings. *Review of Accounting Studies*, 15(4), 779-807. <https://link.springer.com/content/pdf/10.1007/s11142-009-9107-6.pdf>
- Mills, L., Erickson, M. M., & Maydew, E. L. (1998). Investments in tax planning. *The Journal of the American Taxation Association*, 20(1), 1-20 <https://www.proquest.com/docview/211139522>
- Minnick, K., & Noga, T. (2010). Do corporate governance characteristics influence tax management? *Journal of Corporate Finance*, 16(5), 703-718. <https://doi.org/10.1016/j.jcorpfin.2010.08.005>
- Oats, L. & Tuck, P., (2019). Corporate tax avoidance: is tax transparency the solution? *Accounting and Business Research*, 49(5), 565-583. <https://doi.org/10.1080/00014788.2019.1611726>
- Omer, T. C., Molloy, K. H., & Ziebart, D. A. (1993). An investigation of the firm size—effective tax rate relation in the 1980s. *Journal of Accounting, Auditing & Finance*, 8(2), 167-182. <https://doi.org/10.1177/0148558X9300800206>
- Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, 22(1), 435-480. <https://doi.org/10.1093/rfs/hhn053>
- Phillips, J. D., Pincus, M., Rego, S. O., & Wan, H. (2004). Decomposing changes in deferred tax assets and liabilities to isolate earnings management activities. *Journal of the American Taxation Association*, 26(s-1), 43-66. <https://doi.org/10.2308/jata.2004.26.s-1.43>
- Plumlee, M. A. (2003). The effect of information complexity on analysts' use of that information. *The Accounting Review*, 78(1), 275-296. <https://doi.org/10.2308/accr.2003.78.1.275>

- Robinson, L. A., Stomberg, B., & Towery, E. M. (2016). One size does not fit all: How the uniform rules of FIN 48 affect the relevance of income tax accounting. *The Accounting Review*, 91(4), 1195-1217. <https://doi.org/10.2308/accr-51263>
- Seida, J. A., & Wempe, W. F. (2004). Effective tax rate changes and earnings stripping following corporate inversion. *National Tax Journal*, 57(4), 805-828. <https://doi.org/10.17310/ntj.2004.4.02>
- Shaw, J., Slemrod, J., & Whiting, J. (2008). Administration and compliance. *Institute for Fiscal Studies, London*. [https://eml.berkeley.edu/~saez/course/Shawetal_IFS\(2009\).pdf](https://eml.berkeley.edu/~saez/course/Shawetal_IFS(2009).pdf)
- Skinner, D. J. (1993). The investment opportunity set and accounting procedure choice: Preliminary evidence. *Journal of Accounting and Economics*, 16(4), 407-445. [https://doi.org/10.1016/0165-4101\(93\)90034-D](https://doi.org/10.1016/0165-4101(93)90034-D)
- Slemrod, J. (2004). *The economics of corporate tax selfishness*. National bureau of economic research. <https://doi.org/10.17310/ntj.2004.4.06>
- Tax Journal (2021). Large business investigations backlog, 24th February 2021 Retrieved from www.taxjournal.com/articles/large-business-investigations-backlog. Accessed January 8, 2021
- Wahab, N. S. A., & Holland, K. (2012). Tax planning, corporate governance and equity value. *The British Accounting Review*, 44(2), 111-124. <https://doi.org/10.1016/j.bar.2012.03.005>
- Wahab, N. S. A., & Holland, K. (2015). The persistence of book-tax differences. *The British Accounting Review*, 47(4), 339-350. <https://doi.org/10.1016/j.bar.2014.06.002>
- Weber, D. P. (2009). Do analysts and investors fully appreciate the implications of book-tax differences for future earnings? *Contemporary Accounting Research*, 26(4), 1175-1206. <https://doi.org/10.1506/car.26.4.7>
- Wu, C. Y. H., Hsu, H. H., & Haslam, J. (2016). Audit committees, non-audit services, and auditor reporting decisions prior to failure. *The British Accounting Review*, 48(2), 240-256. <https://doi.org/10.1016/j.bar.2015.03.001>
- Yu, F. F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics*, 88(2), 245-271. <https://doi.org/10.1016/j.jfineco.2007.05.008>

Table 1
Sample Selection Process

Details	Number of Firms
Publicly listed U.K. firms (Listed throughout the sample period 1992-2017)	5954
Less: Financial firms	(843)
Less: firms with no industry identification	(1265)
Less: firms that report negative pre-tax income	(1993)
Less: firms that report negative current tax expense	(75)
Less: firms that do not report cash tax paid for 6 consecutive years	(1449)
Less: firms with currencies other than sterling	(6)
Final firms	323

Table 2**Variable Definitions**

Variable	Definition	Data Source
$TAX_QUALITY_{it}$	The incremental explanatory power of income tax accruals over cash tax paid in explaining one-year-ahead tax cash flows. It is captured by two alternative measures, i.e., $\bar{R}_{Tax\ Accrual}^2$ and $\delta_{Tax\ Accruals}$.	Datastream
$Cash\ Tax\ Paid_{it}$	The cash tax paid scaled by lagged total assets	Datastream
$Tax\ Accrual_{it}$	The difference between income tax expense and cash tax paid scaled by lagged total assets	Datastream
ETR_CASH_{it}	The sum of cash taxes paid over a five-year period scaled by the sum of pre-tax income over the same five-year period	Datastream
$HIGH_TAXMANAGE_{it}$	A binary variable equals 1 if a firm's five-year cash ETR is in the lowest quintile and 0 otherwise.	Datastream
$TARGET1_{it}$	A binary variable equals 1 if a firm's pre-tax profit of current year is lower than that of its previous year, and 0 otherwise	Datastream
$DECLINE_AMOUNT_{it}$	The difference between a firm's previous period's pre-tax profit and that of the current period, scaled by lagged total assets	Datastream
$TARGET2_{it}$	A binary variable equals 1 if a firm's actual pre-tax profit reported in I/B/E/S is less than that of most recent analysts' forecast consensus, and 0 otherwise.	Refinitiv I/B/E/S
$MISSING_AMOUNT_{it}$	The difference between analysts' forecasted pre-tax profit and the actual pre-tax profit reported in I/B/E/S, scaled by lagged total assets	Refinitiv I/B/E/S
$FIRM_CHARA_{it}$	A vector of variables to capture firm characteristics shown to be associated with tax accounting quality	Datastream
VOL_PTBI_{it}	The standard deviation of annual pre-tax income scaled by lagged total assets over a rolling five-year window.	Datastream
$PTBI_{it}$	The pre-tax income scaled by lagged total assets	Datastream
$SIZE_{it}$	The natural log of total assets	Datastream

<i>SEGMENT_{it}</i>	The number of disclosed segments in which a firm operates	Datastream
<i>GROWTH_{it}</i>	The ratio of firms' market value of equity to the book value of equity	Datastream
<i>CAPINT_{it}</i>	The gross cost of property, plant, and equipment scaled by the lagged total assets	Datastream
<i>LEVERAGE_{it}</i>	The ratio of long-term debt to total assets	Datastream
<i>DISCONTINUE_{it}</i>	The absolute value of earnings from discontinued operations scaled by lagged total assets	Datastream
<i>DEFER_{it}</i>	Deferred tax balances scaled by the lagged total assets	Datastream
<i>DIS_ACCRUAL_{it}</i>	The absolute value of discretionary accruals estimated using the modified Jones model	Datastream
<i>FOREIGN_{it}</i>	Firms' foreign (non-UK) sales divided by the total sales	Datastream
<i>UNCERT_SALE_{it}</i>	The coefficient of variation of analysts' forecasted sales	Refinitiv I/B/E/S
<i>UNCERT_PTBI_{it}</i>	The coefficient of variation of analysts' forecasted pre-tax income	Refinitiv I/B/E/S
<i>COVERAGE_{i,t}</i>	The logarithm of the number of financial analysts covering a firm	Refinitiv I/B/E/S
<i>AUDIT_EXPERT_{i,t}</i>	An binary variable equals 1 if there is financial expertise in a firm's audit committee, and 0 otherwise	Datastream Asset4
<i>INSTITUTION_{i,t}</i>	The percentage of shares held by institutional shareholders	Capital IQ.
<i>Industry</i>	Industry classification using ICB industry code	Datastream
<i>Year</i>	Sample periods from 1992-2017	Datastream
<i>YEAR</i>	<i>YEAR</i> is set to one in the initial sample year and increasing by one for every sample year thereafter	Datastream
<i>PERIOD</i>	<i>PERIOD</i> is set to zero for 1992 to 2000, set to one for 2001 to 2004, and set to two for 2005 to 2017.	Datastream

Table 3
Descriptive Statistics

Panel A: descriptive statistics of the variables used in the regression analyses					
Firm n=323	Observations	Mean	Max	Min	Standard Deviation
$\bar{R}_{Tax\ Accrual}^2$	2,723	0.2430	1.2296	-0.4519	0.3232
$\delta_{Tax\ Accruals}$	2,723	0.6998	3.5789	-1.5415	0.6145
<i>ETR_CASH</i>	1,896	0.2724	1.0000	0.0000	0.0847
<i>HIGH_TAXMANAGE</i>	1,896	0.1878	1.0000	0.0000	0.3906
<i>PTBI</i>	2,723	0.1402	0.5143	0.0072	0.0920
<i>VOL_PTBI</i>	1,697	0.0407	0.2196	0.0043	0.0374
<i>SIZE</i>	2,723	12.4138	17.2603	8.3982	2.0050
<i>GROWTH</i>	2,723	3.0106	17.3300	0.4800	2.6464
<i>CAPINT</i>	2,723	0.2962	1.0828	0.0053	0.2326
<i>LEVERAGE</i>	2,723	0.1361	0.6862	0.0000	0.1471
<i>SEGMENT</i>	2,723	3.9343	10.0000	1.0000	2.4818
<i>DISCONTINUE</i>	2,723	0.0003	0.6814	-0.1508	0.0141
<i>DEFER</i>	2,723	0.0871	4.7510	-0.4341	0.5548
<i>TARGET1</i>	2,723	0.3074	1.0000	0.0000	0.4615
<i>DECLINE_AMOUNT</i>	2,723	-0.0119	0.1996	-0.1770	0.0492
<i>TARGET2</i>	2,199	0.1578	1.0000	0.0000	0.3646
<i>MISSING_AMOUNT</i>	2,199	-0.6882	0.4134	-0.9112	0.3655

Table 3**Descriptive Statistics (Continued)****Panel B: Univariate comparisons of dependent variables in different sample groups**

Variables	<i>HIGH_TAXMANAGE</i> = 0		<i>HIGH_TAXMANAGE</i> = 1		Difference	
	Mean	Median	Mean	Media	Mean	Median
$\bar{R}_{Tax\ Accrual}^2$	0.2586	0.2109	0.1538	0.0696	6.95***	8.08***
$\delta_{Tax\ Accruals}$	0.7070	0.7019	0.5690	0.4276	4.79***	7.64***
	<i>TARGET1</i> = 0		<i>TARGET1</i> = 1		Difference	
	Mean	Median	Mean	Media	Mean	Median
$\bar{R}_{Tax\ Accrual}^2$	0.2862	0.2318	0.2648	0.2109	1.90*	1.94*
$\delta_{Tax\ Accruals}$	0.7512	0.7478	0.7050	0.7016	2.19**	2.42**
	<i>TARGET2</i> = 0		<i>TARGET2</i> = 1		Difference	
	Mean	Median	Mean	Media	Mean	Median
$\bar{R}_{Tax\ Accrual}^2$	0.2126	0.1613	0.2003	0.1502	0.54	0.21
$\delta_{Tax\ Accruals}$	0.6248	0.7016	0.6035	0.6042	0.10	0.75

Notes: Panel A presents descriptive statistics of the variables used in the primary analyses. Panel B presents univariate comparisons of dependent variables among sample groups. Two-samples t-statistics are used to test differences in sample means, and Wilcoxon rank-sum tests are used to test the equality of sample medians. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 4
Pearson Correlation Coefficients

n=323	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)$\bar{R}_{Tax\ Accrual}^2$	1.000																
(2)$\delta_{Tax\ Accruals}$	0.572 (0.000)	1.000															
(3)ETR_CASH	0.122 (0.000)	0.071 (0.001)	1.000														
(4)HIGH_TAXMANAGE	-0.141 (0.000)	-0.098 (0.000)	-0.683 (0.000)	1.000													
(5)PTBI	0.083 (0.000)	0.071 (0.000)	-0.062 (0.003)	-0.068 (0.001)	1.000												
(6)VOL_PTBI	0.116 (0.000)	0.052 (0.015)	0.041 (0.064)	0.035 (0.115)	0.294 (0.000)	1.000											
(7)SIZE	-0.263 (0.000)	-0.124 (0.000)	-0.125 (0.000)	0.097 (0.000)	-0.239 (0.000)	-0.205 (0.000)	1.000										
(8)GROWTH	-0.051 (0.003)	-0.084 (0.000)	-0.027 (0.196)	-0.012 (0.554)	0.524 (0.000)	0.153 (0.000)	0.027 (0.109)	1.000									
(9)CAPINT	0.030 (0.118)	0.054 (0.005)	0.034 (0.133)	-0.029 (0.212)	0.005 (0.778)	-0.054 (0.027)	0.027 (0.163)	-0.041 (0.035)	1.000								
(10)LEVERAGE	-0.222 (0.000)	-0.165 (0.000)	-0.184 (0.000)	0.194 (0.000)	-0.199 (0.000)	-0.129 (0.000)	0.387 (0.000)	0.032 (0.066)	0.054 (0.005)	1.000							
(11)DISCONTINUE	-0.027 (0.128)	-0.025 (0.166)	-0.034 (0.121)	0.045 (0.037)	-0.013 (0.465)	0.018 (0.437)	0.094 (0.000)	0.101 (0.000)	-0.035 (0.082)	0.029 (0.102)	1.000						
(12)SEGMENT	-0.040 (0.000)	0.025 (0.022)	0.033 (0.109)	0.000 (0.989)	0.014 (0.408)	0.114 (0.000)	0.372 (0.000)	0.123 (0.000)	0.115 (0.000)	0.073 (0.000)	0.080 (0.000)	1.000					
(13)DEFER	-0.104 (0.000)	-0.075 (0.000)	-0.100 (0.000)	0.106 (0.000)	-0.079 (0.000)	-0.091 (0.000)	0.257 (0.000)	-0.054 (0.001)	-0.020 (0.298)	0.178 (0.000)	0.008 (0.658)	0.146 (0.000)	1.000				
(14)TARGET1	-0.021 (0.058)	-0.024 (0.029)	0.084 (0.000)	-0.021 (0.306)	-0.326 (0.000)	0.068 (0.002)	-0.016 (0.317)	-0.127 (0.000)	-0.024 (0.219)	0.007 (0.700)	0.041 (0.021)	0.086 (0.000)	0.014 (0.389)	1.000			
(15)DECLINE_AMOUNT	-0.028 (0.054)	-0.036 (0.033)	0.067 (0.001)	-0.025 (0.219)	-0.528 (0.000)	0.005 (0.806)	0.061 (0.000)	-0.205 (0.000)	-0.018 (0.349)	0.015 (0.380)	0.012 (0.515)	0.004 (0.804)	0.039 (0.021)	0.650 (0.000)	1.000		
(16)TARGET2	-0.011 (0.590)	-0.004 (0.923)	-0.169 (0.000)	0.126 (0.000)	-0.070 (0.000)	-0.040 (0.078)	0.275 (0.000)	0.081 (0.000)	-0.105 (0.000)	0.058 (0.002)	0.137 (0.000)	0.144 (0.000)	0.089 (0.000)	0.070 (0.000)	0.067 (0.000)	1.000	
(17)MISSING_AMOUNT	-0.028 (0.483)	-0.026 (0.514)	-0.186 (0.000)	0.147 (0.000)	-0.105 (0.000)	-0.035 (0.115)	0.298 (0.000)	0.054 (0.005)	-0.112 (0.000)	0.086 (0.000)	0.129 (0.000)	0.135 (0.000)	0.160 (0.000)	0.126 (0.000)	0.121 (0.000)	0.807 (0.000)	1.000

Table 5**Regression estimations: The effect of tax management on tax accounting quality**

	$\delta_{Tax\ Accruals}$		$\bar{R}_{Tax\ Accrual}^2$	
	(1)	(2)	(3)	(4)
<i>HIGH_TAXMANAGE</i>	-0.1619** (-2.16)		-0.0984*** (-3.44)	
<i>ETR_CASH</i>		0.5809* (1.73)		0.3812** (2.23)
<i>PTBI</i>	0.5961** (2.01)	0.7300** (2.41)	0.0858 (0.55)	0.1733 (1.07)
<i>VOL_PTBI</i>	0.1817 (0.24)	-0.0081 (-0.01)	0.2451 (0.66)	0.1328 (0.36)
<i>SIZE</i>	-0.0219 (-1.00)	-0.0198 (-0.89)	-0.0354*** (-3.26)	-0.0341*** (-3.10)
<i>GROWTH</i>	-0.0264** (-2.46)	-0.0283*** (-2.62)	-0.0092** (-2.17)	-0.0104** (-2.42)
<i>CAPINT</i>	0.0974 (0.64)	0.0962 (0.63)	0.0998 (1.17)	0.0987 (1.14)
<i>LEVERAGE</i>	-0.2160 (-1.25)	-0.2080 (-1.19)	-0.1381* (-1.72)	-0.1303 (-1.60)
<i>DISCONTINUED</i>	0.5648 (0.88)	0.6350 (0.99)	-0.1284 (-0.48)	-0.0854 (-0.29)
<i>SEGMENT</i>	0.0041 (0.26)	0.0017 (0.10)	-0.0051 (-0.68)	-0.0066 (-0.87)
<i>DEFER</i>	-0.2971 (-0.40)	-0.3351 (-0.45)	0.0514 (0.18)	0.0323 (0.11)
Constant	0.6258* (1.76)	0.4383 (1.17)	0.5165*** (3.03)	0.3937** (2.19)
Industry Fixed Effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Observations	1,651	1,651	1,651	1,651
R-Square	0.104	0.100	0.177	0.173

Note: The dependent variable is the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}_{Tax\ Accrual}^2$). The variables of interest are tax management measures (*HIGH_TAXMANAGE_{it}* and *ETR_CASH_{it}*). All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 6**Regression estimations: The effect of meeting earnings target 1 on tax accounting quality**

	(1)	(2)
	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$
<i>TARGET1</i>	0.0097 (0.37)	0.0091 (0.60)
<i>DECLINE_AMOUNT</i>	1.3728*** (2.77)	0.3863 (1.43)
<i>TARGET1</i> $\times$ <i>DECLINE_AMOUNT</i>	-1.9507*** (-2.66)	-0.7902** (-2.08)
<i>PTBI</i>	0.9726** (2.55)	0.1908 (1.01)
<i>VOL_PTBI</i>	0.4380 (0.55)	0.3070 (0.88)
<i>SIZE</i>	-0.0144 (-0.66)	-0.0335*** (-2.96)
<i>GROWTH</i>	-0.0306*** (-2.69)	-0.0103** (-2.19)
<i>CAPINT</i>	0.0902 (0.59)	0.0922 (1.07)
<i>LEVERAGE</i>	-0.2815 (-1.63)	-0.1784** (-2.18)
<i>DISCONTINUED</i>	1.1888 (1.45)	0.4897 (0.84)
<i>SEGMENT</i>	0.0034 (0.20)	-0.0055 (-0.70)
<i>DEFER</i>	-0.5039 (-0.69)	-0.0580 (-0.20)
Constant	0.7671** (2.32)	0.5794*** (3.28)
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Observations	1,696	1,696
R-Square	0.099	0.164

Note: The dependent variable is the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}^2_{Tax\ Accrual}$). The variable of interest is the interaction term ($TARGET1_{it} \times DECLINE_AMOUNT_{it}$). All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 7**Regression estimations: The effect of meeting earnings target 2 on tax accounting quality**

	(1)	(2)
	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$
<i>TARGET2</i>	0.0107 (0.23)	-0.0136 (-0.47)
<i>MISSING_AMOUNT</i>	-0.0023 (-0.02)	-0.0211 (-0.30)
<i>TARGET2</i> $\times$ <i>MISSING_AMOUNT</i>	3.5985 (1.41)	1.4943 (1.28)
<i>PTBI</i>	0.8757*** (2.84)	0.2731* (1.91)
<i>VOL_PTBI</i>	0.2718 (0.34)	-0.0948 (-0.29)
<i>SIZE</i>	-0.0008 (-0.04)	-0.0300** (-2.51)
<i>GROWTH</i>	-0.0294** (-2.54)	-0.0101** (-2.23)
<i>CAPINT</i>	0.1123 (0.70)	0.0886 (1.01)
<i>LEVERAGE</i>	-0.2680 (-1.53)	-0.1545* (-1.96)
<i>DISCONTINUED</i>	1.1267 (1.50)	0.6094 (1.03)
<i>SEGMENT</i>	-0.0061 (-0.38)	-0.0075 (-1.01)
<i>DEFER</i>	-0.4282 (-0.60)	-0.0305 (-0.11)
Constant	0.6218* (1.68)	0.5564*** (2.87)
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Observations	1566	1566
R-Square	0.143	0.157

Note: The dependent variable is the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}^2_{Tax\ Accrual}$). The variable of interest is the interaction term ($TARGET2_{it} \times MISSING_AMOUNT_{it}$). All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 8**Regression estimations: The effects of tax management and corporate governance mechanisms on tax accounting quality**

	(1)	(2)
	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$
<i>ETR_CASH</i>	-0.4231 (-0.62)	0.2237 (0.55)
<i>COVERAGE</i>	-0.0337 (-0.31)	-0.0143 (-0.24)
<i>AUDIT_EXPERT</i>	-0.1841 (-0.77)	-0.0733 (-0.65)
<i>INSTITUTION</i>	-0.0040 (-1.40)	0.0004 (0.32)
<i>ETR_COVERAGE</i>	0.2284 (0.67)	0.0940 (0.51)
<i>ETR_AUDIT_EXPERT</i>	0.7660 (0.96)	0.2330 (0.62)
<i>ETR_INSTITUTION</i>	0.0090 (1.04)	-0.0012 (-0.28)
<i>PTBI</i>	0.6738** (2.30)	0.1671 (1.04)
<i>VOL_PTBI</i>	-0.2501 (-0.35)	0.1452 (0.39)
<i>SIZE</i>	-0.0340 (-1.29)	-0.0418*** (-3.45)
<i>GROWTH</i>	-0.0250** (-2.46)	-0.0112*** (-2.61)
<i>CAPINT</i>	0.0735 (0.50)	0.0854 (1.01)
<i>LEVERAGE</i>	-0.1795 (-1.03)	-0.1159 (-1.43)
<i>DISCONTINUED</i>	0.6173 (1.03)	-0.0195 (-0.07)
<i>SEGMENT</i>	0.0068 (0.41)	-0.0057 (-0.76)
<i>DEFER</i>	0.0183 (0.03)	0.0747 (0.26)
Constant	0.8627** (2.06)	0.4768** (2.36)
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Observations	1,621	1,621

R-squared	0.119	0.175
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Note: The dependent variable is the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}_{Tax\ Accrual}^2$). The variables of interest are the interaction terms ($ETR_COVERAGE$, ETR_AUDIT_EXPERT and $ETR_INSTITUTION$). All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 9

Regression estimations: The effects of earnings management and corporate governance mechanisms on tax accounting quality

	(1)	(2)
	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$
<i>DECLINE_AMOUNT</i>	-0.5351 (-0.74)	-0.4702 (-1.19)
<i>COVERAGE</i>	0.0261 (0.55)	0.0107 (0.46)
<i>AUDIT_EXPERT</i>	-0.0125 (-0.16)	-0.0118 (-0.33)
<i>INSTITUTION</i>	-0.0017 (-1.12)	0.0001 (0.19)
<i>DECLINE_COVERAGE</i>	0.4582** (2.24)	0.1922* (1.68)
<i>DECLINE_AUDIT_EXPERT</i>	-0.4909 (-1.02)	-0.2903 (-1.35)
<i>DECLINE_INSTITUTION</i>	0.0046 (0.62)	0.0055 (1.36)
<i>PTBI</i>	0.8677** (2.29)	0.1247 (0.66)
<i>VOL_PTBI</i>	-0.1176 (-0.15)	0.1617 (0.45)
<i>SIZE</i>	-0.0237 (-0.84)	-0.0407*** (-3.23)
<i>GROWTH</i>	-0.0296** (-2.56)	-0.0106** (-2.26)
<i>CAPINT</i>	0.0703 (0.45)	0.0787 (0.93)
<i>LEVERAGE</i>	-0.2497 (-1.41)	-0.1649** (-2.02)
<i>DISCONTINUED</i>	1.2026 (1.62)	0.5553 (1.01)
<i>SEGMENT</i>	0.0042 (0.24)	-0.0051 (-0.67)
<i>DEFER</i>	-0.3665 (-0.51)	-0.0098 (-0.03)
Constant	0.8816** (2.46)	0.6370*** (3.65)
Industry Fixed Effect	YES	YES
Year Fixed Effect	YES	YES

Observations	1,666	1,666
R-squared	0.098	0.165

Note: The dependent variable is the tax accounting quality ($\delta_{Tax\ Accruals}$ and $\bar{R}_{Tax\ Accrual}^2$). The variables of interest are the interaction terms *DECLINE_COVERAGE*, *DECLINE_AUDIT_EXPERT* and *DECLINE_INSTITUTION*. All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 10**Regression estimations: Time trend of tax accounting quality measured by $\delta_{Tax\ Accruals}$** **Panel A Full Sample of Firms**

<i>YEAR</i>	<i>N</i>	<i>T+1</i>	<i>T+2</i>	<i>T+3</i>	<i>T+4</i>	<i>T+5</i>
1992-1996	1615	0.8558	0.6796	0.5654	0.4713	0.3896
1997-2001	1615	0.6866	0.5790	0.4347	0.3397	0.3215
2002-2006	1615	0.8626	0.5532	0.4278	0.3328	0.3255
2007-2011	1615	0.5699	0.4811	0.4194	0.3434	0.3556
2012-2017	1938	0.6053	0.3607	0.2976	0.1739	0.0619
Coefficient on the Time		-0.0104	-0.0137	-0.0135	-0.0132	-0.0113
Trend Variable <i>YEAR</i>		(-33.81)***	(-47.83)***	(-26.85)***	(-28.10)***	(-17.36)***
<i>PERIOD</i>	<i>N</i>	<i>T+1</i>	<i>T+2</i>	<i>T+3</i>	<i>T+4</i>	<i>T+5</i>
1 (1992-2000)	2584	0.7726	0.6445	0.5119	0.4335	0.3781
2 (2001-2004)	1615	0.7419	0.5835	0.5281	0.3989	0.2978
3 (2005-2017)	4199	0.6627	0.4273	0.3297	0.2576	0.2521
Coefficient on the Time		-0.0561	-0.1109	-0.0963	-0.0905	-0.0621
Trend Variable <i>PERIOD</i>		(-21.65)***	(-46.98)***	(-27.34)***	(-27.18)***	(-15.51)***

Panel B Constant Sample of Firms

<i>YEAR</i>	<i>N</i>	<i>T+1</i>	<i>T+2</i>	<i>T+3</i>	<i>T+4</i>	<i>T+5</i>
1992-1996	720	0.6878	0.5963	0.4964	0.5250	0.4219
1997-2001	720	0.4858	0.3716	0.2852	0.2381	0.2129
2002-2006	720	0.4146	0.4258	0.4291	0.2914	0.1992
2007-2011	720	0.2748	0.2073	0.2199	0.1178	0.1419
2012-2017	864	0.2199	0.1343	0.1065	0.0647	0.0161
Coefficient on the Time		-0.0221	-0.0214	-0.0173	-0.0192	-0.0176
Trend Variable <i>YEAR</i>		(-42.90)***	(-67.70)***	(-50.83)***	(-49.38)***	(-48.12)***
<i>PERIOD</i>	<i>N</i>	<i>T+1</i>	<i>T+2</i>	<i>T+3</i>	<i>T+4</i>	<i>T+5</i>
1 (1992-2000)	1152	0.5819	0.4823	0.4008	0.3948	0.3243
2 (2001-2004)	720	0.4731	0.4182	0.3938	0.3022	0.2783
3 (2005-2017)	1872	0.2780	0.2201	0.2013	0.1335	0.0821
Coefficient on the Time		-0.1540	-0.13434	-0.1042	-0.1324	-0.1247
Trend Variable <i>PERIOD</i>		(-36.07)***	(-34.58)***	(-28.11)***	(-33.19)***	(-36.10)***

Note: This table reports the time trend of tax accounting quality in explaining future one- to five-year ahead cash taxes as measured by $\delta_{Tax\ Accruals}$. Panel A reports results based on the full sample of firms, whereas Panel B report results based on a constant sample of firms. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 11**Regression estimations: Time trend of tax accounting quality measured by $\bar{R}_{Tax\ Accrual}^2$**

Panel A Full Sample of Firms						
YEAR	N	T+1	T+2	T+3	T+4	T+5
1992-1996	1615	0.2936	0.2174	0.1669	0.1058	0.0781
1997-2001	1615	0.1465	0.1346	0.0964	0.0726	0.0557
2002-2006	1615	0.2361	0.1066	0.0767	0.0799	0.0702
2007-2011	1615	0.0820	0.0580	0.0583	0.0311	0.0388
2012-2017	1938	0.0725	0.0077	0.0226	0.0161	0.0159
Coefficient on the Time		-0.0095	-0.0094	-0.0064	-0.0042	-0.0020
Trend Variable <i>YEAR</i>		(-61.16)***	(-65.89)***	(-56.81)***	(-45.41)***	(-21.55)***
PERIOD	N	T+1	T+2	T+3	T+4	T+5
1 (1992-2000)	2584	0.2397	0.1969	0.1477	0.1032	0.0823
2 (2001-2004)	1615	0.2104	0.1137	0.0995	0.0921	0.0610
3 (2005-2017)	4199	0.0966	0.0375	0.0345	0.0304	0.0437
Coefficient on the Time		-0.0735	-0.0796	-0.0570	-0.0376	-0.0192
Trend Variable <i>PERIOD</i>		(-53.73)***	(-66.60)***	(-54.37)***	(-44.04)***	(-24.35)***
Panel B Constant Sample of Firms						
YEAR	N	T+1	T+2	T+3	T+4	T+5
1992-1996	720	0.0994	0.1356	0.0846	0.0884	0.0734
1997-2001	720	0.1166	0.0783	0.0546	0.0376	0.0196
2002-2006	720	0.0798	0.0936	0.0696	0.0395	0.0187
2007-2011	720	0.0381	0.0241	0.0312	0.0160	0.0164
2012-2017	864	0.0503	0.0204	0.0203	0.0003	-0.0048
Coefficient on the Time		-0.0034	-0.0059	-0.0034	-0.0038	-0.0032
Trend Variable <i>YEAR</i>		(-28.47)***	(-29.31)***	(-27.20)***	(-30.91)***	(-32.29)
PERIOD	N	T+1	T+2	T+3	T+4	T+5
1 (1992-2000)	1152	0.1020	0.1101	0.0754	0.0690	0.0529
2 (2001-2004)	720	0.0968	0.0720	0.0529	0.0333	0.0269
3 (2005-2017)	1872	0.0517	0.0415	0.0349	0.0172	0.0055
Coefficient on the Time		-0.0261	-0.0341	-0.0201	-0.0254	-0.0236
Trend Variable <i>PERIOD</i>		(-26.59)***	(-18.44)***	(-18.10)***	(-23.99)***	(-27.35)***

Note: This table reports the time trend of tax accounting quality in explaining future one- to five-year ahead cash taxes as measured by $\bar{R}_{Tax\ Accrual}^2$. Panel A reports results based on the full sample of firms, whereas Panel B report results based on a constant sample of firms. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 12

Robustness tests: The regression estimations with the inclusion of loss-making firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$	$\delta_{Tax\ Accruals}$	$\bar{R}^2_{Tax\ Accrual}$
<i>HIGH_TAXMANAGE</i>	-0.1489*** (-5.22)	-0.0717*** (-4.95)						
<i>ETR_CASH</i>			0.1919*** (4.68)	0.0947*** (4.35)				
<i>TARGET1</i>					0.0271** (2.39)	0.0208*** (3.28)		
<i>DECLINE_AMOUNT</i>					0.0158 (1.47)	0.0131** (2.09)		
<i>TARGET1</i> $\times$ <i>DECLINE_AMOUNT</i>					-0.0217* (-1.74)	-0.0201** (-2.43)		
<i>TARGET2</i>							0.0167 (0.69)	0.0156 (1.15)
<i>MISSING_AMOUNT</i>							-0.0326 (-0.77)	0.0017 (0.07)
<i>TARGET2</i> $\times$ <i>MISSING_AMOUNT</i>							0.0398 (0.97)	0.0017 (0.08)
<i>PTBI</i>	0.0645 (0.59)	0.0792* (1.83)	0.1772 (1.62)	0.1334*** (3.05)	0.1865 (1.56)	0.1692*** (3.71)	0.0440 (0.27)	0.1643*** (3.45)
<i>VOL_PTBI</i>	-0.1429 (-0.78)	0.0760 (0.72)	-0.3026* (-1.70)	-0.0002 (-0.00)	-0.2717 (-1.38)	0.0060 (0.06)	-0.1274 (-0.58)	0.0296 (0.30)
<i>SIZE</i>	-0.0445***	-0.0416***	-0.0425***	-0.0407***	-0.0391***	-0.0396***	-0.0403***	-0.0392***

	(-5.12)	(-9.54)	(-4.98)	(-9.38)	(-4.58)	(-9.01)	(-4.26)	(-8.59)
<i>GROWTH</i>	-0.0050	-0.0064***	-0.0035	-0.0057***	-0.0039	-0.0064***	-0.0002	-0.0054**
	(-1.04)	(-2.96)	(-0.72)	(-2.63)	(-0.72)	(-2.94)	(-0.03)	(-2.34)
<i>CAPINT</i>	-0.0038	0.0093	-0.0041	0.0090	-0.0009	0.0084	-0.0252	-0.0049
	(-0.07)	(0.35)	(-0.08)	(0.33)	(-0.02)	(0.31)	(-0.47)	(-0.18)
<i>LEVERAGE</i>	-0.1846***	-0.0677*	-0.1955***	-0.0726*	-0.2392***	-0.0826**	-0.1968***	-0.0576
	(-2.73)	(-1.79)	(-2.86)	(-1.91)	(-3.55)	(-2.20)	(-2.69)	(-1.50)
<i>DISCONTINUED</i>	0.0325	-0.0207	-0.0290	-0.0506	-0.0275	-0.0221	-0.0468	-0.0266
	(0.15)	(-0.16)	(-0.13)	(-0.38)	(-0.25)	(-0.37)	(-0.39)	(-0.47)
<i>SEGMENT</i>	0.0337***	0.0081**	0.0357***	0.0091**	0.0369***	0.0090**	0.0362***	0.0092**
	(3.47)	(1.98)	(3.77)	(2.26)	(3.76)	(2.16)	(3.62)	(2.17)
<i>DEFER</i>	-0.2586	-0.0131	-0.2060	0.0122	-0.3780	-0.0134	-0.4276	-0.0366
	(-0.86)	(-0.10)	(-0.68)	(0.09)	(-1.27)	(-0.09)	(-1.40)	(-0.25)
Constant	1.0578***	0.7002***	0.9375***	0.6419***	0.9649***	0.6462***	0.9827***	0.6671***
	(7.89)	(9.35)	(7.22)	(8.66)	(7.47)	(8.92)	(6.53)	(8.27)
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Observations	7,994	7,981	7,994	7,981	8,758	8,734	7,423	7,412
R-squared	0.105	0.140	0.100	0.136	0.090	0.129	0.088	0.119

Note: This table reports regression results with the inclusion of observations with negative pre-tax income. All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 13**Robustness tests: The regression estimations with the control for pre-tax earnings management**

	(1)	(2)	(3)	(4)	(5)	(6)
	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$
<i>HIGH_TAXMANAGE</i>	-0.1666** (-2.26)	-0.0968*** (-3.40)				
<i>ETR_CASH</i>			0.6117* (1.83)	0.3755** (2.18)		
<i>TARGET1</i>					0.0130 (0.51)	0.0090 (0.59)
<i>DECLINE_AMOUNT</i>					1.2705** (2.42)	0.3154 (1.15)
<i>TARGET1</i> $\times$ <i>DECLINE_AMOUNT</i>					-1.8437** (-2.53)	-0.7023* (-1.85)
<i>DIS_ACCRUAL</i>	-0.2249 (-1.02)	-0.0667 (-0.93)	-0.2526 (-1.13)	-0.0829 (-1.13)	-0.2034 (-0.92)	-0.0705 (-0.99)
Control variables	YES	YES	YES	YES	YES	YES
Constant	0.6535* (1.91)	0.5272*** (3.10)	0.4578 (1.26)	0.4071** (2.27)	0.7918** (2.46)	0.5911*** (3.36)
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
Observations	1,630	1,630	1,630	1,630	1,675	1,675
R-squared	0.108	0.182	0.103	0.178	0.101	0.169

Note: This table reports regression results with the control for pre-tax earnings management (*DIS_ACCRUAL*). For brevity, we report only the coefficient estimates on the main variables of interest. All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Table 14

Robustness tests: The regression estimations using one-stage approach stated in Equation 5.1-5.2

	(1)	(2)
	$\delta_{Tax\ Accruals}$	$\bar{R}_{Tax\ Accrual}^2$
<i>Cash Tax Paid</i>	0.6279*** (3.40)	0.6143** (3.24)
<i>Tax Accrual</i>	-7.9186* (-2.30)	-6.7391* (-2.13)
<i>Tax Accrual</i> $\times$ <i>HIGH_TAXMANAGE</i>	-0.6237** (-2.79)	
<i>Tax Accrual</i> $\times$ <i>TARGET1</i>		-3.9206* (-2.24)
Controls	YES	YES
Constant	0.0055 (0.22)	0.0078 (0.42)
Firm Fixed Effect	YES	YES
Year Fixed Effect	YES	YES
Observations	1,445	1,476
R-squared	0.198	0.117

Note: This table reports the results of the one-stage approach as stated in Equations (5.1) and (5.2). For brevity, we report only the coefficient estimates on the main variables of interest. All the t-statistics are adjusted for heteroskedasticity and are clustered at the firm level. Robust t-statistics are presented in parentheses. Significance at the 10%, 5%, and 1% levels is indicated by *, **, and ***, respectively. See Table 2 for variable definitions.

Figure 1: Time Trend of Tax Accounting Quality As Measured by $\delta_{Tax\ Accruals}$

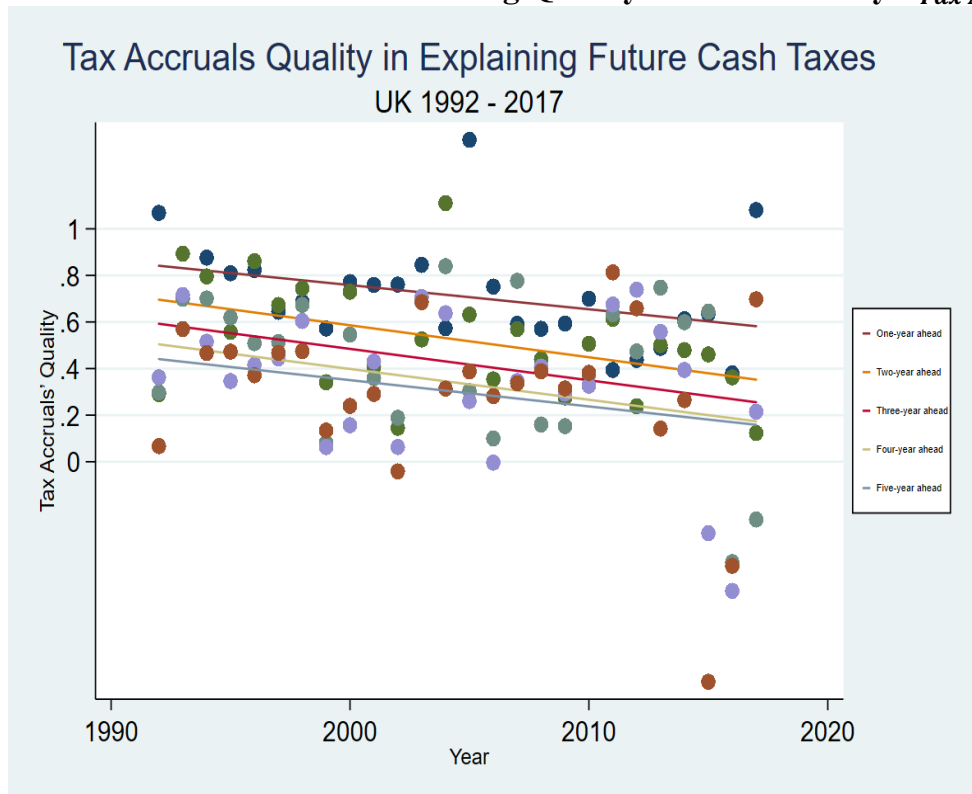


Figure 2: Time Trend of Tax Accounting Quality As Measured by $\bar{R}_{Tax\ Accrual}^2$

