

DEPARTMENT OF ACCOUNTING AND FINANCE

**Audit quality and tax-induced earnings  
management in UK private firms**

**Brenda Van Tendeloo**

**UNIVERSITY OF ANTWERP**  
**Faculty of Applied Economics**



Stadscampus  
Prinsstraat 13, B.213  
BE-2000 Antwerpen  
Tel. +32 (0)3 220 40 32  
Fax +32 (0)3 220 47 99  
<http://www.ua.ac.be/tew>

# **FACULTY OF APPLIED ECONOMICS**

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University of Antwerp, City Campus, Prinsstraat 13, B-2000 Antwerp, Belgium  
Research Administration – room B.213  
phone: (32) 3 220 40 32  
fax: (32) 3 220 47 99  
e-mail: joeri.nys@ua.ac.be

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# **Audit Quality and Tax-Induced Earnings Management in UK Private Firms**

Brenda Van Tendeloo<sup>#</sup>  
University of Antwerp

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## **Abstract**

This paper examines audit quality and tax-induced earnings management in UK private (i.e. non-listed) firms. Tax incentives are considered to play a large role in private firms' earnings management behavior. While Big 4 auditors are generally considered to provide a higher audit quality compared to non-Big 4 auditors, we expect that Big 4 auditors in a weak tax alignment country have weak incentives to constrain tax-induced earnings management. Moreover, Big 4 auditors arguably possess a higher expertise in providing tax advice, which is allowed under the EC recommendation on auditor independence. We provide evidence that UK firms engage more in income-decreasing earnings management and have lower relative tax burdens when they have a Big 4 auditor. These results imply that Big 4 auditors seem to help their clients in engaging in tax-induced earnings management.

<sup>#</sup> Universiteit Antwerpen, Faculty of Applied Economics, Prinsstraat 13, B-2000 Antwerpen, Belgium. E-mail: [brenda.vantendeloo@ua.ac.be](mailto:brenda.vantendeloo@ua.ac.be)

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## **1. Introduction**

Tax incentives are considered to play a large role in private (i.e. non-listed) firms' earnings management behavior. Tax avoidance causes wealth transfers and imposes costs on society. Hence, society requires that a high quality auditor constrains tax-induced earnings management. Prior research has shown that audit quality, captured by auditor size, provides a constraint on earnings management for listed firms when audit firms have incentives to supply a high audit quality (e.g. Becker et al., 1998; Francis et al., 1999; Francis and Wang, 2006; Maijoor and Vanstraelen, 2006).

For private (non-listed) firms, Van Tendeloo and Vanstraelen (2006) find that audit quality differentiation between Big 4 and non-Big 4 audit firms only exists in high tax alignment countries. In these countries, financial statements are taken as the basis for taxation and auditors, who have to assess the fairness of these financial statements, have as such a direct responsibility towards the tax authorities, which carefully scrutinize financial statements. The probability of audit failure detection, which will negatively affect auditor reputation, is therefore higher in these countries. In low tax alignment countries, financial statements and tax returns are more considered to be two separate items, with the auditor only being responsible for the former. Accordingly, Big 4 auditors are expected to have a lower incentive to supply a high quality audit to private client firms in low tax alignment countries. Moreover, tax-induced earnings management could be considered to be more transparent and beneficial to all stakeholders other than the tax authorities (and therefore society in general), contrary to otherwise motivated forms of earnings management. As a consequence, Big 4 auditors could be more inclined to allow this type of earnings management.

Furthermore, the provision of both audit services and tax advisory services, which is still allowed under Sarbanes-Oxley and the new EC recommendation on auditor independence, might lead auditors to help their clients in their tax planning, hereby encouraging tax-motivated earnings management. Because Big 4 auditors are considered to obtain a higher expertise compared to other auditors, one could expect Big 4 auditors to enhance tax-induced earnings management.

This study investigates to what extent Big 4 auditors enhance tax-motivated earnings management in UK private firms. Although tax-motivations can persuade

both public and private firms to engage in earnings management, tax objectives are expected to play a larger role in private firms as they face less of a trade-off if they manage earnings to minimize taxes but hereby make earnings less informative (Ball and Shivakumar, 2005).

The choice for UK companies is motivated by the fact that the UK is a low tax alignment country, in which auditors' incentives to provide a high quality audit to private client firms are considered to be weak. Although financial reporting is not tax-aligned in the UK, prior research has shown that managing reported income for tax purposes is also likely to occur in countries without tax alignment (e.g. Guenther et al., 1997). Moreover, the UK has the largest number of private firms within Europe that are required to have their financial statements audited.

Using a sample of UK private firms over the period 1998-2002, our results suggest that UK firms engage more in income-decreasing earnings management and have lower relative tax burdens when they have a Big 4 auditor. These results imply that Big 4 auditors seem to help their clients in engaging in tax-induced earnings management. Our findings contribute to the current debate on auditor independence and its relation to financial reporting quality.

The remainder of this chapter is organized as follows. In section 2, we review the relevant literature, provide the theoretical background and formulate the research hypothesis. Section 3 describes the research design. The results of the study are presented in section 4. Finally, in section 5, we summarize our results and discuss the implications of our analysis.

## **2. Previous Research and Hypothesis Development**

### *2.1 Tax Incentive to Manage Earnings*

Tax motivations can encourage managers to smooth income, manage earnings downward or shift income to a period with a lower tax rate. Tax minimization is not necessarily the objective of effective tax planning. Firms may also want to reach a certain advantageous earnings level and keep earnings at that level as long as possible (Scholes et al., 2002). Tax management can also include income increasing earnings management. For instance, announcements of a tax rate increase encourage managers to shift future revenues to the current period and defer costs to a later period.

However, tax planning usually comes down to minimizing current taxes and thus managing earnings downward. Hence, we will focus on this type of earnings management to analyse tax-induced earnings management behavior.

In particular, we will focus on manipulation of accruals to manage earnings, as opposed to the structuring of real transactions. As accruals have no direct cash flow effects and are therefore relatively easy to manipulate and difficult to detect, accruals management is likely to be the most favoured instrument for managing earnings (Peasnell et al., 2000). To reduce reported income, managers could, for example, change depreciation methods to increase current depreciation expense. Similar, reported income can be decreased by accelerating the reporting of purchasing certain items using trade credit or delaying the recording of non-cash sales, hereby reducing receivables.

In some continental European countries, with a high alignment between financial reporting and tax accounting, tax-induced earnings management is likely to occur. But also in other countries, like the US and the UK, firms have incentives to make reported income conform to taxable income and hence manage reported income for tax purposes. According to a study by Mills (1998), IRS<sup>1</sup> auditing of corporate tax returns increases with a larger difference between book income and taxable income. Results of Guenther et al. (1997) suggest that the required use of the accrual method for tax purposes causes US firms to defer income for financial statement purposes. They argue that court decisions and IRS behavior in relation to accruals for tax purposes and accruals for financial reporting purposes exercise an implicit pressure to conform tax accounting methods to those used for financial reporting purposes. Moreover, they show that “even if different accrual methods are used for tax and financial statement purposes, it is quite difficult to defer taxable income without deferring financial statement income” as well as “accelerate financial statement income without also accelerating taxable income” (Guenther et al., 1997, p. 232). In this respect, financial reporting and tax accounting are always aligned, even in so-called “low-alignment countries”.

Following the above arguments for US firms, as described by Mills (1998) and Guenther et al. (1997), also UK firms could be expected to engage in tax-induced earnings management since UK firms are also required to use the accrual method for

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<sup>1</sup> US tax authorities are called IRS or Internal Revenue Service.

tax purposes. Under UK tax law, revenue expenses are “generally determined using the accruals concept and normal accounting principles. Interest and other borrowing costs are generally deductible in the accounting period in which they are charged in the accounts” (PricewaterhouseCoopers, 2004).

Although tax-motivations can persuade both public and private firms to engage in earnings management, tax objectives are expected to play a larger role in private firms. While shareholders of public firms are only prepared to supply the company with capital at low cost if the financial information that is provided to them is perceived as high quality, private firms have less incentives to report financial information that reflects economic performance in order to acquire financing at low cost. Accordingly, private firms face less of a trade-off if they manage earnings to minimize taxes but hereby make earnings less informative (Ball and Shivakumar, 2005). Firms with a lesser reliance on external financing therefore tend to display a more aggressive tax management (Klassen, 1997). In this respect, Beatty and Harris (1998) show that public banks show less sensitivity to tax rates in their earnings management behavior than private banks do.

## *2.2 Auditing and Tax-Induced Earnings Management*

European private companies that exceed certain size criteria<sup>2</sup> are required to have their financial statements audited. The statutory auditor is expected to provide different stakeholders of the company assurance concerning the accuracy of the financial statements, the non-existence of financial statement fraud and the going concern status. While the technical capability of auditors or the probability that the auditor will discover material misstatements and going concern breaches is usually assumed to be constant across different auditors, audit quality is assumed to be a function of auditor independence. Until recently, most countries allowed statutory auditors to provide a number of non-audit services to their clients. However, in the aftermath of recent corporate failures, performing non-audit services has been indicted

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<sup>2</sup> In accordance with the Fourth Council Directive (78/660/EEC) of 25 July 1978 only small companies are exempted from a statutory audit. During our sample period 1998-2002, small companies are companies that do not exceed more than one of following criteria: a) Average number of employees: 50; b) Balance sheet total: 3,125,000 EUR; c) Annual net turnover: 6,250,000 EUR. Companies with more than 100 employees are always considered as large companies. These exemption criteria have, however, been revised over time. Since 2005, small companies are defined as companies with less than 50 employees and whose annual turnover or annual balance sheet total does not exceed 10 million euro

to impede auditors' independence. Hence, several non-audit services can no longer be performed by a statutory auditor, as enacted in the US Sarbanes-Oxley Act and European Commission Recommendation (2002/590/EC). This EC Recommendation will also be adopted in the UK in its entirety (Beattie and Fearnley, 2002).

Empirical studies concerning the compromise of auditor independence by the provision of non-audit services provide mixed results. Although some studies do not find it to be detrimental for earnings quality (e.g. Ashbaugh et al., 2003; Ruddock, et al., 2004), other studies do find a negative relationship between the provision of non-audit services and earnings quality (e.g. Gore et al., 2001; Frankel et al., 2002; Ferguson et al., 2004). However, neither the Sarbanes-Oxley Act nor the EU Recommendation prohibits statutory auditors to provide tax advice. Also IFAC (International Federation of Accountants) and the UK Institutes of Chartered Accountants (ICAEW and ICAS) do not consider the preparation and compliance of corporate taxation to impede auditor's independence. The ICAEW, though, does impose auditors to be cautious in providing tax advice to their audit clients, in that threats and safeguards of each case should be considered before proceeding (Beattie and Fearnley, 2002). Since tax authorities provide an implicit pressure to conform tax accounting and financial accounting methods (e.g. Shackelford and Shevlin, 2001), acquiring the advice of an auditor concerning tax matters might be desirable.

Previous studies generally use the dichotomous Big 4/non-Big 4 audit variable to capture audit quality differences. In this respect, larger audit firms are expected to be less likely to perform low-quality audits because these firms have more to lose in terms of clients and audit fees in case of an audit failure (DeAngelo, 1981). We use the extent in which earnings management is constrained as a measure of audit quality. Tax incentives are considered to play a large role in private firms' earnings management behavior, even in low tax alignment countries. As certain individuals and firms avoid taxes, the government has to increase tax rates to obtain sufficient income. Tax avoidance causes wealth transfers and imposes costs on society. Accordingly, society requires that a high quality auditor also constrains tax-induced earnings management. As Big 4 auditors are considered to provide a higher audit quality compared to non-Big 4 auditors, we would also expect Big 4 auditors to do a better job in constraining tax-induced earnings management.

However, previous research for listed firms has shown that Big 4 auditors only provide a larger constraint on earnings management, compared to non-Big 4

auditors, when incentives for audit firms to provide a high quality audit are strong (Jeong and Rho, 2004; Khurana and Raman, 2004; Francis and Wang, 2006; Maijoor and Vanstraelen, 2006). For non-listed firms, Van Tendeloo and Vanstraelen (2006) find that audit quality differentiation between Big 4 and non-Big 4 audit firms only exists in high tax alignment countries. In high tax alignment countries, financial statements are taken as the basis for taxation and tax authorities are therefore a direct stakeholder and user of financial statements. In low tax alignment countries, financial statements and tax returns are more considered to be two separate items, with the auditor only being responsible for the former. Accordingly, the probability of audit failure detection, which will negatively affect auditor reputation, is lower. Big 4 auditors are therefore expected to have lower incentives to supply a high quality audit to their private client firms in low tax-alignment countries. Moreover, tax-induced earnings management could be considered to be more transparent and beneficial to all stakeholders other than the tax authorities (and therefore society in general), contrary to otherwise motivated forms of earnings management. As a consequence, Big 4 auditors could be more inclined to allow this type of earnings management as it is considered to be less detrimental. We could therefore expect that Big 4 auditors do not provide a constraint on tax-induced earnings management in a low tax alignment country.

What is more, the provision of both audit services and tax advisory services might lead auditors to help their clients in their tax planning, hereby encouraging tax-motivated earnings management. Because Big 4 auditors are considered to obtain a higher expertise compared to other auditors, one could expect that Big 4 auditors enhance tax-induced earnings management. In this respect, Sikka and Hampton (2006) provide some evidence of UK audit firms selling tax avoidance schemes to their clients. Further, Janssen et al. (2005), using a sample of large Belgian companies, provide evidence that Big 4 auditor clients on average have lower effective tax rates compared to non-Big 4 audited firms.

Hence, we expect that Big 4 auditors enhance tax-motivated earnings management in UK private firms. This leads us to the following hypothesis, stated in alternative form:

Hypothesis: Private UK firms engage more in tax-induced earnings management when audited by a Big 4 auditor compared to a non-Big 4 auditor.

### 3. Research Design

#### 3.1 Measuring Tax-Induced Earnings Management

##### 3.1.1 Income Decreasing Earnings Management

As a first measure to capture tax-induced earnings management, we focus on income decreasing discretionary accruals. Following Dechow et al. (1995), we compute accruals as  $(\Delta \text{ total current assets} - \Delta \text{ cash}) - (\Delta \text{ total current liabilities} - \Delta \text{ short term debt}) - \text{depreciation expense}$ , where  $\Delta$  denotes the yearly change. Since only total accruals are known, discretionary accruals have to be estimated. Several models have been developed for this purpose. A good overview is provided by Dechow et al. (1995), Healy and Wahlen (1999), Young (1999) and McNichols (2000). Discretionary accruals are defined as actual total reported accruals less expected normal accruals. We use the cross-sectional Jones model (DeFond and Jiambalvo, 1994) to estimate discretionary accruals by year and industry. Subgroups all have a minimum of six observations. Specifically, discretionary accruals (DACC) are estimated as the residuals of the following regression equation:

$$ACC_t = \alpha_0 (1/A_{t-1}) + \alpha_1 \Delta REV_t + \alpha_2 GPPE_t + \mu$$

where:

$ACC_t$  = Accruals in year t, scaled by lagged total assets, where accruals equal the year-to-year change in non-cash current assets minus current liabilities (excluding short-term debt), minus depreciation;

$A_{t-1}$  = Total assets in year t-1 or lagged total assets;

$\Delta REV_t$  = Change in revenues in year t, scaled by lagged total assets;

$GPPE_t$  = Gross property, plant and equipment in year t, scaled by lagged total assets.

Negative discretionary accruals are taken as dependent variable of our earnings management model. A dichotomous variable is used to indicate whether the company has a Big 4 auditor (B4) or not. To control for differences in earnings management incentives and firm characteristics that are systematically associated with accruals, we include the following control variables. First, operating cash flow (OPCF), is included to control for firm performance, which is expected to have an influence on the level of accruals (e.g. Dechow et al., 1995). We also we include the natural logarithm of total assets (LNASSETS) to proxy for the size of a company, as prior research suggests an association with the level of accruals or earnings management (e.g. Watts and Zimmerman, 1990; Young, 1999). We further include leverage (LEV), calculated as the ratio of total liabilities to total assets. Highly leveraged firms may have incentives to engage in income increasing earnings management to avoid debt covenant violations (DeFond and Jiambalvo, 1994). On the other hand, financially distressed firms may have incentives for income decreasing earnings management in view of contractual renegotiations (Becker et al., 1998). Finally, we include a vector of industry dummies (IND) to control for industry effects on earnings management. Similar to Burgstahler et al. (2006), the industry classification is based on Campbell (1996) and is illustrated in Table 1.

- INSERT TABLE 1-

Hence, our empirical model then looks as follows:

$$DACC = \beta_0 + \beta_1 B4 + \beta_2 OPCF_t + \beta_3 LNASSETS_t + \beta_4 LEV_t + \beta_5 IND + \varepsilon \text{ (Model 1)}$$

where:

*Dependent variable*

DACC = Negative discretionary accruals in year t, scaled by lagged total assets

*Independent variables*

B4 = Dummy variable (Company has a Big 4 auditor = 1, else = 0)

OPCF<sub>t</sub> = Operating cash flow, computed as operating income minus accruals, scaled by lagged total assets

LNASSETS<sub>t</sub> = Natural logarithm of total assets in year t

$LEV_t$  = Ratio of total liabilities to total assets in year t  
 $IND$  = Vector of industry dummies based on Campbell (1996), as illustrated in Table 1. Campbell 1 (Agriculture and Forestry) is the industry of reference.

As a robustness check, we also perform our analysis on income decreasing earnings management using total accruals and discretionary accruals estimated using the modified Jones model, as proposed by Dechow et al. (1995). The correction to the Jones model, involves subtracting the change in receivables from the change in revenues<sup>3</sup>.

### 3.1.3 Effective Tax Rates

As a second measure of the extent to which Big 4 auditors help private clients in their tax planning, we examine the effective tax rates (ETRs) of companies with a Big 4 auditor compared to a non-Big 4 auditor. A firm's ETR is computed as the tax expense<sup>4</sup> divided by the current pre-tax income. This definition is widely used in the literature (e.g. Gupta and Newberry, 1997; Buijink et al., 2002; Rego, 2003). ETRs reflect the relative tax burden across firms and hence, capture a firm's proficiency to reduce its current tax burden relative to its pre-tax result (Rego, 2003). Tax-induced earnings management is expected to reduce a firm's ETR (see appendix). But apart from managing earnings, firms can also use tax facilities outside earnings to reduce

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<sup>3</sup> Dechow et al. (1995) proposed this correction in a time-series setting. Assuming that revenues are not managed in the estimation period but that all changes in accounts receivable in the event year represent earnings management, the correction is only applied in the event sample. Thus the estimated parameters from the Jones model in the estimation sample are used to estimate discretionary accruals using the adjusted Jones model in the event year. As a number of other studies we apply the correction in the estimation sample, assuming that all changes in accounts receivable arise from earnings management, also in the estimation period/sample (e.g. Kothari et al., 2005).

<sup>4</sup> The tax expense includes both current taxes and deferred taxes. The information provided in the Amadeus database does not allow us to distinguish current and deferred taxes. Hence, our measured ETRs differ only from the STR in the presence of permanent differences. However, we assume temporary differences to be limited in UK private firms because of two reasons. First, as Guenther et al. (1997) argue, even if different accrual methods are used for tax and financial statement purposes, it is quite difficult to defer taxable income without deferring financial statement income" as well as "accelerate financial statement income without also accelerating taxable income" (Guenther et al., 1997, p. 232). Second, because of additional costs of keeping two separate sets of books and because private firms face less of a trade-off if they manage earnings to minimize taxes but hereby make earnings less informative (Ball and Shivakumar, 2005). Moreover, income-decreasing earnings management can be expected to be performed in a book-tax conforming manner, as shown by Badertscher et al. (2006).

the tax base<sup>5</sup>. UK firms can for instance lower their tax base without influencing earnings through carry-forward or backward of losses into the current fiscal year<sup>6</sup>. So actually the ETR captures a broader range of tax management than solely tax-induced earnings management.

However, as income-decreasing earnings management might increase the effective tax rate while reducing taxes when a firm's ETR is larger than its statutory tax rate (STR) (see appendix), we also perform our analysis including only those ETRs that are smaller than the STR. In the UK the STR was 31% in 1998 and 30% in the period of 1999 to 2002 (Devereux et al., 2002). Therefore, the adjusted dependent variable (ETR<STR) contains firm-year observations for which the ETR is smaller than 31% in 1998 and 30% for the rest of the period.

A dichotomous variable is used to indicate whether the company has a Big 4 auditor (B4) or not. To control for differences in firm characteristics that are systematically associated with the ETR, we first control for a firm's pre-tax profitability (PTI), measured as (bottom-line reported income + tax expense)/lagged total assets. Similar to Wilkie and Limberg (1993) and Gupta and Newberry (1997) we expect a positive relation between a firm's ETR and its pre-tax income. Rego (2003), on the other hand, finds a negative relation in a sample of US multinational firms and explains this finding by the fact that firms with larger pre-tax income have larger incentives and resources to engage in tax planning. In addition, size is expected to be related to a firm's ETR, although the direction of this relation is priori unclear. Consistent with the political cost hypothesis, larger firms are expected to face higher tax costs due to their higher visibility and public scrutiny, as shown in a study by Zimmerman (1983). Other studies, however, found mixed results (e.g. Stickney and McGee, 1982) or an inverse relation. Further, prior research has shown that a highly leveraged capital structure and a more capital intensive asset mix are negatively correlated with a firm's ETR (Stickney and McGee, 1982; Gupta and Newberry, 1997) and that ETRs vary significantly across industries (Gupta and Newberry, 1997; Gramlich et al., 2004). We therefore include the natural logarithm of total assets (LNASSETS) to control for firm size, leverage (LEV), calculated as the ratio of total

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<sup>5</sup> The tax base is the same as taxable income. This is the earnings figure which is actually taxed by the tax authorities. The taxes a firm has to pay is calculated as the tax base or taxable income times the statutory tax rate (STR).

<sup>6</sup> UK companies can carry losses forward indefinitely, while losses can be carried back for one year. (PricewaterhouseCoopers, 2004) Financial statement data, however, does not allow us to acquire this kind of information.

liabilities to total assets, capital intensity (CI) measured as the ratio of Gross Property Plant and Equipment to total assets and a vector of industry dummies (IND) as additional control variables. Hence our second empirical model looks as follows:

$$ETR_t = \beta_0 + \beta_1 B4 + \beta_2 PTI_t + \beta_3 LNASSETS_t + \beta_4 LEV_t + \beta_5 CI_t + \beta_6 IND + \varepsilon \quad (\text{Model 2})$$

Where

*Dependent variable*

$ETR_t$  = Effective tax rate (tax expense /pre-tax income)

*Independent variables*

$PTI_t$  = Pre-Tax Income or (bottom-line reported income + tax expense)/lagged total assets

$CI_t$  = Ratio of Gross Property plant and Equipment to total assets

All other variables as previously specified.

### 3.2 Sample

We use the August 2003 version of the Amadeus Top 250 000 database to collect our data<sup>7</sup>. Amadeus is a relatively new database which provides standardized financial statement data. We focus our analysis on a five-year period from 1998 to 2002. The initial sample consists of all UK privately held companies that are required by law to have their financial statements audited and for which financial data and audit firm data are available in the Amadeus database. Consistent with previous research, we exclude banks, insurance companies and other financial holdings (SIC codes between 6000 and 6799), public administrative institutions (SIC code 43 and SIC codes above 90000) as well as privately held subsidiaries of quoted companies as indicated in Amadeus<sup>8</sup>. Further, accruals, operating cash flow, size and leverage are truncated at the 0.5<sup>th</sup> and 99.5<sup>th</sup> percentile to eliminate extreme outliers. For model 1 we further require negative (discretionary) accruals. This leads us to 8673 observations when considering discretionary accruals estimated using the Jones

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<sup>7</sup> Listing status and audit firm data is provided in Amadeus only for the final year. Therefore, previous versions of the Amadeus database were used to verify the listing status and audit firm data.

<sup>8</sup> Financial institutions are excluded because of their specific accounting requirements, which differ substantially from those of industrial and commercial companies. Public administrative institutions are excluded because of their specific nature. Management and financial reporting decisions of subsidiaries of quoted companies are likely to be influenced by public parent companies.

model, 9586 observations for total reported accruals and 8706 observations when using discretionary accruals estimated using the modified Jones model. For model 2 we further exclude observations with a negative ETR or ETR larger than 1. This leads us to 14,245 observations for model 2. When we only consider effective tax rates that are smaller than the statutory tax rate we obtain 8376 observations.

## **4. Results**

### *4.1 Descriptive Statistics and Univariate Results*

Table 2 provides descriptive statistics and univariate results of the different dependent variables included in our analysis. Descriptive statistics are presented for the sample as a whole as well as for subgroups based on auditor quality. With respect to accruals, descriptive statistics are reported for discretionary accruals estimated by the Jones model as well as for total reported accruals and discretionary accruals estimated by the modified Jones model. Hence, it appears that private UK firms with a Big 4 auditor report on average more negative (discretionary) accruals compared to firms with a non-Big 4 auditor. Hence, univariate results seem to indicate that private UK companies with a Big 4 auditor report significantly more income decreasing (discretionary) accruals. While the median ETR appears to be higher for companies with a Big 4 auditor, the difference is not significant. Companies with a Big 4 auditor, however, do have a significantly lower mean ETR. When we only take effective tax rates that are lower than the statutory tax rate into consideration, both mean and median ETRs are significantly lower for companies with a Big 4 auditor. These results could be interpreted as a first indication that Big 4 auditors help their clients engage in tax- induced earnings management.

- INSERT TABLE 2-

Descriptive statistics of the control variables, as presented in Table 3, indicate that companies with a Big 4 auditor have on average significantly lower operating cash flows compared to non-Big 4 auditors, although this is not the case with respect to operating cash flow medians. Further, companies with a Big 4 auditor appear to be larger and more highly leveraged and have a more capital intensive asset mix. In

addition, mean values of pre-tax income are lower for companies with a Big 4 auditor. The median value of pre-tax income is, however, significantly larger for companies with a Big 4 auditor. When we only include those firm-year observations for which the ETR is smaller than the STR (not reported), both mean and median values of PTI are smaller for companies with a Big 4 auditor compared to companies with a non-Big 4 auditor.

- INSERT TABLE 3-

#### *4.2 Multivariate Results*

Regression results are presented in Table 4. In column A results are provided for negative discretionary accruals estimated by the Jones model. As there is quite a lot of criticism on the different available ways to measure earnings management, we also report, as a robustness check, results for negative total accruals (column B) and negative discretionary accruals estimated by the modified Jones model (column C). As shown in Table 4, the coefficient on the Big 4 variable is significantly negative. This result holds for every alternative dependent variable. These results indicate that private UK companies engage significantly more in income decreasing earnings management when they have a Big 4 auditor compared to a non-Big 4 auditor. Further, regression results show significant coefficients on all control variables.

- INSERT TABLE 4-

Table 5 presents regression results on the effective tax rates. Column A presents the results for the sample as a whole, while in column B, results are presented only for those firm-year observations with effective tax rates lower than the statutory tax rate in a given year. As mentioned, in the UK the statutory tax rate was 31% for 1998 and 30% for the rest of the sample period. In both cases, private companies with a Big 4 auditor have a significantly lower ETR compared to companies with a non-Big 4 auditor. Moreover, all control variables are significant, except for size (lnassets), which is not significant when considering ETRs smaller than the STR. The explanatory power of the model is, however, much higher when we only take ETRs that are smaller than the STR into account.

- INSERT TABLE 5-

### *4.3 Sensitivity Analyses*

To check the robustness of our results, we perform a number of additional sensitivity analyses (results not reported). As a first sensitivity check, to calculate discretionary accruals, we included current return on assets in the (modified) Jones models to control for extreme performance (e.g. Kothari et al. 2005). Results were qualitatively similar.

Second, we perform our regression analysis using Tobit regressions. Since we only take income decreasing (negative) discretionary accruals into account in model 1 and positive ETRs in model 2, our sample is truncated for both models, requiring Tobit regressions (e.g. Greene, 2000; Wooldridge, 2003). Since Tobit regressions require positive dependent variables, we now take the absolute value of income decreasing discretionary accruals as dependent variable of model 1. Results are similar to the OLS-regressions for both models, indicating that our results are not influenced by the truncation of the dependent variable.

Third, there is some concern regarding the use of ETR as a measure for the relative tax burden of a company, as earnings management might blur this measure (Rego, 1999). However, as previously explained and shown in the appendix, when only taking the ETRs that are smaller than the STR into account, we make sure that income decreasing earnings management results in a smaller ETR, which is consistent with our interpretation of lower ETRs representing more tax avoidance. Nevertheless, we have also performed our analysis with an alternative ETR measure, ETR2, relating tax expense to operating cash flow. Again we eliminate ETRs that are negative or larger than 1. ETR2 is, however, severely influenced by truncation, requiring the use of Tobit regressions. Results are qualitatively similar.

Fourth, since we rely on pooled cross-sectional data, residuals may be correlated across observations on different firms in the same year or across observations on the same firms in different years, which would lead to an underestimation of the (White adjusted) OLS standard errors (Petersen, 2006). To control for the former, we have included year-dummies in the OLS analysis to account for time fixed effects. This provides similar results. To control for the latter,

we have performed a random effects analysis with clustered standard errors, including year dummies. Again, results are qualitatively similar.

Finally, we attempt to control for self-selection bias. The results of Chaney et al. (2004) indicate that certain private firm-specific characteristics that influence financial reporting, and more specifically earnings management behavior, might also influence auditor choice. If data can be collected on these factors influencing both auditor choice and earnings management, we can include them in the regression analysis to alleviate the problem (Wooldridge, 2003). We have therefore included some additional control variables in the earnings management regressions. In this respect, we have additionally included capital intensity, measured as the ratio of fixed assets to total assets and asset turnover or operating revenue divided by lagged total assets in an attempt to control for firm complexity. Further we included the yearly percentage change in sales to control for firm growth. Both firm complexity and firm growth can be expected to influence reported accruals (McNichols, 2002; Young, 1999) but can perhaps also be expected to influence auditor choice (Chaney et al., 2004). Inclusion of these variables, though, does not alter our results.

However, when certain variables that both affect earnings management and auditor choice have not been adequately controlled for in our regression analysis, auditor choice (Big 4/non-Big 4) would be endogenous in our analysis, hereby possibly confounding our results (e.g. Heckman, 1978). The existence of an endogeneity problem can be tested by performing the extended regression version of the Hausman specification test (Maddala, 2001, p. 498; Wooldridge, 2003, p.506). In particular, a self-selection model is estimated where auditor choice is explained by all the exogenous variables in the earnings management model. The effect of any omitted variables influencing auditor choice is now captured in the residual of the auditor choice-model. When we include this residual in the earnings management model and the coefficient on this residual is statistically significant, then the model is considered to suffer from an endogeneity bias caused by omitted variables influencing both earnings management and auditor choice. Alternatively, we can include the inverse Mills ratio to address a possible self-selection problem. The inverse Mills ratio is obtained from a first stage Probit model, where auditor choice is explained by all the exogenous variables in the earnings management model, as described by Maddala (1983) and Greene (2000). Including the first stage residual or inverse Mills ratio causes both of these variables and the B4 variable to become insignificant. The reason

for this is that B4 and the residual or inverse Mills ratio are highly correlated (Wooldridge, 2002 and 2003). Because auditor choice is dichotomous, it is not necessary for identification purposes to include in the self-selection model an instrument or exogenous variable which is not included in the earnings management model. However, to avoid multicollinearity these instruments are necessary (Wooldridge, 2002). We are however unable to find an adequate variable that is expected to influence auditor choice without having an effect on accruals or earnings management.

## **5. Conclusion**

Tax incentives are considered to play a large role in private firms' earnings management behavior. Also in countries with a low alignment between financial reporting and tax accounting, tax-induced earnings management is likely to occur, especially in private firms.

As tax avoidance causes wealth transfers and imposes costs on society, society requires that a high quality or Big 4 auditor constrains tax-induced earnings management. On the other hand, Big 4 auditors could be more inclined to allow tax-induced earnings management, as it could be considered to be more transparent and beneficial to all stakeholders other than the tax authorities (and therefore society in general). Moreover, auditors are allowed to provide tax advice to their clients, which could induce them to help their clients in their tax planning. Because Big 4 auditors are considered to obtain a higher expertise compared to other auditors, one could expect Big 4 auditors to enhance tax-motivated earnings management. This study investigates to what extent Big 4 auditors enhance tax-motivated earnings management in UK private firms, a country with a weak alignment between financial reporting and tax accounting.

Our results provide evidence that UK private companies engage more in income-decreasing earnings management and have on average lower effective tax rates when they have a Big 4 auditor compared to a non-Big 4 auditor. These results suggest that Big 4 auditors help their clients to avoid paying taxes. Our findings contribute to the current debate on financial reporting quality and auditor independence. While current regulation allows auditors to provide tax advice to their

clients, tax avoidance imposes costs on society and undermines the social infrastructure.

Our findings are subject to following limitations. First, although we have controlled for various earnings management incentives, we are aware that there may be other incentives that have not been controlled for. Second, as in other earnings management studies, we acknowledge that earnings management is difficult to measure. Moreover, while tax incentives can be expected to play a major role in private companies' earnings management behavior, other incentives might also cause companies to engage in income-decreasing earnings management. However, as a company's tax base and taxes paid are not directly observable from the financial statements, it is not possible to adequately measure tax incentives. Future research is warranted to study in more detail firms' strategies and tactics to manage earnings in order to avoid taxes.

## Appendix

In what follows, we will show that income decreasing earnings management will increase the (effective tax rate) ETR when the ETR is larger than the statutory tax rate (STR). When the ETR is smaller than the STR income decreasing earnings management will decrease the ETR. Since we interpret observations with lower ETRs as engaging more in tax avoidance, we will additionally perform our analysis on the relative tax burdens of firms using only those ETRs that are smaller than the STR.

Income decreasing earnings management, or reducing pre-tax income (PTI), will reduce current tax expense. However, whether income-decreasing earnings management increases or decreases a firm's ETR depends on its tax facilities outside earnings. The current tax expense is equal to a firm's taxable income or tax base times the STR. The difference between taxable income and book income (PTI) is equal to the firm's tax facilities (TF)<sup>9</sup>. Hence, taxable income is equal to PTI + TF and taxes can be reduced by income decreasing earnings management, i.e. decreasing PTI, and/or making optimal use of tax facilities, i.e. making TF as negative as possible. ETR can be written as

$$ETR = \frac{STR \times (PTI + TF)}{PTI}$$

When TF is positive, taxable income is larger than PTI and the ETR is larger than the STR. For example, while the writing down allowance for motor cars is calculated at 25%, the writing down amount is restricted for each car (PricewaterhouseCoopers, 2004). Having a writing down allowance that exceeds that amount causes the tax base to be larger than book income and accordingly, would cause the ETR to exceed the STR. A negative TF causes the ETR to be lower than the STR, and can for instance be achieved through carry-forward or backward of losses into the current fiscal year. Whether income decreasing earnings management

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<sup>9</sup> Note that normally TF includes both temporary and permanent differences between book and taxable income. However, because Amadeus does not allow us to distinguish current and deferred tax expenses, our measured ETRs differ only from STR in the presence of permanent differences. Hence, TF only includes permanent differences. As previously mentioned, however, we assume temporary differences to be limited in UK private firms (see footnote 4).

decreases or increases the ETR depends on the sign of TF. That is, the first order derivative of ETR on PTI is equal to

$$\frac{d \text{ ETR}}{d \text{ PTI}} = - \frac{\text{STR} \times \text{TF}}{\text{PTI}^2}$$

Consequently, when TF is positive (i.e. the ETR is larger than the STR), reducing PTI increases ETR. When TF is negative (i.e. the ETR is smaller than the STR), reducing PTI decreases ETR. For example, suppose a company has a PTI of 100, including a writing down allowance that exceeds the tax restriction on this allowance by 20. When the STR is 30%, this company has to pay 36 in taxes (30% x 120) and has an ETR of 36% (36/100). When this firm engages in income decreasing earnings management and hereby reduces its PTI to 90, it will have to pay 33 in taxes (30% x 110) but the ETR is now 36,67% (33/90). On the other hand, suppose we have a company with a PTI of 100, which can rely on a carry forward loss of 20. This company has to pay 24 in taxes (30% x 80) and has an ETR of 24% (24/100). When this company reduces its PTI to 90, it would have to pay 21 in taxes (30% x 70) and have an ETR of 23,33% (21/90).

Hence, as income decreasing earnings management will increase the ETR when the ETR is larger than the STR, while reducing taxes, including ETRs that are larger than the STR might lead to spurious interpretations since we consider having a lower ETR as engaging more in tax avoidance. Therefore, we will additionally perform our analysis on the relative tax burdens of firms using only those ETRs that are smaller than the STR.

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**Table 1**  
**Industry Classification**

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<b>No</b>	<b>Industry group</b>	<b>SIC-code</b>
1	Agriculture and Forestry	2, 7-9
2	Petroleum industry	13, 29
3	Consumer durables	25,30,36-37, 39,50, 55, 57
4	Basic industry	10, 12, 14, 24, 26, 28, 33
5	Food/tobacco	1, 20, 21, 54
6	Construction	15-17, 32, 52
7	Capital goods	34-35, 38
8	Transportation	40-42, 44, 45, 47
9	Utilities	46, 48, 49
10	Textiles/ trade	22-23, 31, 51, 53, 56, 59
11	Service	72-73, 75, 76,80, 81, 82, 83, 84, 86-88, 89
12	Leisure	27, 58, 70, 78-79

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**Table 2**  
**Descriptive Statistics and Univariate Analysis of Dependent Variables**

		N	Min	Percentile 25	Median	Percentile 75	Max	Mean	STD
<b>DACC</b>	pooled	8673	-0.874	-0.152	-0.080	-0.036	0.000	-0.113	0.110
	B4	4067	-0.874	-0.156	-0.082	-0.037	0.000	-0.117	0.115
	NB4	4606	-0.864	-0.147	-0.078	-0.036	0.000	-0.109	0.105
<i>Difference</i>					-2.189***			-3.129***	
<b>ACC</b>	pooled	9586	-0.759	-0.158	-0.085	-0.040	0.000	-0.117	0.111
	B4	4560	-0.759	-0.161	-0.087	-0.041	0.000	-0.120	0.114
	NB4	5026	-0.758	-0.154	-0.084	-0.040	0.000	-0.115	0.107
<i>Difference</i>					-1.629			-2.344**	
<b>DACC2</b>	pooled	8706	-0.829	-0.151	-0.080	-0.037	0.000	-0.113	0.110
	B4	4076	-0.821	-0.156	-0.083	-0.038	0.000	-0.117	0.115
	NB4	4630	-0.829	-0.148	-0.079	-0.036	0.000	-0.109	0.105
<i>Difference</i>					-2.391**			-3.330***	
<b>ETR</b>	pooled	14245	0.000	0.159	0.284	0.325	1.000	0.253	0.164
	B4	6615	0.000	0.107	0.289	0.328	1.000	0.249	0.176
	NB4	7630	0.000	0.189	0.280	0.322	1.000	0.257	0.152
<i>Difference</i>					-0.727			-3.058***	
<b>ETR&lt;STR</b>	pooled	8376	0.000	0.020	0.197	0.265	0.310	0.176	0.113
	B4	3726	0.000	0.000	0.149	0.259	0.310	0.139	0.118
	NB4	4650	0.000	0.083	0.211	0.269	0.310	0.176	0.107
<i>Difference</i>					-12.766***			-14.891***	

This table presents descriptive statistics of the alternative dependent variable for the sample as a whole and for different subgroups based on auditor quality. Descriptive statistics include the number of firm-year observations (N), the minimum value (Min), the 25<sup>th</sup> percentile, the median, 75<sup>th</sup> percentile, the maximum value (Max), the mean, and the standard deviation (STD). DACC are negative discretionary accruals as estimated by the Jones model (and therefore scaled by lagged total assets). ACC are negative reported accruals, scaled by lagged total assets. DACC2 are negative discretionary accruals as estimated by the modified Jones model (and therefore scaled by lagged total assets). ETR is the effective tax rate calculated as tax expense divided by pre-tax income. ETR<STR is the effective tax rate that is smaller than the statutory tax rate (STR) of 31% in 1998 and 30% in all other years. The fact that the maximum ETR is exactly 31% is due to rounding. Further, test-statistics on differences in mean (t-statistic) and median (Z-statistic Wilcoxon Mann-Whitney) values of the different dependent variables are reported. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05 and 0.01 level respectively (two-tailed).

**Table 3**  
**Descriptive Statistics and Univariate Analysis of Control Variables**

		N	Min	Percentile 25	Median	Percentile 75	Max	Mean	STD
<b>OPCF</b>	pooled	14245	-1.555	0.003	0.098	0.200	1.002	0.100	0.211
	B4	6615	-1.555	-0.002	0.099	0.204	0.999	0.094	0.228
	NB4	7630	-1.146	0.008	0.097	0.198	1.002	0.105	0.196
<i>Difference</i>					-0.783			-3.092***	
<b>LNASSETS</b>	pooled	14245	7.290	8.928	9.470	10.164	12.766	9.606	0.976
	B4	6615	7.313	9.302	9.902	10.630	12.766	10.061	1.005
	NB4	7630	7.290	8.698	9.198	9.695	12.748	9.250	0.795
<i>Difference</i>					-46.594***			49.911***	
<b>LEV</b>	pooled	14245	0.077	0.540	0.709	0.853	1.798	0.694	0.238
	B4	6615	0.077	0.532	0.715	0.871	1.797	0.705	0.257
	NB4	7630	0.083	0.549	0.705	0.841	1.798	0.684	0.220
<i>Difference</i>					-3.723***			4.971***	
<b>PTI</b>	pooled	14245	-0.834	0.019	0.064	0.134	1.271	0.082	0.138
	B4	6615	-0.834	0.011	0.065	0.142	1.271	0.078	0.153
	NB4	7630	-0.694	0.023	0.063	0.126	1.164	0.085	0.125
<i>Difference</i>					-1.719*			-2.796***	
<b>CI</b>	pooled	14245	0.000	0.093	0.238	0.445	0.999	0.299	0.249
	B4	6615	0.000	0.099	0.252	0.454	0.999	0.307	0.249
	NB4	7630	0.000	0.089	0.224	0.437	0.994	0.293	0.248
<i>Difference</i>					-3.780***			3.341***	

This table presents descriptive statistics of the control variables for the sample as a whole and for different subgroups based on auditor quality. Descriptive statistics on the control variables are based on the largest sample (14245 observations) and include the number of firm-year observations (N), the minimum value (Min), the 25<sup>th</sup> percentile, the median, 75<sup>th</sup> percentile, the maximum value (Max), the mean, and the standard deviation (STD). OPCF is the operating cash flow, computed as operating income minus accruals, scaled by lagged total assets. LNASSETS is a size measure, computed as the natural logarithm of total assets. LEV is the ratio of total liabilities to total assets. PTI is pre-tax income or (bottom-line reported income + current tax expense), scaled by lagged total assets. CI indicates a firm's capital intensity and is computed as the ratio of gross property plant and equipment to total assets. Further, test-statistics on differences in mean (t-statistic) and median (Z-statistic Wilcoxon Mann-Whitney) values of the different control variables are reported. \*, \*\*, \*\*\* indicate statistical significance at the 0.10, 0.05 and 0.01 level respectively (two-tailed).

**Table 4**  
**Regressions on Income Decreasing Earnings Management**

$$(D)ACC = \beta_0 + \beta_1 B4 + \beta_2 OPCF_t + \beta_3 LNASSETS_t + \beta_4 LEV_t + \beta_5 IND + \varepsilon$$

Variables	A DACC (Jones) Coefficient (t-statistic)	B ACC Coefficient (t-statistic)	C DACC2 (Modified Jones) Coefficient (t-statistic)
Intercept	-0.024 (-1.168)	-0.027 (-1.827)*	-0.024 (-1.169)
B4	-0.007 (-3.606)***	-0.006 (-3.062)***	-0.008 (-3.826)***
OPCF	-0.410 (-35.681)***	-0.421 (-37.596)***	-0.406 (-35.710)***
LNASSETS	0.002 (1.682)*	0.003 (2.517)**	0.002 (1.995)**
LEV	-0.094 (-20.988)***	-0.089 (-21.072)***	-0.091 (-20.517)***
IND	Included	Included	Included
N	8673	9586	8706
R <sup>2</sup> (Adjusted)	0.434	0.438	0.428
F	444.232***	499.976***	436.350***

The table reports OLS coefficients with t-statistics based on heteroskedastic-consistent standard errors. \*, \*\*, \*\*\* indicates statistical significance at the 0.10, 0.05 and 0.01 level respectively (two-tailed). DACC are negative discretionary accruals as estimated by the Jones model (and therefore scaled by lagged total assets). ACC are negative total accruals, scaled by lagged total assets. DACC2 are negative discretionary accruals as estimated by the modified Jones model (and therefore scaled by lagged total assets). B4 is a dichotomous variable indicating whether the company has a Big 4 auditor or not. OPCF is the operating cash flow, computed as operating income minus accruals, scaled by lagged total assets. LNASSETS is a size measure, computed as the natural logarithm of total assets. LEV is the ratio of total liabilities to total assets. Industry dummies, with Campbell 1 as industry of reference, are included but not reported.

**Table 5**  
**Regressions on ETR (Model 2)**

$$ETR_t = \beta_0 + \beta_1 B4 + \beta_2 PTI_t + \beta_3 LNASSETS_t + \beta_4 LEV_t + \beta_5 CI_t + \beta_6 IND + \varepsilon$$

Variables	A	B
	ETR Coefficient (t-statistic)	ETR<STR Coefficient (t-statistic)
Intercept	0.210 (7.576)***	0.243 (12.478)***
B4	-0.011 (3.619)***	-0.026 (-9.860)***
PTI	0.205 (20.528)***	0.242 (22.949)***
LNASSETS	0.009 (5.309)***	0.000 (0.230)
LEV	-0.044 (-6.910)***	-0.073 (-14.190)***
CI	-0.043 (-6.476)***	-0.039 (-7.486)***
IND	Included	Included
N	14245	8376
R <sup>2</sup> (Adjusted)	0.053	0.203
F	51.090***	134.284***

The table reports OLS coefficients with t-statistics based on heteroskedastic-consistent standard errors. \*, \*\*, \*\*\* indicates statistical significance at the 0.10, 0.05 and 0.01 level respectively (two-tailed). ETR is the effective tax rate calculated as tax expense divided by pre-tax income. ETR is the effective tax rate calculated as tax expense divided by pre-tax income. ETR<STR is the effective tax rate that is smaller than the statutory tax rate (STR) of 31% in 1998 and 30 % in all other years. B4 is a dichotomous variable indicating whether the company has a Big 4 auditor or not. PTI is pre-tax income or (bottom-line reported income + current tax expense), scaled by lagged total assets. LNASSETS is a size measure, computed as the natural logarithm of total assets. LEV is the ratio of total liabilities to total assets. CI indicates a firm's capital intensity and is computed as the ratio of gross property plant and equipment to total assets. Industry dummies, with Campbell 1 as industry of reference, are included but not reported.