Earnings Management and Audit Quality in Europe: Evidence from the Private Client Segment Market

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ABSTRACT This paper contributes to the recent literature on financial reporting quality in private (i.e. non-listed) companies (Ball and Shivakumar, 2005; Burgstahler et al., 2006) by examining whether in these types of companies Big 4 audit firms, as high quality auditors, provide a constraint on earnings management. Considering incentives of auditors to supply a high audit quality in private firms, we expect that Big 4 auditors have an incentive to constrain earnings management only in high tax alignment countries, where financial statements are more scrutinized by tax authorities and the probability that an audit failure is detected is higher. Using data on private firms in European countries, this study provides evidence consistent with this expectation.

1. Introduction

Some recent studies have focused on the demand and supply of financial reporting quality in private (i.e. non-listed) firms, as opposed to the extensively researched financial reporting quality in public (i.e. listed) firms. For example, Burgstahler et al. (2006) find that private firms engage more in earnings management compared to public firms, and Ball and Shivakumar (2005) find that private firms incorporate losses less timely than public firms. This study contributes to this recent literature by examining audit quality in private firms, and by questioning whether audit firm quality enhances financial reporting quality in private firms. In particular, this study examines (1) whether Big 4 audit firms provide a
constraint on earnings management in private firms and (2) to what extent Big 4 audit firms provide a uniform level of audit quality for private companies across countries. Given that private companies constitute the majority of the EU economy and the EU market for audit services, this research seems warranted. Furthermore, although audit quality is mainly considered to be important for listed firms and derived from the agency theory, high quality auditing can also be functional in private firms. For example, it can help to alleviate agency conflicts between owners, managers and banks, and it can be useful for evaluation of managerial performance or for convincing various stakeholders of the credibility of the financial statements.

As earnings management in private firms deprives the users of financial statements of obtaining reliable information, the task of the auditor is to protect stakeholders’ interests. The incentives of (especially large) audit firms to supply a high quality audit are expected to depend upon the probability that an audit failure is detected and the risk of litigation, hereby damaging their reputation. However, since financial statements of private firms, compared to public firms, are not scrutinized as much by investors, financial analysts or regulating authorities of stock exchanges, the probability that an audit failure is detected and the risk of litigation is much lower in privately held companies, even in countries generally considered as stronger in terms of investor protection or legal enforcement (Chaney et al., 2004; Vander Bauwhede and Willekens, 2004).

We argue that for private firms in countries with a high alignment between financial reporting and tax accounting, tax authorities are expected to (partly) take on the role that investors, financial analysts or regulating authorities of stock exchanges have in public firms. In particular we argue that tax authorities in countries with a high tax alignment will scrutinize financial statements more compared to countries with a low tax alignment because the financial statements are taken as the basis for taxation. This results in a higher probability of audit failure detection, which will negatively affect auditor reputation. 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. Because financial statements are less scrutinized, lowering the probability of audit failure detection, one could expect that Big 4 auditors have weaker incentives to supply a high audit quality to their private clients in these countries. Therefore, we expect to observe a Big 4 audit quality effect only in high tax alignment countries, where financial statements are more scrutinized and the probability that an audit failure is detected is higher.

Our sample consists of all private firms in six EU countries (Belgium, Finland, France, the Netherlands, Spain and the UK) during the period 1998–2002 that are required by law to have their financial statements audited and for which both financial data and audit firm data were available in the Amadeus database. Belgium, Finland, France and Spain are considered as high tax alignment countries. The Netherlands and the UK are considered as low tax alignment countries. Consistent with our hypothesis, we find that a Big 4 audit firm constrains earnings
management more compared to a non-Big 4 audit firm only in countries with high tax alignment. Furthermore, consistent with Burgstahler et al. (2006), we find that private companies domiciled in countries with stronger legal systems engage less in earnings management. As expected, audit quality differentiation in private firms is not enhanced in strong legal environments. Further, we show that subdividing non-Big 4 audit firms into second-tier and small audit firms does not support audit quality differentiation between these two types of audit firms. Our results are robust to a number of sensitivity tests.

The remainder of this paper is organized as follows. In Section 2, we review the relevant literature, provide the theoretical background and formulate the research hypotheses. Section 3 describes the research design. The results of the study and sensitivity analyses are presented in Section 4. We conclude in Section 5 with summarizing our results and discussing the implications of our analysis.

2. Previous Literature and Hypothesis Development

2.1. Earnings Management in Private Firms

While numerous studies have investigated earnings quality and its determinants among public firms, only a few studies have considered earnings management in private firms (see Beatty and Harris, 1998; Beatty et al., 2002; Coppens and Peek, 2005; Burgstahler et al., 2006). Private companies are more closely held, have greater managerial ownership, major capital providers often have insider access to corporate information and capital providers take a more active role in management. Moreover, their financial statements are not widely distributed to the public and are more likely to be influenced by tax objectives (Ball and Shivakumar, 2005). Given these unique attributes of private firms as opposed to public firms and the fact that private firms constitute the majority of the EU economy and of the EU market for audit services, studying earnings management and the role of the auditor in private firms is relevant.

The main users of private firms’ financial statements are stakeholders other than equity investors, such as employees, bankers, customers, suppliers and the government. To protect the interests of these stakeholders, private European companies that exceed certain size criteria are required to have their financial statements audited.

To the extent that managers want to ‘mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers’ (Healy and Wahlen, 1999, p. 368) earnings will also be managed in private firms. For example, bank financing is usually a major source of finance in privately held companies, resulting in agency conflicts between bankers and owners, and between bankers and management (Vander Bauwhede and Willekens, 2004), which could also create earnings management incentives. Typical explanations of why private
firms would potentially engage in earnings management are tax minimization and obtaining better terms of trade with banks, suppliers, customers, employees and government (Coppens and Peek, 2005).

Similar to public firms, earnings management in private firms deprives the users of financial statements of obtaining reliable information. As it is the task of the statutory auditor to protect stakeholders’ interests, we question to what extent audit quality constitutes a constraint on earnings management in private firms.

2.2. Audit Quality in Private Firms

All European private companies that meet certain size criteria\(^6\) 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. It could be argued that agency conflicts may be weaker in private firms compared to public firms, because ownership and control are less separated, possibly reducing the demand for financial statements for monitoring managers (Fama and Jensen, 1983) and a high quality audit. However, high quality auditing is also called for in private firms for the following reasons. First, many private firms are subject to agency conflicts when they are not entirely run by owner-managers (Ang \textit{et al.}, 2000) and agency conflicts possibly exist between bankers and owners and bankers and management (Vander Bauwhede and Willekens, 2004). In the absence of market-based measures of firm-value, high quality reporting becomes particularly relevant for evaluation of managerial performance and to support personnel and compensation decisions, resulting in a demand for high quality audits (Chaney \textit{et al.}, 2004). Further, having a Big 4 auditor could also in private firms be used to signal high financial reporting quality. For instance, private firms may choose a Big 4 auditor in order to obtain financing at the lowest possible cost (Beatty, 1989), or in view of the possibility of going public in the future or of being targeted for acquisition (Chaney \textit{et al.}, 2004). Moreover, tax authorities rely on financial statements to determine taxable income especially in countries with a high alignment between financial reporting and tax accounting. Having a high quality auditor could signal financial reporting quality and perhaps deter a rigorous tax audit. And finally, private firms may also want to convince suppliers, clients or employees of the credibility of their financial statements.

From an audit market perspective, audit quality depends on (1) the probability that material misstatements and signals of financial distress are discovered and (2) the probability that the auditor will report these misstatements and signals (DeAngelo, 1981). While the technical capability of auditors or the probability that the auditor will discover material misstatements and going concern breaches is often assumed to be constant across different auditors, audit quality is assumed to be a function of auditor independence. Litigation and disciplinary sanctions are
supposed to prevent auditors from compromising their independence and as such, provide incentives to the auditor to constrain earnings management or issue a qualified opinion when necessary. Apart from the sanctions themselves, litigious actions or disciplinary sanctions damage the auditor’s reputation. 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. Auditor independence is thus considered to relate to the auditor’s reputational capital (DeAngelo, 1981).

However, this reputation rational is only expected to hold when the probability that an audit failure is detected and the risk of litigation is high, hereby damaging the auditor’s reputation. When the risk of audit failure detection and litigation is low, litigation and reputation costs of providing a low quality audit are expected to be reduced, hereby lowering the incentives of large audit firms to supply a high quality audit. As documented in different empirical studies (e.g. Maijoor and Vanstraelen, 2006; Francis and Wang, 2008), Big 4 audit firms are less inclined to supply public client firms with high quality audits in countries with weaker investor protection, lower level of enforcement and lower risk of litigation.

In privately held companies, litigation and reputation costs are likely much lower, even in countries generally considered as stronger in terms of investor protection or legal enforcement since financial statements of private firms are not scrutinized as much by investors, financial analysts or regulating authorities of stock exchanges (Chaney et al., 2004; Vander Bauwhede and Willekens, 2004). As a consequence, we do not expect investor protection or legal enforcement to enhance audit quality differentiation between Big 4 and non-Big 4 auditors with respect to private client firms.

Previous studies concerning audit quality and earnings management in private firms have, to our knowledge, only been performed for the Belgian audit market and provide somewhat mixed results (Vander Bauwhede et al., 2003; Vander Bauwhede and Willekens, 2004). Drawing on DeAngelo’s reputation rational (1981) and the expectation that the incentives of (especially large) auditors to supply a high quality audit depend upon the probability that an audit failure is detected and the risk of litigation, we argue that tax enforcement could enhance audit quality in private firms, in countries with a high alignment between financial reporting and tax accounting. Since in high tax alignment countries financial statements are taken as the basis for taxation and are in fact part of the tax statement, tax authorities are expected to rigorously examine financial statements. In particular, we argue that tax authorities in private firms (partly) take on the role that investors, financial analysts or regulating authorities of stock exchanges have in public firms, in scrutinizing financial statements. Given that financial statements are more likely to be scrutinized, the probability that an audit failure is detected is higher in high tax alignment countries. The auditor, who has to assess the fairness of the financial statements, has as such a direct responsibility to constrain aggressive (tax) accounting practices. As the detection of aggressive tax accounting practices will lead to additional tax expenses, due to
tax income restatements and sanctions of tax authorities, and possibly even court cases. Big 4 auditors, who want to protect their reputation as high quality auditors, are therefore encouraged to constrain earnings management.

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 financial statements. Tax authorities are expected to focus their attention on tax returns. Hence, financial statements are less scrutinized, lowering the probability of audit failure detection. Hence, one could expect Big 4 auditors to have weaker incentives to supply a high audit quality to their private clients in these countries.

Thus, in order to protect their internationally recognized reputation, we expect that Big 4 auditors have an incentive to provide a high quality audit to their private client firms only in high tax alignment countries, where financial statements are more scrutinized by tax authorities and the probability that an audit failure is detected is higher. This is reflected in the following hypothesis, stated in alternative form:

Hypothesis: Private firms engage significantly less in earnings management when audited by a Big 4 auditor compared to a non-Big 4 auditor, only when domiciled in a country with a high alignment between financial reporting and tax accounting.

3. Research Design

3.1. Sample

We use the August 2003 version of the Amadeus Top 250,000 database to collect our data. 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 privately held companies that have their domicile in one of the – at that time – 15 member states of the European Union, 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. Observations of Austria, Germany, Greece, Italy and Sweden had to be excluded because of unavailability of audit firm data. In addition, Portugal is excluded due to insufficient observations for companies with Big 4 auditors. Finally, three countries were excluded because of missing accounting and institutional data. In particular, Ireland and Denmark are excluded because Amadeus does not provide data on depreciation and operating income for Irish companies and cash and short-term debt for Danish companies, and Luxembourg is excluded because of missing institutional data in La Porta et al. (1998, 2006). Hence, the remaining countries are Belgium, Finland, France, the Netherlands, Spain and the UK.

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 9000) as well as privately held subsidiaries of quoted companies as indicated in Amadeus. Further, to eliminate extreme outliers, all accounting items needed to construct the earnings management measures are truncated at the 0.5th and 99.5th percentile.

For our industry–country analysis (see Section 3.2), the above selection criteria result in 64,831 firm-year observations, constituting 144 industry–country observations (6 countries × 12 industry groups × 2 audit firm types). However, we further require a minimum of 10 observations per unit of analysis, resulting in 129 industry–country observations. This number is further reduced to 113 observations due to zero small losses in these eliminated subgroups.

3.2. Earnings Management Proxies

Discretionary accruals and earnings distributions have been heavily criticized as earnings management measures (e.g. Young, 1999; McNichols, 2000; Dechow et al., 2003; Beaver et al., 2004; Durtschi and Easton, 2005). Especially in cross-country studies, accruals models exhibit considerable variation in performance, caused by the international variation in model misspecification problems as well as sample size (Meuwissen et al., 2007). In response to the criticisms, a growing number of studies are relying on an aggregate measure of earnings management behaviour, as developed by Leuz et al. (2003) (e.g. Lang et al., 2003, 2006; Wysocki, 2004; Burgstahler et al., 2006).

This measure is constituted of four different proxies capturing a wide range of earnings management activities: the magnitude of total accruals scaled by operational cash flow; the tendency of firms to avoid small losses; the smoothness of earnings relative to cash flows; and the correlation of accounting accruals and operating cash flow. Averaging various earnings management proxies is expected to mitigate potential measurement error (Leuz et al., 2003).

We draw on Burgstahler et al. (2006), to compute the earnings management proxies, which are calculated at the industry–country level for firms with a high quality auditor vs. firms with a low quality auditor. The magnitude of total accruals relative to operational cash flow (EM1) is computed as the median absolute value of total accruals scaled by the corresponding median absolute value of operational cash flow for each industry–country–audit quality subgroup. The scaling by operating cash flow controls for differences in firm size and performance.

To measure the extent in which firms avoid reporting small losses (EM2), we calculate the ratio of small profits to small losses at the industry–country level for firms with a high quality auditor vs. firms with a low quality auditor. A firm-year observation is classified as a small profit (small loss) if positive (negative) earnings fall within the range of 1% of lagged total assets.

The smoothness of earnings relative to cash flows (EM3) is calculated as the standard deviation of operating income scaled by the standard deviation of
operational cash flow to control for differences in the variability of the firms’ economic performance. The resulting ratio is multiplied by \(-1\) so that higher values correspond to more earnings smoothing. As a second measure of earnings smoothing (EM4), we consider the contemporaneous Spearman correlation between the changes in total accruals and the changes in operational cash flow for each industry–country–audit quality subgroup, multiplied by \(-1\), so that higher values again correspond to more earnings smoothing.\(^{15}\)

Finally, the individual earnings management scores are transformed into percentage ranks (ranging from 0 to 100). The average percentage rank per industry–country–audit quality subgroup constitutes the aggregate earnings management measure (EM\(_{Agg}\)).

3.3. Empirical Model

The dependent variable in our empirical model is the aggregate earnings management measure, described above. Our independent variables of interest are the following. For audit quality differentiation, a dichotomous variable is used indicating whether the company has a Big 4 auditor (B4) or not. To take the extent of tax alignment into account, we include a dichotomous variable TAX. The TAX variable takes on a value of one when financial reporting and tax rules are highly aligned (Belgium, Finland, France and Spain\(^{16}\)) and zero otherwise (the Netherlands and the UK). To examine whether tax alignment has an influence on audit quality, we include an interaction term B4 \(*\) TAX. As we expect private firms to engage significantly less in earnings management when audited by a Big 4 auditor compared to a non-Big 4 auditor only in high tax alignment countries, we expect the coefficient on B4 to be insignificant when including this interaction term, while the interaction effect is expected to be negative. The expected sign of the coefficient on TAX is positive, as prior research has shown that earnings management is more pervasive in high tax alignment countries (Burgstahler et al., 2006).

In addition, a number of control variables are included that are expected to influence our earnings management measure. Previous research has shown that private firms engage more in earnings management in countries with weak legal enforcement (Burgstahler et al., 2006). To control for the influence of legal enforcement on earnings management, we include a variable LEGAL. This variable is computed as the mean of three legal variables from La Porta et al. (1998), which measure the quality of the legal system or enforcement: efficiency of the judicial system, rule of law and a corruption index.\(^{17}\) LEGAL ranges from 0 to 10, and higher values correspond to stronger legal enforcement. Since private firms are expected to engage less in earning management in strong legal protection environments, we expect the coefficient on LEGAL to be negative.

To control for the potential influence of legal enforcement on audit quality, and hence mitigate potential alternative explanations regarding the cross-country
variation in audit quality differentiation in private firms, we additionally include an interaction term $B4 \times LEGAL$. However, we do not expect investor protection or legal enforcement to enhance audit quality differentiation between Big 4 and non-Big 4 auditors for private client firms. We therefore expect the coefficient on this interaction term to be insignificant. In addition, in our sensitivity analysis, we replace LEGAL by a number of other institutional variables which could potentially influence earnings management or audit quality.

To control for differences in earnings management incentives and firm characteristics that are systematically associated with accruals, we include the following variables. First, 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).

Second, we include a leverage variable ($LEV$), calculated as the ratio of total liabilities to total assets, which can have an impact on earnings management in two directions. While highly leveraged firms could be expected to engage more in upward earnings management to avoid debt covenant violations (Watts and Zimmerman, 1990; DeFond and Jiambalvo, 1994; Young, 1999), alternatively, high leverage may induce income-decreasing earnings management in financially distressed firms in view of contractual renegotiations (Becker et al., 1998).

Third, to control for differences in performance, we include the yearly percentage change in sales ($GROWTH$) and the yearly return on assets as measured by earnings divided by lagged total assets ($ROA$) (Dechow et al., 1995; Young, 1999). All control variables are computed as industry-level medians.  

Finally, we include industry dummies ($IND$) to control for industry effects on earnings management. The industry classification is based on Campbell (1996) and is illustrated in Table 1.

Hence, our empirical model looks as follows:

$$EM_{Agg} = \beta_0 + \beta_1 B4 + \beta_2 TAX + \beta_3 B4 \times TAX + \beta_4 LEGAL$$
$$+ \beta_5 B4 \times LEGAL + \beta_6 LNASSETS + \beta_7 LEV$$
$$+ \beta_8 GROWTH + \beta_9 ROA + \beta_{10} IND + \epsilon$$

where:

- **Dependent variable**
  - $EM_{Agg}$ = aggregate earnings management measure ($EM_{Agg}$)

- **Independent variables**
  - $B4$ = dummy variable (company has a Big 4 auditor = 1, else = 0)
  - $TAX$ = dummy variable (high tax alignment = 1, else = 0)
  - $LEGAL$ = legal enforcement computed as the mean of three legal variables which measure the quality of the legal system or
enforcement, for instance, efficiency of the judicial system, rule of law and corruption index (La Porta et al., 1998)

\[ \text{LNASSETS}_t = \text{natural logarithm of total assets in year } t \]
\[ \text{LEV}_t = \text{ratio of total liabilities to total assets in year } t \]
\[ \text{GROWTH}_t = \text{yearly percentage change in sales} \]
\[ \text{ROA}_t = \text{yearly return on assets as measured by earnings divided by lagged total assets} \]
\[ \text{IND} = \text{vector of industry dummies based on Campbell (1996), as illustrated in Table 1. It is noted that Campbell industry group No. 1 (Agriculture and Forestry) is the industry of reference.} \]

4. Results

4.1. Descriptive Statistics

Table 2 illustrates our sample composition, mean values of the four individual earnings management measures (EM1 to EM4) and the aggregate earnings management measure (EM\text{Agg}) for the different industry–country groups. As illustrated in Table 2, a large percentage of European private firms are audited by non-Big 4 audit firms. Contrary to prior research on audit quality using US data, our study does not suffer from poor variation in the audit variable. Table 2 further indicates that, overall, industry groups with a Big 4 auditor have a lower aggregate earnings management measure compared to non-Big 4 auditors. This result is also observed at country level, except for the Netherlands and the UK. For the individual earnings management scores, we observe a similar pattern except for EM1.

Table 3 presents the descriptive statistics for the institutional variables by country. The institutional variables that we consider in our main analysis are tax alignment (TAX) and legal enforcement (LEGAL), which is a control
variable. In our sensitivity analysis, we consider the litigation index from La Porta et al. (2006) and the accruals index from Hung (2001).

Table 4 presents descriptive statistics of the control variables used in the multivariate analysis. Table 4 indicates that, overall, companies with a Big 4 auditor are larger and are less growing. With respect to leverage and return on assets, no clear pattern arises.
Table 5 provides Pearson and Spearman correlation coefficients of the different earnings management measures, audit quality, legal enforcement and tax alignment. All earnings management scores seem to be significantly correlated with each other, except for EM2 (loss avoidance), which is only significantly correlated with EMAgg. Because reliably measuring loss avoidance requires a substantial amount of firm-years, it is possible that we failed to measure this proxy consistently. Hence, we use EMAgg as dependent variable for the multivariate analyses, which is expected to mitigate potential measurement error. Audit quality is significantly negatively correlated with EMAgg. While legal enforcement (LEGAL) is strongly negatively correlated with EMAgg, TAX is positively correlated with EMAgg. TAX and LEGAL are also significantly negatively correlated.

4.2. Univariate Results

The univariate results are presented in Table 6. Table 6 indicates that, for the sample as a whole, companies with a Big 4 auditor engage less in earnings management compared to companies with a non-Big 4 auditor. When considering the institutional variable of interest, it appears that this audit quality difference is significant for companies domiciled in countries with high tax alignment. In low tax alignment countries (i.e. the UK and the Netherlands) having a Big 4 auditor even seems to be associated with more earnings management. Tax alignment increases earnings management for the sample as a whole and for companies with a non-Big 4 auditor.

4.3. Multivariate Results

The multivariate results are presented in Table 7. In column 1, we study audit quality differentiation in the sample as a whole, without differentiating on
institutional features. The results in column 1 show that overall, private firms engage significantly less in earnings management when audited by a Big 4 auditor compared to a non-Big 4 auditor.

In column 2, we include tax alignment (TAX) and the interaction between having a Big 4 auditor and tax alignment. Including these variables increases the explanatory power of the model. The results show that the coefficient of the Big 4 dummy is no longer significant, indicating that in low tax alignment countries, private clients of Big 4 auditors are not significantly associated with less earnings management than private clients of non-Big 4 auditors. To assess the difference in the magnitude of earnings management between clients of a Big 4 and a non-Big 4 audit firm in a high tax alignment country, we compare the coefficient of the tax variable (capturing the non-Big 4 audit firm effect) with the sum of the coefficients of the Big 4 variable and the interaction term.
between the B4 and TAX dummies (capturing the Big 4 audit firm effect). The coefficient for the interaction variable is significantly negative, indicating that in high tax alignment countries, a Big 4 audit firm constrains earnings management more compared to a non-Big 4 audit firm. These results show that the negative association between the magnitude of earnings management and having a Big 4 auditor only exists in countries with high tax alignment. Hence, our results suggest that tax authorities help in enforcing audit quality in private firms in high tax alignment countries. Further, the coefficient on tax alignment is significantly positive, indicating that private firms with a non-Big 4 auditor engage more in earnings management when they are domiciled in countries with a high tax alignment. As explained above, this result is consistent with expectations because of increased incentives to manage earnings in order to lower taxation.

In column 3, we additionally include the institutional variable on legal enforcement (LEGAL) as well as the interaction variable between Big 4 auditor and degree of legal enforcement. Introducing these variables further increases the
explanatory power of the model. The results presented in column 3 show a significant negative coefficient for legal enforcement implying that legal enforcement provides a constraint on earnings management in private firms. This finding is consistent with the results of Burgstahler et al. (2006). The interaction variable between Big 4 auditor and legal enforcement is, however, not significant. This implies that legal enforcement does not significantly increase audit quality differentiation. This result is consistent with our expectation that litigation risk for auditors in the private client segment market is not necessarily higher in countries with stronger investor protection or legal enforcement. The regression results further show that leverage and return on assets are significant control variables in all three models.

**4.4. Sensitivity Analyses**

As a first sensitivity analysis, we replace LEGAL by other institutional variables which could potentially influence earnings management or audit quality differentiation. In this way, we further mitigate potential alternative explanations regarding the cross-country variation in audit quality differentiation in private firms. In this respect, we include the litigation index from La Porta et al. (2006), LITIGATION, which measures the effectiveness with which investors can

<table>
<thead>
<tr>
<th>Table 6. Univariate analysis</th>
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<tr>
<td><strong>EM\textsubscript{Agg}</strong></td>
</tr>
<tr>
<td><strong>Median (N)</strong></td>
</tr>
<tr>
<td>Total sample</td>
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<tr>
<td></td>
</tr>
<tr>
<td>High tax alignment</td>
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<td></td>
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<tr>
<td>Low tax alignment</td>
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<tr>
<td>t-Statistic</td>
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<tr>
<td>Z-Statistic Wilcoxon Mann–Whitney</td>
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</tbody>
</table>

The table reports mean and median values of the aggregate earnings management index, EM\textsubscript{Agg}. EM\textsubscript{Agg} is constructed such that higher values correspond to higher levels of earnings management. Further, test statistics on differences in mean and median values of EM\textsubscript{Agg} are reported. *, **, *** indicate statistical significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed). Companies either have a Big 4 auditor or a non-Big 4 auditor. Belgium, Finland, France and Spain are classified as high
recover damages from companies, directors and auditors when misleading information is disclosed, and the accruals index from Hung (2001), ACCRUAL, to control for differences in accounting regulation. These variables (results not reported) are not significant. Also their interactions with auditor quality are not

\[
\text{EMAgg} = \beta_0 + \beta_1 B4 + \beta_2 TAX + \beta_3 B4*TAX + \beta_4 LEGAL + \beta_5 B4*LEGAL + \beta_6 \text{LNASSETS}_t + \beta_7 \text{LEV}_t + \beta_8 \text{GROWTH}_t + \beta_9 \text{ROA}_t + \beta_{10} \text{IND} + \epsilon
\]

<table>
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<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>37.020</td>
<td>-3.713</td>
<td>82.867</td>
</tr>
<tr>
<td></td>
<td>(0.746)</td>
<td>(-0.064)</td>
<td>(1.270)</td>
</tr>
<tr>
<td>B4</td>
<td>-7.680</td>
<td>6.694</td>
<td>14.222</td>
</tr>
<tr>
<td></td>
<td>(-2.364)**</td>
<td>(1.403)</td>
<td>(0.501)</td>
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<td>TAX</td>
<td>17.347</td>
<td>11.822</td>
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<tr>
<td></td>
<td>(3.743)**</td>
<td>(2.262)**</td>
<td></td>
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<tr>
<td>B4 * TAX</td>
<td>-20.861</td>
<td>(-3.780)**</td>
<td>(-3.561)**</td>
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<td>LEGAL</td>
<td>-5.286</td>
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<td></td>
<td>(-2.249)**</td>
<td></td>
<td></td>
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<tr>
<td>B4 * LEGAL</td>
<td>-0.474</td>
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<td></td>
<td>(-0.166)</td>
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<td>LN\text{NASSETS}_t</td>
<td>-0.177</td>
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<td></td>
<td>(-0.041)</td>
<td>(0.467)</td>
<td>(-0.365)</td>
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<tr>
<td>GROWTH_t</td>
<td>-50.573</td>
<td>-9.043</td>
<td>-10.029</td>
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<td></td>
<td>(-0.891)</td>
<td>(-0.157)</td>
<td>(-0.175)</td>
</tr>
<tr>
<td>\text{LEV}_t</td>
<td>44.098</td>
<td>43.086</td>
<td>41.237</td>
</tr>
<tr>
<td></td>
<td>(1.849)*</td>
<td>(2.026)**</td>
<td>(1.863)*</td>
</tr>
<tr>
<td>\text{ROA}_t</td>
<td>-406.245</td>
<td>-309.607</td>
<td>-381.437</td>
</tr>
<tr>
<td></td>
<td>(-3.751)**</td>
<td>(-3.230)**</td>
<td>(-3.676)**</td>
</tr>
<tr>
<td>IND</td>
<td>Included</td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td>\text{N}</td>
<td>113</td>
<td>113</td>
<td>113</td>
</tr>
<tr>
<td>\text{R}^2 (Adjusted)</td>
<td>0.360</td>
<td>0.413</td>
<td>0.510</td>
</tr>
<tr>
<td>\text{F}</td>
<td>4.932***</td>
<td>5.376***</td>
<td>6.830***</td>
</tr>
</tbody>
</table>

The table reports OLS coefficients and t-statistics are based on heteroscedastic-consistent standard errors. * * * indicate statistical significance at the 0.10, 0.05 and 0.01 level, respectively (two-tailed). EMAgg is an aggregate earnings management measure, constructed such that higher values correspond to higher levels of earnings management. B4 takes on a value of one when a firm has a Big 4 auditor and zero otherwise. LEGAL is a measure of legal enforcement, computed as the mean of three legal variables which measure the quality of the legal system or enforcement: efficiency of the judicial system, rule of law and corruption index (La Porta et al., 1998). TAX takes on a value of one when financial reporting and tax rules are highly aligned (Belgium, Finland, France and Spain) and zero otherwise (the Netherlands and the UK). Control variables are subgroup medians. We truncate firm-level realizations at the 0.5 and 99.5 percentile before computing subgroup medians. \text{LN\text{NASSETS}}\_t is the natural logarithm of total assets in year \text{t}. GROWTH\_t is the yearly percentage change in sales. \text{LEV}\_t is the ratio of total liabilities to total assets in year \text{t}. \text{ROA}\_t is the yearly return on assets as measured by earnings divided by lagged total assets. \text{IND}, a vector of industry dummies with Campbell industry group No. 1 as industry of reference, are included but not reported.
significant and including these variables does not alter our results. Hence, neither the litigation variable nor the accounting regulation variable has incremental explanatory power with regard to audit quality differentiation in private firms across European countries.

As a second sensitivity analysis, we further subdivide the non-Big 4 audit firms into the so-called second-tier audit firms and small audit firms. Since Big 4 audit firm concentration of the European private client audit market is much lower compared to the public client market, the traditional distinction between Big 4 and non-Big 4 audit firms might not be adequate in these less concentrated markets. We expect a large auditor to provide a higher audit quality compared to a small auditor. In particular, Big 4 auditors are expected to provide a higher audit quality compared to non-Big 4 (both second-tier and small) auditors, while second-tier auditors are considered to provide a higher audit quality compared to small auditors. To examine this, we include in our regression analysis, a vector of audit dummies (AUD) indicating whether the company has a Big 4 auditor (B4) or not and whether the company has a second-tier auditor (ST) or not. The auditor of reference is the small auditor. Second-tier audit firms are identified as member firms of the Top 20 International Accounting Firms and Networks, excluding Big 4 audit firms (Broom, 2002). Subdividing the non-Big 4 audit firms into the so-called second-tier audit firms and small audit firms does not show significant differences in audit quality between these two types of audit firms (results not reported).

In addition, the following sensitivity checks (results not reported) were performed to verify the robustness of our results. First, 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 behaviour, might also influence auditor choice. 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). Hence, in a first stage, auditor choice is explained by all the exogenous variables of the earnings management model. Including the first stage residual does not influence results nor is the coefficient on the first stage residuals significant, which would indicate that the model does not suffer from an endogeneity bias.

Furthermore, to address the concern that, in some instances, there is no head-to-head comparison possible between companies with a Big 4 auditor and companies with a non-Big 4 auditor, we construct a balanced sample, in which each industry–country subgroup with a Big 4 auditor has a non-Big 4 counterpart and vice versa. This reduced sample results in 98 industry–country observations and provides similar results as our initial sample.
Finally, as companies with a Big 4 auditor are on average larger than companies with a non-Big 4 auditor, we also perform our regressions using only the largest quartile of companies with a non-Big 4 auditor. Hereby, we improve the size comparability between the two groups. As we require a minimum of 10 observations per industry–country–auditor subgroup, this results in 109 industry–country observations. Results are qualitatively similar.

5. Conclusion

Previous studies have documented that Big 4 audit firms, compared to non-Big 4 audit firms, do a better job in constraining earnings management in public firms domiciled in strong investor protection countries. This study examines (1) whether Big 4 audit firms provide a constraint on earnings management in private firms and (2) to what extent this audit quality differentiation is uniform across countries.

Using data on private firms in European countries, this study provides evidence that privately held companies engage less in earnings management when they have a Big 4 auditor compared to a non-Big 4 auditor. However, consistent with our hypothesis, we find that this association only exists in countries with a high tax alignment. We attribute this result to the increased enforcement of tax authorities with respect to financial statements in these countries. In high tax alignment countries, tax authorities rely on financial statements to determine taxable income and are as such considered a direct stakeholder and user of the financial statements. Hence, financial statements are likely to be more scrutinized, which increases the probability of audit failure detection, which will negatively affect auditor reputation.

In addition, we find consistent with Burgstahler et al. (2006), that private companies domiciled in countries with a stronger legal environment engage less in earnings management. As expected, we do not find audit quality differentiation to be larger in countries with stronger legal systems. This is consistent with the argument that the probability of audit failure detection and the risk of litigation or disciplinary sanctions is much lower in private firms because financial statements of private firms are not scrutinized as much, even in countries generally considered as having a strong legal enforcement.

Other institutional variables such as litigation or accrual accounting do not provide incremental explanatory power above tax alignment in explaining cross-country variation in audit quality differentiation. Although the private client audit market in Europe is less concentrated compared to the public client audit market, subdividing non-Big 4 audit firms into second-tier and small audit firms does not provide support for an audit quality difference between second-tier audit firms and small audit firms with regard to earnings management. Further, our results are robust to a number of other sensitivity tests.

These findings contribute to the literature on audit quality differentiation between Big 4 and non-Big 4 auditors. While various Anglo-American studies
on public firms use DeAngelo’s auditor reputation theory (1981) to explain the observed audit quality differentiation (e.g. Francis et al., 1999; Gore et al., 2001), other studies have shown that audit quality differentiation is weak or absent for public companies in countries with weak investor protection, as the probability of reputational damage due to a low quality audit is much lower in these countries (e.g. Maijoor and Vanstraelen, 2006; Francis and Wang, 2008). These studies indicate that DeAngelo’s reputation rational (1981) is conditional upon a high probability of audit failure detection and litigation, damaging the auditor’s reputation. Our results contribute to this viewpoint by showing that a negative association between earnings management in private firms and having a Big 4 auditor only exists in high tax alignment countries. In addition, this study contributes to the recent literature on demand and supply of financial reporting quality in private firms, constituting the majority of the EU economy and the EU audit services market.

Our results are subject to the following limitations. First, while we use an aggregate earnings management measure that is expected to mitigate potential measurement error (Leuz et al., 2003), we acknowledge that earnings management remains difficult to measure. Second, although we have controlled for various earnings management incentives, there may be other incentives that we have not controlled for. Third, as every cross-country study, our research is subject to the influence of different institutional factors which are difficult to disentangle, making it difficult to control for the potential impact of other institutional differences than those investigated in the study. Finally, our study is focused on earnings management which is only one indirect measure of audit quality. Future research is encouraged to consider other measures of audit quality and to further examine factors influencing audit quality in private client firms and to assess to what extent agency theory provides an explanation for auditor choice and audit quality in the private client segment market. In this respect, it seems warranted to make a distinction between private companies with separation of ownership and management, and private companies that are run by owners.

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Notes

1For convenience we use the term Big 4 auditor to identify the large international audit firm networks (Big 6/5/4). Some of the studies we refer to were conducted before the mergers resulted in a reduction to four international audit networks. Up to 2002, Big 5 audit firms included PricewaterhouseCoopers, Deloitte Touche Tohmatsu, Ernst & Young, KPMG and Arthur Andersen. In 2002, Arthur Andersen disappeared after the high profile financial scandal in its client firm Enron.

2It can be argued that in low tax alignment countries with a higher litigation risk (such as the UK), Big 4 auditors will also have an incentive to constrain earnings management to avoid private litigation (for example, bank lawsuits). To control for this, we perform a sensitivity analysis (see Section 4) with a litigation index as control variable. From this analysis, it appears that litigation does not provide incremental explanatory power above tax alignment in explaining cross-country variation in audit quality differentiation.

3Amadeus is a database containing financial data of public and private firms in Europe. Due to data limitations (see Section 3.1), we could only include 6 out of the 15 EU member states in 2002.

4In 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 EUR.

5While the exercised discretion in reporting earnings can also be used to signal private information and reduce information asymmetry (e.g. Subramanyam, 1996), we assume earnings are managed for opportunistic reasons to mislead some stakeholders or influence contractual outcomes, following the definition of Healy and Wahlen (1999).

6See note 4.

7Similar to DeFond and Hung (2004) we define investor protection as ‘the extent of laws that protect investors’ rights and the strength of the legal institutions that facilitate law enforcement’.

8Tax enforcement is considered to be stronger in high tax alignment countries with respect to financial statements and with respect to the auditors, which are considered to provide assurance over the accuracy of these financial statements. We hereby do not claim that tax authorities are better at enforcing tax law in these countries compared to low tax alignment countries.

9However, increased enforcement due to the increased scrutiny of financial statements by tax authorities does not appear to lead to less earnings management in countries with a strong tax alignment, as indicated by the results of Burgstahler et al. (2006). They argue that stronger tax alignment is associated with more earnings management, since companies have more direct incentives to influence financial reporting income to minimize their tax expense when this income figure is taken as the basis for taxation.

10For example, KPMG tax shelter fraud in 2005.

11Listing 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.

12Financial 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. Similar to Fenn (2000) we exclude subsidiaries of quoted companies as their management and financial reporting decisions are likely to be influenced by public parent companies.

13This makes the calculation of EM2, described in Section 3.2, impossible.
Following Dechow et al. (1995), we compute total 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 change over the fiscal year.

While a negative correlation between accruals and operating cash flow is inherent to accrual accounting, differences in the magnitudes of this correlation indicate, ceteris paribus, variation in the extent of earnings smoothing. Moreover, because accounting systems likely underreact to economic shocks, using accruals to signal firm performance results on average in a less negative (and in specific cases even positive) correlation with cash flows (Leuz et al., 2003).

While Spain theoretically experienced a great reduction in tax alignment in the early 1990s, in practice a strong tax link still exists in Spanish individual financial statements (Oliveiras and Puig, 2005).

This variable is the same as the institutional variable used by Burgstahler et al. (2006).

We truncate firm-level realizations at the 0.5 and 99.5 percentile before computing subgroup medians.

We have also performed our analyses with EM2 excluded from the aggregate earnings measure. Our conclusions with respect to audit quality differentiation and tax alignment remain qualitatively similar.

Comparison of this list with the 1999 list revealed only one difference. In 2002 one firm had been replaced by number 23 of 1999.

References


