Earnings management within Europe: the effects of member state audit environment, audit firm quality and international capital markets

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Abstract—This paper studies earnings management in a European context. More specifically, the effects of three factors on earnings management within Europe are studied: member state audit environment, audit firm quality and presence in international capital markets. The national audit environments within Europe vary strongly in terms of independence rules and auditor liability. Hence, it can be expected that the restrictions imposed by national audit environments on earnings management vary. However, there are two factors that can mitigate the national audit environment effect: Big Four audit firm quality and a company's reliance on international capital markets. Using data for the period 1992–2000 from listed firms in three EU countries with clearly distinct audit environments (France, Germany and the UK), we have the following main findings. First, a stricter audit environment reduces the magnitude of earnings management, irrespective of the type of auditor (Big Four audit firm or non-Big Four audit firm). Second, there is no evidence of an international Big Four audit quality effect in Europe. Third, a company's reliance on international capital markets does not limit its earnings management. The evidence provided in this study is relevant for the current debate in the European Union on the harmonisation of auditing. For the comparability of earnings, not only is the standardisation of financial reporting important but also the standardisation of enforcement mechanisms, as embodied in the national audit environment and the quality of audit firms. The results of this study suggest that the enforcement of financial reporting still varies strongly across member states of the EU.

1. Introduction

This study examines the effects on earnings management of differences in EU member states' audit environments, audit firm quality and reliance on international capital markets. Our paper contributes to the literature in three ways. First, Gore et al. (2001) pointed out that there is an 'increasing interest in the impact of different economic environments and GAAP regimes on the attributes of accounting earnings (Pope and Walker, 1999; Ali and Hwang, 2000; Ball et al., 2000), and on the incidence of earnings and forecast management (Brown and Higgins, 2001; Leuz et al., 2003)'. Our paper contributes to this increasing interest by analysing the incidence of earnings management in three European countries: France, Germany, and the UK. These three countries clearly vary in terms of their audit environment (independence rules and auditor liability). These three countries are also the originating countries of three distinct legal traditions: French code law, German code law and English common law (LaPorta et al., 1998).[1] We study the effect of differences in national audit environments on the magnitude of earnings management. Second, given that there is strong evidence in the US of Big Four audit firm conservatism (e.g. Becker et al., 1998), we consider whether Big Four[2] auditors constitute a constraint on earnings management in the three European countries under study and if so, whether this quality effect overrides differences as a result of national audit environments. In other words, to what extent do the international Big Four audit firms provide a standardised high quality audit across different jurisdictions within Europe? Finally, we consider whether a listing on the New York Stock Exchange

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The final version of this paper was accepted in October 2005.

[1] For a detailed description of the legal and accounting environment of these three countries, we refer to Giner and Rees (2001).

[2] For convenience, this paper uses the term 'Big Four auditor' to identify the large international audit firm networks. Some of the studies referred to were conducted before the mergers resulted in a reduction to four international audit firm networks.

(NYSE) influences the incidence of earnings management. The effect of a listing on an international capital market can be twofold. A foreign exchange listing might result in additional regulatory requirements reducing national opportunities for earnings management. However, international capital market pressures might also give additional incentives for increasing the level of earnings management. The net effect of these opposing forces is, a priori, unclear.

The results of this study are relevant for the current discussion on the comparability of financial statements within the EU, and specifically the comparability of earnings. It is assumed that the implementation of the 4th and 7th Directive has increased the comparability of financial statements within the EU. Further, expectations are that the requirement for listed companies in the EU to apply International Financial Reporting Standards (IFRS) for the consolidated financial statements as of the year 2005 will further increase comparability of earnings. However, the comparability of earnings reported not only depends on the set of accepted accounting standards, but also on the national quality of audits and the constraints imposed on earnings management by the national audit environment. So far, the standardisation of national auditing laws and regulations within the European Union has been rather limited (Buijink et al., 1996).

Related to this issue is whether the Big Four audit firms provide the same audit quality across countries. While the minimum levels of national audit quality might vary from country to country, it could be argued that the Big Four audit firms have strong incentives to provide the same high audit quality level in different countries. The reason is that their clients attract capital from international markets, and even national audit failures will affect their international reputation.

The main findings of this study are the following. First, the magnitude of earnings management across countries in the EU appears to be a function of differences in national audit environments. In particular, the results suggest that companies in a country with a strict audit quality regime engage less in earnings management compared to companies in a country with a more flexible audit regime. Second, the presence of a Big Four auditor cannot override the observed differences in level of earnings management as a result of the national audit environment. In addition, the Big Four audit quality effect is not found to be uniform across European countries. Finally, the results regarding the reliance on international capital markets suggest that a cross-listing on the NYSE does not constrain earnings management but rather is associated with a higher level of abnormal working capital accruals. Overall, these results imply

that stricter auditor independence regulation can increase earnings quality, that there is no global Big Four audit quality effect in Europe, and that the bonding role of SEC regulation does not limit earnings management of European companies.

The remainder of this paper is organised as follows. In Section 2, we review relevant previous literature. In Section 3, we develop our research hypotheses. The differences in audit environment between France, Germany and the UK are described in Section 4. Sections 5 and 6 describe the sample selection procedure and the research design. In Sections 7 and 8, we present the empirical results of the main analysis and sensitivity analyses. Finally, we draw conclusions, address limitations of the study and give suggestions for future research.

2. Previous literature
2.1. International differences in earnings management
Ball et al. (2000) suggest that the demand for accounting earnings is systematically different in code-law countries compared to common-law countries. Common-law countries are characterised by: transactions at 'arms-length'; a diverse base of investors; and a relatively high risk of litigation. In code-law countries, capital markets are less active. Companies are more financed by banks, other financial institutions and the government, which results in less need for public disclosure. Moreover, litigation rates are relatively low. Daske et al. (2003) provide evidence that discontinuities in the distribution of earnings are more pronounced in code-law countries, and especially in German accounting origin countries, compared to the US and the UK. Hence, earnings management and loss avoidance practices appear to be more prevalent in companies from code-law countries compared to companies from common-law countries.

Leuz et al. (2003) provide evidence suggesting that companies in countries with developed equity markets, dispersed ownership structures, strong investor rights and legal enforcement engage in less earnings management.

Coppens and Peek (2005) examine earnings management by private companies in Europe. They find that private European companies in countries with low financial and tax alignment avoid small losses, and that private European companies in countries with high financial and tax accounting alignment manage earnings to reduce taxes.

In this paper, we focus on the variation in the level of earnings management of companies within Europe. We select one common-law country (UK) and two code-law countries (France and Germany). These three countries are clearly dis-

tinct from each other in terms of audit environment. Following the results of Leuz et al. (2003), France and Germany are in the same institutional cluster, defined as 'insider economies with less-developed stock markets, concentrated ownership, weak investor rights, but strong legal enforcement'. However, France and Germany are very different in terms of flexibility of audit quality regime. We examine to what extent the differences in audit environment in each of the three countries have an effect on the extent of earnings management.

2.2. Audit constraint on earnings management

Evidence has been provided in the US and the UK that Big Four audit firms constitute a constraint on earnings management. Using US data, DeFond and Jiambalvo (1991) show that non-fraudulent clients of Big Four auditors are less likely to have errors or irregularities, which are considered to be proxies for earnings management. In a subsequent study, DeFond and Jiambalvo (1993) provide evidence that auditor-client disagreements, resulting from incentives to manage earnings, are more likely to occur in the case of a Big Four auditor.

Similarly, Becker et al. (1998) provide evidence that clients of non-Big Four auditors report discretionary accruals that increase income relatively more than the discretionary accruals reported by clients of Big Four auditors. Moreover, it was found that the mean and median of the absolute value of discretionary accruals are greater for firms with non-Big Four auditors. Francis et al. (1999) report for a sample of NASDAQ firms that, even though Big Four auditors have higher levels of total accruals, they also have lower amounts of estimated discretionary accruals. Chung et al. (2003) find evidence in the US that Big Four auditors influence their clients to adopt more conservative accounting procedures. For UK firms, Gore et al. (2001) show that Big Four auditors are more able to constrain earnings management than non-Big Four auditors when a high level of non-audit services is provided. ·

Despite these consistent findings of a Big Four audit firm quality effect, it should be noted that nearly all studies are conducted within Anglo-Saxon countries. In the context of this study, it can be questioned whether the Big Four audit firm quality effect holds in all audit environments. For example, Francis and Wang (2004) document that Big Four auditor conservatism is greater in countries with strong investor protection environments and a common law legal tradition.

We examine whether Big Four audit firms reduce the level of earnings management in the three European countries (two code law and one common law) included in our study, to what extent this quality effect overrides differences in national audit environments, and more importantly whether the effect is similar in all three countries.

2.3. Measures of earnings management

Different models have been suggested in the literature to measure earnings management. Healy and Whalen (1999), Young (1999) and McNichols (2000) provide a good overview of the earnings management literature and the different models used to measure earnings management. Three different approaches are commonly used to detect earnings management: (i) aggregate accruals models; (ii) specific accruals models; and (iii) frequency of distribution approaches (McNichols, 2000). Unfortunately, none of the existing approaches perfectly captures discretionary accruals. Being aware that there is no best method to estimate discretionary accruals, we have chosen to examine working capital accruals to detect earnings management for the following reasons (see Peasnell et al., 2000; DeFond and Park, 2001).

First, DeFond and Jiambalvo (1994) and Teoh et al. (1998) argue that working capital accruals are more susceptible to manipulation than non-working capital accruals. Beneish (1998) and Young (1999) argue that focusing exclusively on the working capital component of total accruals is "potentially more appealing since continuous (i.e., year-on-year) earnings management via the depreciation accrual is likely to have limited potential due to its visibility and predictability" (Peasnell et al., 2000).

Second, the commonly used regression-based accrual estimation methods (e.g. the Jones model) require large time-series of observations or a large number of industry-specific observations (e.g. DeFond and Jiambalvo, 1994). Using working capital accruals, we avoid the regression estimation problems to detect earnings management that occur outside the US due to smaller sample sizes. Indeed, one could argue that small-sample problems may increase the inaccuracy in estimating discretionary accruals.

3. Development of hypotheses

The main argument in this paper concerns the effects of differences in national audit environments on earnings management by companies. The national audit environments within Europe vary strongly in terms of independence rules and auditor liability. Hence, it can be expected that the restrictions imposed by national audit environments on earnings management vary. We hypothesise that:

Hypothesis 1: Companies in EU member states with strict audit quality regimes report ceteris paribus relatively lower absolute values of ab-

normal working capital accruals compared to companies in EU member states with flexible audit quality regimes.

It can be argued that the expected national audit environment effect on earnings management is influenced by the type of audit firm. This expectation is based on the argument that Big Four audit firms attempt to control the quality of their audits across jurisdictions. As the production of their audits is based on internationally recognised brand names, they have an incentive to provide a uniform level of audit quality in different countries. Consequently, it is hypothesised that:

Hypothesis 2: The magnitude of the absolute value of abnormal working capital accruals is ceteris paribus less affected by the type of national audit quality regime, in case of a Big Four audit firm compared to a non-Big Four audit firm.

While the laws and regulations in EU member states might set a minimum level of audit quality, companies and their auditors might voluntarily opt for a higher audit quality level for capital market reasons. Companies relying on international capital markets do not only take the restrictions imposed by their national market into account, but also the restrictions of the host country where they have an additional listing. For example, a German company listed on the NYSE, is also affected by the restrictions imposed by the SEC. It can be expected that this will affect the level of earnings management by the German company. Indeed, foreign companies listed on the NYSE fall under the jurisdiction of the SEC, which is known to be a demanding regulator (Lang et al., 2003). Cross-listed firms on the NYSE face more requirements in terms of additional disclosure, reconciliation of net income and shareholders' equity to US GAAP, and are subject to a higher litigation risk. However, it should be acknowledged that prior to the Sarbanes-Oxley Act (2002) the requirements for foreign firms cross-listed on the NYSE were less strict than for domestic firms. For example, during the period of our study (1992–2000), the NYSE permitted listed non-US companies to follow home country practices with regard to corporate governance and audit requirements. When the Sarbanex-Oxley Act comes into force for non-US companies with a listing on the NYSE (which will be for fiscal years ending after June 15, 2006), the flexibility of these non-US companies to follow home country practices with respect to corporate governance and audit requirements will be strong-

ly reduced. Despite the fact that during the period of study the SEC was less strict for foreign registrants, it can be expected that the US environment was still more demanding than the EU environment.

Reliance on international capital markets might also have an opposing effect on earnings management. International capital markets might increase the incentives for earnings management, for example as a result of capital market pressures to meet management forecasts. Hence, the direction of the effect of reliance on international capital markets on earnings management is unclear. Lang et al. (2003) provide evidence that non-US firms cross-listed in the US appear to be less aggressive in terms of earnings management and report in a more conservative and timely manner compared with a matched sample of foreign firms not cross-listed in the US but satisfying the listing criteria for the exchange on which the cross-listed firm is traded. However, Joos (2003) argues, 'although the viewpoint of the bonding role of SEC regulation is well-established in the literature, recent empirical work questions the effectiveness of the SEC regulation and its enforcement'. A more recent study by Lang et al. (2004) provides evidence that the earnings characteristics of non-US firms listed in the US differ systematically from domestic US-listed firms. A potential explanation for this result is that the SEC's enforcement policy is less effective against foreign firms. Given that the direction of the effect of a cross-listing on the NYSE is a priori unclear, we hypothesise that:

Hypothesis 3: The absolute value of abnormal working capital accruals of companies cross-listed on the NYSE will ceteris paribus differ from the absolute value of abnormal working capital accruals of companies not relying on this international source of capital.

4. Member State Audit Environment

The Eighth Directive (84/253/EEC) aimed to achieve harmonisation of auditing regulation within the EU. However, the Directive was very general and EU member states were free to maintain and apply specific national auditing regulations. This has resulted in a large variation in auditing regulation across EU member states.[3] This variation is clearly shown in the study of Buijink et al. (1996) providing a detailed description of the auditing regulations in the member states of the EU. The countries included in our study (France, Germany and the UK) also clearly show variation in strictness of auditor independence regulation. We rank the regulatory systems in the countries included in this study as follows from a relatively strict audit quality regime to a more flexible audit quality regime: France, UK and Germany. This ranking

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[3] It is noted that the Eighth Directive of 1984 is currently being revised. The European Commission expects to publish the revised Eighth Directive in 2006. It is expected that the revised Directive will reduce the large variation in auditing regulations across EU member states.

is based on the presence or absence of auditor independence rules, which aim to promote audit quality in these countries and for which there is cross-country variation. In particular, we consider auditor independence rules for listed firms on: length of audit mandate, rotation of audit partners, number of statutory auditors, approval of appointment, disclosure of audit fees, provision of management advisory services, advertising, peer review, review by regulators, auditors moving to clients or vice versa, and audit committees. Furthermore, we compare the risk of litigation in the three countries under study. Table 1 provides an overview of the presence or absence of each of these independence rules during the period under study (1992–2000) based on Buijink et al. (1996), Ordelheide (2001) and publications available on the websites of the national auditing professions (http://www.icaew.co.uk; http://wwwcncc.fr; http://www.idw.de).

France is the country that has the highest number of regulations regarding audit quality. In particular, France imposes restrictions on the minimum length of the audit mandate, listed firms that need to consolidate are required to have a joint audit and the appointment of the statutory auditor needs to be approved by the stock exchange regulatory authority. The provision of management advisory services and advertising are not allowed and there are restrictions on auditors moving to clients or client personnel moving to audit firms. Statutory auditors are subject to reviews by peers and regulators. The UK is classified as the country with the second most strict audit quality regime. In particular, the UK has a requirement for rotation of audit partners, audit fees must be disclosed, auditors are subject to reviews by regulators, and there are restrictions on auditors moving to clients or client personnel moving to audit firms. Furthermore, the UK has a high risk of litigation compared to France and Germany. As shown in Table 1, Germany has a very limited number of auditor independence rules to safeguard audit quality. Moreover, the risk of litigation in Germany is low (see Blij et al., 1998). Hence, Germany has the most flexible audit quality regime of the three European countries included in our study. As stated in Hypothesis 1, we expect that companies domiciled in countries with a stricter audit quality regime (France and UK) will engage less in earnings management compared to companies in countries with a more flexible audit quality regime (Germany). Subsequently, we test whether the expected national audit environment effect is mitigated by audit firm quality and reliance on an international capital market, more specifically a cross-listing on the NYSE.

5. Sample selection

To collect data for this study, we used the August 2002 version of the Osiris database and the June 2000 and June 1998 versions of the Worldscope database. The Osiris and Worldscope databases contain historical financial data up to 10 years of listed firms around the world. We used the most recent version as well as two earlier available versions of the database to avoid potential survivorship bias.[4] Indeed, companies that went bankrupt are no longer included in a newer version of the database. Data are collected for France, Germany, and the UK for the period 1992–2000. All three countries have currently sizable and relatively well-developed capital markets. Consistent with previous research (e.g. Becker et al. 1998), financial institutions (SIC 6000–6999) and utility companies (SIC 4000–4999) were excluded. These industries have specific accounting requirements, have a high degree of complexity and have a different accrual generating process. To reduce the effect of outliers, we exclude companies in the top and bottom 1% of abnormal working capital accruals. These sampling criteria result in a total number of usable observations of 17,394 companies (France: 3,904; Germany: 4,067; UK: 9,423). All companies in our sample are firms listed on a stock exchange and 315 or 1.81% of the 17,394 firm-year observations include a cross-listing on the NYSE.

6. Research design

As argued above, we examine working capital accruals to detect earnings management because working capital accruals are more susceptible to manipulation than non-working capital accruals. Like DeFond and Park (2001), we define working capital accruals as the change in non-cash working capital (WC). Abnormal working capital accruals (AWCA) are defined as realised working capital minus normal working capital. Normal working capital is assumed to be a fixed proportion of sales (Dechow and Kothari, 1998; DeFond and Park, 2001). We approximate the expected working capital in the current year by the working capital of the previous year.[5] This gives the following expression:

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[4] It is acknowledged that a potential survivorship bias cannot be ruled out given that we had to use the June 1998 Worldscope database for our sample that stretches back to 1992. However, prior research (e.g. DeFond and Jiambalvo, 1994) has shown that financially stressed companies engage on average in more earnings management compared to non-stressed companies. Hence, including soon-to-be bankrupt companies will at a minimum not work against finding support for our hypotheses, and are likely to reinforce our results.

[5] Tests were also conducted with taking the average of the previous two years. This gives very similar results. However, the data loss was substantial. Therefore, we present the results using only working capital of the previous year.

Table 1
Overview of auditor independence rules for listed firms in France, UK and Germany, 1992–2000

	FRANCE	*UK*	*GERMANY*
	◄——————————————————————————————————————►		
	Strict		**Flexible**
Length of the first audit mandate	6 Years	1 Year[a]	Not regulated
Length of the renewed audit mandate	6 Years	1 Year[a]	Not regulated
Audit partner rotation requirement	No	Yes[b]	No
Joint audit requirement	Yes a joint audit is required for a restricted group of companies, including listed firms that need to consolidate	No	No
Requirement of approval of appointment of statutory auditor by any party other than the appointing party	Yes for listed firms, banks and other regulated industries	No except for banks and other regulated industries	No except for banks and other regulated industries
Disclosure of audit fees	No	Yes	No
MAS allowed for statutory auditors	No	Yes[c]	Yes[d]
Advertising allowed	No	Yes	No[e]
Peer review	Yes every 3 years for audit firms with listed firms	No	No
Review by regulators	Yes every year	Yes every 5 years for audit firms with listed firms	No
Restrictions on auditors moving to clients or client personnel moving to audit firms	Yes	Yes	No
Audit committee requirement	No	No[f]	No

Sources: Buijink et al. (1996), Ordelheide (2001) and publications available on the websites of the national auditing professions.

[a] Private companies are not required to re-elect statutory auditors each year. In that case, the statutory auditor remains appointed until action is taken to terminate the appointment.

[b] Requirement effective for listed firms from 1 September 1997.

[c] The provision of book-keeping and accounting services is forbidden in the case of listed or public-interest entities except if the services are of a routine clerical nature. Audit firms within the same legal entity cannot provide legal services.

[d] The provision of book-keeping and accounting services is forbidden.

[e] All forms of advertising are forbidden. However, an auditor may provide the name of his firm in academic articles, speeches, seminars, etc.

[f] The Bank of England requires banks to have an audit committee unless there are sound reasons for not having an audit committee. The Cadbury Committee recommended the establishment of audit committees but this was not mandatory.

$$AWCA_t = WC_t - [(WC_{(t-1)}/S_{(t-1)})* S_t]$$

where:

$AWCA_t$ = Abnormal working capital accruals in year t;

WC_t = Non-cash working capital in year t;

$WC_{(t-1)}$ = Non-cash working capital in the year preceding year t;

S_t = Sales in year t;

$S_{(t-1)}$ = Sales in the year preceding year t.

Subsequently, the abnormal working capital accruals of the year are scaled by the sales of that year. Our empirical analysis will focus on the absolute value of discretionary accruals.[6] Previous studies in this area tend to focus on positive discretionary accruals, the reason being that auditors have a higher risk of reputation loss in case of upward managed earnings compared to downward managed earnings. Hence, audit quality differences would especially be revealed in case of upward managed earnings. However, in the countries under study, there might be variations in the direction of the incentives to manage earnings. For example, in more tax-oriented reporting systems (e.g. Germany), audit quality might be revealed by limiting the opportunities for negative discretionary accruals. Therefore, we will focus on discretionary accruals per se. In this respect, Warfield et al. (1995) also indicated that the absolute value of discretionary accruals is a good proxy for the combined effect of income-increasing and income-decreasing earnings management decisions.

The three main company variables of interest in this study are: (1) in which EU member state the company operates; (2) whether the company is audited by a Big Four or a non-Big Four audit firm; and (3) whether the company is cross-listed on the NYSE. The effect of the national audit regime is measured with a dummy variable for each country under study. The effect of international capital markets is measured with a variable indicating whether the company is cross-listed on the NYSE.[7] Of all international capital markets, a NYSE listing can be expected to have the strongest effects both in terms of additional constraints and additional incentives. In terms of regulations regarding the quality of financial reporting, the NYSE and the SEC have the reputation of being the most restrictive. However, the NYSE is also known for having strong incentives to meet capital market expectations. Furthermore, we include a variable PYLIST for companies anticipating a listing on the NYSE as the reporting behaviour of these companies is also likely to be different.[8] We consider a period of one year prior to listing.

Consistent with previous studies on earnings management, the following variables are included in the model to control for earnings management incentives. First, we control for the size of a company proxied by the natural logarithm of total assets. It is argued in the literature that larger firms prefer downward earnings management due to political costs (see Young, 1999; Gore et al., 2001). Second, a leverage or gearing variable is included in the model. The direction of the effect of this variable is, a priori, unclear. Highly leveraged firms may have incentives for income-increasing earnings management in view of debt covenant violations (DeFond and Jiambalvo, 1994). However, financially distressed companies have also large negative accruals as a result of contractual renegotiations providing incentives to reduce earnings (Becker et al., 1998). Third, we include a performance measure as a control variable. Consistent with Dechow et al. (1995) and Young (1999), we include cash flow from operating activities to control for underlying (poor) performance, which may induce income-increasing earnings management. Cash flow from operating activities is computed indirectly given that direct information on operating cash flow is not widely available in the countries included in our study. Following Leuz et al. (2003), cash flow from operating activities is computed by subtracting the accrual component from earnings.[9] Leuz et al. (2003) compute the accrual component of earnings in a similar way to Dechow et al. (1995): change in non-cash working capital minus depreciation and amortisation. Finally, we include industry dummies to control for industry effects on earnings management. Formally, the model is as follows:

$$AWCA_t = \beta_0 + \beta_1 UK + \beta_2 FRA + \beta_3 Big4_t +$$
$$\beta_4 NYSE_t + \beta_5 PYLIST_t +$$
$$\beta_6 LNASSETS_t + \beta_7 GEAR_t +$$
$$\beta_8 OPCF_t + \beta_9 IND_{it} + \varepsilon_t$$

where:

$AWCA_t$ = Abnormal working capital accruals in year t;

UK = Dummy variable (UK company = 1, else 0);

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[6] Note that we use the terms discretionary accruals and abnormal working capital accruals interchangeably.

[7] We requested and received a list from the NYSE with the names of all non-US companies listed on the NYSE for each year during the period under study 1992–2000.

[8] We would like to thank the referee for suggesting to include this variable.

[9] A possible consequence is that this may induce a negative relationship between our earnings management measure, abnormal working capital accruals, and our OPCF measure. We do not believe though that this will affect the impact of our variables of interest on the magnitude of abnormal working capital accruals. If we run the multivariate analysis without the OPCF variable, this does not change the results.

Table 2
Descriptive statistics for absolute value abnormal working capital accruals

Panel A: Absolute value abnormal working capital accruals across countries

	N	Mean	Std. dev.	25%	50%	75%
France	3,904	0.052	0.074	0.011	0.029	0.060
Germany	4,067	0.062	0.084	0.013	0.033	0.075
UK	9,423	0.057	0.081	0.012	0.030	0.065
Pooled	17,394	0.058	0.080	0.012	0.031	0.066

Panel B: Test of means (Bonferroni test): Multiple comparisons of absolute value of abnormal working capital accruals

Country i	Country j	Mean difference (i–j)	Standard error	Significance
Germany	France	0.011	0.001	0.000
	UK	0.005	0.001	0.001
France	UK	–0.005	0.001	0.002

Panel C: Descriptive statistics

	Minimum	Maximum	Mean	Std. Deviation
LNASSETS	3.690	19.040	12.027	1.996
OPCF	–7.080	4.310	0.071	0.191
GEAR	–95.465	97.742	0.409	2.760
NYSE	0	1	0.018	0.13
PYLIST	0	1	0.002	0.045
Big4	0	1	0.640	0.480

Variable definitions:
LNASSETS = Natural logarithm of total assets;
OPCF = Cash flow from operating activities scaled by total assets;
GEAR = Ratio of long term debt to common equity;
NYSE = Dummy variable (Company is listed on the NYSE = 1, else 0);
PYLIST = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);
Big4 = Dummy variable (Company has Big Four auditor = 1, else 0).

FRA = Dummy variable (French company = 1, else 0);

$Big4_t$ = Dummy variable (Company has Big Four auditor = 1, else 0);

$NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0);

$PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);

$LNASSETS_t$ = Natural logarithm of total assets in year t;

$GEAR_t$ = Ratio of long term debt to common equity in year t;

$OPCF_t$ = Cash flow from operating activities in year t scaled by total assets;[10]

IND_{it} = Industry dummies (SIC 10–17: Mining & Construction; SIC 20–39: Manufacturing; SIC 50–59: Wholesale trade; SIC 70–89: Services).

It should be noted that Germany is the country of reference and SIC 01–09 (agriculture, forestry and fishing) is the industry of reference.

7. Empirical results

The empirical analysis relates to the period 1992–2000. As argued above, we use abnormal working capital accruals as a measure for earnings management. Table 2, Panel A, provides descriptive statistics on the magnitude of abnormal working capital accruals in France, Germany and the UK. The table clearly suggests that the magnitude of earnings management is the highest in Germany (0.062), followed by the UK (0.057) and France (0.052). This ranking corresponds with our expected ranking of countries based on the strictness of audit quality regime. The test of means, presented

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[10] As a sensitivity test, we have also scaled operating cash flows by lagged total assets. This does not change the results.

in Panel B of Table 2, shows that all differences in earnings management levels between these countries are significant. The descriptive statistics for the independent variables are reported in Panel C of Table 2.

The Pearson correlation matrix presented in Table 3 shows that while there are several statistically significant correlations between some of the explanatory variables, none are highly correlated. In addition, variance inflation factors (VIFs) are low which further indicates that there is no multicollinearity. The correlation matrix further indicates that there is a positive correlation (0.268) between a Big Four audit firm and a sample observation from the UK, while this correlation is negative for a sample observation from France (–0.207) and Germany (–0.111). This is consistent with prior research on audit market structure providing evidence that Big Four audit market concentration is much higher in Anglo-Saxon countries compared to continental European countries (Vander Bauwhede and Willekens, 2004). In addition, consistent with expectations, there is a positive correlation between company size and a Big Four auditor (0.270) and between company size and a listing on the NYSE (0.264).

Table 4 presents the univariate results for the pooled sample and the three countries separately. The results of the pooled sample show that the magnitude of income-decreasing abnormal accruals is not significantly different from the magnitude of income-increasing abnormal accruals. This finding suggests that the companies in our pooled sample manage their earnings both upwards and downwards. This is consistent with DeFond and Park (1997) showing that firms engage in income-increasing (decreasing) earnings management when earnings fall below (exceed) the sample median (by industry and year) and that have good (poor) future prospects based on analysts' forecasts. At a country level, we find that in France and the UK the magnitude of income-increasing abnormal accruals is not significantly different from the magnitude of income-decreasing abnormal accruals. However, in Germany we observe that the magnitude of income-increasing abnormal accruals is significantly higher than the magnitude of income-decreasing abnormal accruals. A priori, considering the importance of presenting positive earnings, it can be expected that listed companies have on average stronger incentives for income-increasing earnings management. As argued above, Germany is considered to have the least strict audit quality regime compared with France and the UK. Prior research (Hirst, 1994; Braun, 2001) suggests that auditors have a higher risk of reputation loss in cases where earnings are managed upwards compared with earnings managed downwards. However, if the audit quality regime is weak and the risk of litigation is low, auditors may not have sufficient incentives to be conservative.

The univariate results further show that for the pooled sample, Big Four auditors are associated with a significantly lower absolute value of abnormal working capital accruals compared with non-Big Four auditors, and also with a significantly lower magnitude of income-increasing and income-decreasing earnings management compared with non-Big Four auditors. Given that the UK has the largest number of observations in the pooled sample, this result may be driven by the UK. Indeed, we observe at a country level that this audit quality difference is most significant in the UK. In Germany, the audit quality difference is less significant and the differences between Big Four and non-Big Four auditors are smaller. In France the audit quality difference is not significant. The strong audit quality difference in the UK could be explained by the fact that the UK has a much stronger investor protection environment compared to France and Germany (LaPorta et al., 1998). Indeed, Francis and Wang (2004) provide evidence that Big Four auditor conservatism increases in more stringent investor protection environments. We explore the Big Four audit quality difference in the individual countries at a multivariate level in Section 8.

Table 4 also shows that the absolute value of abnormal working capital accruals is significantly lower for companies listed on the NYSE for the pooled sample. Distinguishing between income-decreasing earnings management and income-increasing management, it appears that only in the latter category does a NYSE listing have a significant effect. At the country level, we observe that companies listed on the NYSE are associated with a lower absolute value of abnormal working capital accruals, but this difference in magnitude is not significant in the individual countries. This is probably due to the very small number of observations with a NYSE listing when conducting the analysis at country level. It is acknowledged that in the pooled sample, the number of observations with a NYSE listing is also small (1.81%). Hence, caution is needed when drawing strong conclusions about the association between a NYSE listing and the level of earnings management.

Finally, it appears from Table 4 that focusing on the absolute value of abnormal working capital accruals gives overall stronger results than either income-increasing or income-decreasing abnormal working capital accruals. This could be due to the larger sample size when income-increasing and income-decreasing earnings management are combined, which increases the power of the tests. Moreover, focusing on the absolute value of accruals is appropriate as Warfield et al. (1995) show that the absolute value of accruals is a good proxy

Table 3
Pearson correlation matrix

	GERM	UK	FRA	Big4	NYSE	PYLIST	LNASSETS	GEAR	OPCF	SIC00	SIC10-17	SIC20-30	SIC50-59	SIC70-89	VIF
GERM	1														Reference
UK	-0.601 (0.000)	1													1.800
FRA	-0.297 (0.000)	-0.585 (0.000)	1												1.553
Big4	-0.111 (0.000)	0.268 (0.000)	-0.207 (0.000)	1											1.239
NYSE	-0.036 (0.000)	0.034 (0.000)	-0.004 (0.614)	0.094 (0.000)	1										1.093
PYLIST	0.002 (0.744)	-0.002 (0.744)	0.000 (0.953)	0.026 (0.001)	-0.006 (0.421)	1									1.007
LNASSETS	0.135 (0.000)	-0.210 (0.000)	0.114 (0.000)	0.270 (0.000)	0.264 (0.000)	0.074 (0.000)	1								1.369
GEAR	0.001 (0.879)	0.000 (0.964)	-0.002 (0.836)	0.004 (0.586)	0.000 (0.976)	0.000 (1.000)	0.000 (0.952)	1							1.000
OPCF	0.014 (0.072)	-0.025 (0.001)	0.016 (0.032)	0.028 (0.000)	0.024 (0.002)	0.010 (0.179)	0.107 (0.000)	0.000 (0.997)	1						1.015
SIC00	-0.082 (0.000)	0.120 (0.000)	-0.060 (0.000)	0.037 (0.000)	0.029 (0.000)	0.010 (0.201)	0.045 (0.000)	-0.004 (0.615)	0.010 (0.187)	1					Reference
SIC10-17	-0.024 (0.002)	0.040 (0.000)	-0.024 (0.001)	0.014 (0.072)	0.022 (0.003)	-0.010 (0.175)	0.063 (0.000)	-0.002 (0.785)	-0.041 (0.000)	-0.069 (0.000)	1				1.308
SIC20-39	0.163 (0.000)	-0.201 (0.000)	0.075 (0.000)	0.002 (0.839)	0.019 (0.010)	0.012 (0.118)	0.050 (0.000)	0.004 (0.565)	0.041 (0.000)	-0.299 (0.000)	-0.228 (0.000)	1			2.469
SIC50-59	-0.078 (0.000)	0.097 (0.000)	-0.036 (0.000)	0.036 (0.000)	-0.052 (0.000)	-0.013 (0.096)	0.002 (0.791)	-0.002 (0.776)	-0.001 (0.911)	-0.132 (0.000)	-0.100 (0.000)	-0.434 (0.000)	1		1.873
SIC70-89	-0.075 (0.000)	0.062 (0.000)	0.002 (0.824)	-0.084 (0.000)	-0.023 (0.002)	-0.013 (0.092)	-0.212 (0.000)	-0.002 (0.839)	-0.060 (0.000)	-0.132 (0.000)	-0.101 (0.000)	-0.437 (0.000)	-0.192 (0.000)	1	1.936

Variable definitions:

GERM = Dummy variable (German company = 1, else 0); UK = Dummy variable (UK company = 1, else 0); FRA = Dummy variable (French company = 1, else 0); Big4 = Dummy variable (Company has Big Four auditor = 1, else 0); NYSE = Dummy variable (Company is listed on the NYSE = 1, else 0); PYLIST = Dummy variable (Company is listed on the NYSE in year$_{t+1}$ = 1, else 0); LNASSETS = Natural logarithm of total assets; GEAR = Ratio of long term debt to common equity; OPCF = Cash flow from operating activities scaled by total assets; SIC 00 = Agriculture, Forestry & Fishing; SIC 10–17 = Mining & Construction; SIC 20–39 = Manufacturing; SIC 50–59 = Wholesale trade; SIC 70–89= Services.

Table 4
Univariate results for abnormal working capital accruals

	Pooled	France	UK	Germany
EARNINGS MANAGEMENT				
AWCA < 0: income-decreasing	−0.057 (n=8757)	−0.051 (n=2008)	−0.058 (n=4804)	−0.059 (n=1945)
AWCA ≥ 0: income-increasing	0.058 (n=8637)	0.052 (n=1896)	0.056 (n=4619)	0.066 (n=2122)
Difference (significance) (2-tailed)	t=−0.620 (0.536)	t=−0.399 (0.690)	t=1.549 (0.121)	t=−2.848 (0.004)
BIG 4 vs. NON BIG 4				
Absolute value AWCA				
Big 4	0.053 (n=11077)	0.050 (n=1763)	0.052 (n=7116)	0.060 (n=2198)
Non-Big 4	0.064 (n=6317)	0.053 (n=2141)	0.072 (n=2307)	0.066 (n=1869)
Difference (significance) (2-tailed)	t=−8.362 (0.000)	t=−1.397 (0.163)	t=−10.352 (0.000)	t=−2.283 (0.022)
AWCA < 0: income-decreasing				
Big 4	−0.053 (n=5708)	−0.049 (n=953)	−0.053 (n=3672)	−0.055 (n=1083)
Non-Big 4	−0.063 (n=3049)	−0.053 (n=1055)	−0.074 (n=1132)	−0.062 (n=862)
Difference (significance) (2-tailed)	t=5.628 (0.000)	t=1.293 (0.196)	t=7.227 (0.000)	t=1.920 (0.055)
AWCA ≥ 0: income-increasing				
Big 4	0.053 (n=5369)	0.051 (n=810)	0.051 (n=3444)	0.061 (n=1115)
Non-Big 4	0.064 (n=3268)	0.053 (n=1086)	0.070 (n=1175)	0.068 (n=1007)
Difference (significance) (2-tailed)	t=−6.168 (0.000)	t=−0.654 (0.513)	t=−7.481 (0.000)	t=−1.703 (0.089)
NYSE				
Absolute value AWCA				
NYSE listing	0.049 (n=315)	0.037 (n=67)	0.051 (n=210)	0.061 (n=38)
No NYSE listing	0.057 (n=17079)	0.052 (n=3837)	0.057 (n=9213)	0.062 (n=4029)
Difference (significance) (2-tailed)	t=−1.760 (0.078)	t=−1.628 (0.104)	t=−1.104 (0.270)	t=−0.097 (0.923)
AWCA < 0: income-decreasing				
NYSE listing	−0.052 (n=178)	−0.033 (n=38)	−0.056 (n=117)	−0.068 (n=23)
No NYSE listing	−0.057 (n=8579)	−0.052 (n=1970)	−0.058 (n=4687)	−0.058 (n=1922)
Difference (significance) (2-tailed)	t= 0.747 (0.455)	t=1.597 (0.110)	t=0.322 (0.748)	t=−0.534 (0.593)
AWCA ≥ 0: income-increasing				
NYSE listing	0.045 (n=137)	0.043 (n=29)	0.045 (n=93)	0.052 (n=15)
No NYSE listing	0.058 (n=8500)	0.052 (n=1867)	0.056 (n=4526)	0.066 (n=2107)
Difference (significance) (2-tailed)	t=−1.792 (0.073)	t=−0.654 (0.513)	t=−1.353 (0.176)	t=−0.615 (n=0.539)

Table 5
OLS regression results for pooled sample

Dependent variable:
Absolute value of abnormal working capital accruals (N = 16,758[a])

Variables	Parameter estimate	t-value	Significance
Constant	0.149	31.036	0.000***
UK	−0.012	−7.535	0.000***
FRA	−0.010	−5.879	0.000***
Big4	−0.001	−0.748	0.455
NYSE	0.018	3.999	0.000***
PYLIST	0.021	1.668	0.095*
LNASSETS	−0.006	−18.358	0.000***
GEAR	0.000	0.791	0.429
OPCF	−0.052	−16.579	0.000***
SIC10–17	0.026	8.494	0.000***
SIC20–39	−0.063	−3.441	0.001***
SIC50–59	−0.016	−7.550	0.000***
SIC70–89	0.012	5.669	0.000***
Adjusted-R^2	6.7%[b]		
F-value	100.703		0.000***

*p < 0.10, **p < 0.05, *** p < 0.01

Variable definitions:
UK = Dummy variable (UK company = 1, else 0);
FRA = Dummy variable (French company = 1, else 0);
$Big4_t$ = Dummy variable (Company has Big Four auditor = 1, else 0);
$NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0);
$PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);
$LNASSETS_t$ = Natural logarithm of total assets in year t;
$GEAR_t$ = Ratio of long term debt to common equity in year t;
$OPCF_t$ = Cash flow from operating activities in year t scaled by total assets;
SIC 10–17 = Mining & Construction;
SIC 20–39 = Manufacturing;
SIC 50–59 = Wholesale trade;
SIC 70–89 = Services.

[a] Due to lack of data, we could not measure cash flow from operating activities for all observations. This explains the difference in number of observations between the univariate results and the multivariate results.
[b] It is acknowledged that the adjusted R-Squared is low. However, the purpose of this study is not to develop a model to explain earnings management. We focus on the impact of the national audit environment, audit firm quality and international capital markets on the level of earnings management, while controlling for factors that are associated with earnings management based on prior research. A low adjusted R-Squared is not unusual in this type of studies (e.g. Becker et al., 1998). This remark also applies to the adjusted R-Squared of Tables 6–8.

to capture the combined effect of income-increasing and income-decreasing earnings management.

Table 5 presents the OLS regression results with Germany as the country of reference. The multivariate results confirm the significant differences in the magnitude of earnings management across countries. Companies in the UK and France engage significantly less in earnings management compared to Germany (p<0.01). This suggests that a stricter audit environment can reduce on average the extent to which companies engage in earnings management. Big Four audit firms do not appear to constitute a significant constraint on earnings management. While the univariate results did provide some evidence of a Big 4 audit quality effect, the results here do not. We further explore this by conducting a multivariate analysis at country level in Section 8. The multivariate results in Table 5 further suggest that, surprisingly, a NYSE listing does not constrain earnings management, but rather appears to be associated with a higher absolute value of abnormal working capital accruals (p<0.01). It is recalled that the univariate results indicated that a NYSE listing reduces earnings management. This apparent opposite result in the multivariate analysis could be explained by the fact that the multivariate analysis controls for the type of audit firm: nearly all

NYSE listed companies (97%) are audited by a Big Four audit firm. The multivariate results also suggest that the reporting behaviour of companies planning a listing on the NYSE differs from other companies in the sample. In particular, it appears that companies one year prior to a NYSE listing have a significantly higher level of abnormal working capital accruals (p<0.10). To reiterate, it is acknowledged that given the small number of observations in our sample with a NYSE listing, or anticipating such a listing, caution is needed when drawing strong conclusions about the association between a NYSE listing and the magnitude of accruals.

Finally, Table 5 shows for the control variables that larger companies engage significantly less in earnings management (p<0.01), and financially stressed companies (low or negative cash flow from operating activities) engage significantly more in earnings management (p<0.01), which is consistent with prior literature (e.g. DeFond and Jiambalvo, 1994). Furthermore, there are significant differences in the level of earnings management across industries in our samples: companies in the mining and construction industry and the services industry have a higher level of abnormal working capital accruals compared to companies in the agriculture, forestry and fishing industry. In addition, companies in the manufacturing and wholesale industry have lower abnormal working capital accruals compared with the agriculture, forestry and fishing industry.

In order to test whether the potential constraint of Big Four auditors on earnings management is uniform across countries, the regression analysis is performed on the sample of companies with a Big Four auditor and the sample of companies with a non-Big Four auditor separately. The results are presented in Table 6, Panel A and B.

The multivariate analysis in Panel A shows that the country differences remain significant even though all companies are audited by a Big Four audit firm (p<0.01). In other words, the Big Four audit firm quality effect appears not sufficiently strong to remove the effects of national audit environments on earnings management. This finding implies that Big Four audit firms do not constitute a uniform constraint on earnings management. The positive association between a NYSE listing and earnings management is also not eliminated by Big Four auditors, which is not surprising given that nearly all companies in our sample with a NYSE listing are audited by a Big Four audit firm. The OLS regression results for the non-Big Four audit firm sample are presented in Panel B of Table 6. As expected, the country differences remain: companies in France and the UK audited by a non-Big Four audit firm have significantly lower levels of abnormal working capital accruals compared to

German companies audited by a non-Big Four audit firm. While a planned listing on the NYSE is associated with a significantly higher level of abnormal working capital accruals, an actual NYSE listing is not a significant variable in the non-Big Four audit firm sample. This is most likely due to the small sample size of non-Big Four audit firm clients listed at the NYSE.

8. Sensitivity analyses

To test the robustness of our results, we have performed the following sensitivity analyses. First, we have included year dummies in our model. This does not change the results (not reported) for our variables of interest. Second, we have used two additional models to measure accruals: current accruals and total accruals. Following Myers et al. (2003), we measure current accruals as: (change in current assets – change in cash and cash equivalents) – (change in current liabilities – change in short-term debt and current portion of long-term debt). Current accruals are subsequently scaled by average total assets. Following Dechow et al. (1995), we measure total accruals as: (change in current assets – change in cash and cash equivalents) – (change in current liabilities – change in short-term debt and current portion of long-term debt) – depreciation and amortisation. Total accruals are subsequently scaled by prior-year total assets. Table 7, Panel A, presents the results using these two alternative accruals measures. These results show that companies in France and the UK have a significantly lower absolute value of current and total accruals (p<0.01) compared with companies in Germany. This confirms our finding derived from Table 5 that the magnitude of earnings management is not uniform across the three European countries and suggests that a stricter audit environment constitutes a constraint on earnings management. The results further show that companies with a Big Four auditor do not have significantly lower current and total accruals in absolute value, consistent with the results from Table 5. We explore the Big Four auditor quality effect at country level further below. Companies cross-listed on the NYSE appear to have significant higher absolute levels of current and total accruals (p<0.01), which is consistent with the finding in Table 5 for abnormal working capital accruals. However, companies planning a listing on the NYSE do not appear to have a significant different magnitude of current and total accruals. It is recalled that the number of companies in our sample with a NYSE listing, or anticipating a NYSE listing, is low, so caution is needed when generalizing these results. When the regression analysis with current and total accruals as dependent variable is performed on the sample of companies with a Big Four audit firm and the sample of companies with

Table 6
OLS regression results for Big Four and non-Big Four audit firm samples

Panel A: Big 4 audit firm sample

Dependent variable:
Absolute value of abnormal working capital accruals (N = 10,710)

Variables	Parameter estimate	*t*-value	Significance
Constant	0.149	25.187	0.000***
UK	–0.014	–7.797	0.000***
FRA	–0.008	–3.559	0.000***
NYSE	0.017	4.026	0.000***
PYLIST	0.013	1.042	0.298
LNASSETS	–0.006	–15.708	0.000***
GEAR	–0.000	–0.417	0.677
OPCF	–0.048	–12.066	0.000***
SIC10–17	0.028	7.830	0.000***
SIC20–39	–0.008	–3.797	0.000***
SIC50–59	–0.019	–7.853	0.000***
SIC70–89	0.009	3.700	0.000***
Adjusted-R^2	6.4%		
F-value	67.668		0.000***

*p < 0.10, **p < 0.05, *** p < 0.01

Panel B: Non-Big 4 audit firm sample

Dependent variable:
Absolute value of abnormal working capital accruals (N = 6,048)

Variables	Parameter estimate	*t*-value	Significance
Constant	0.144	15.658	0.000***
UK	–0.005	–1.975	0.048**
FRA	–0.011	–4.124	0.000***
NYSE	0.002	0.104	0.917
PYLIST	0.101	2.115	0.034**
LNASSETS	–0.006	–9.552	0.000***
GEAR	0.000	1.545	0.122
OPCF	–0.056	–10.933	0.000***
SIC10–17	0.024	4.113	0.000***
SIC20–39	–0.002	–0.636	0.525
SIC50–59	–0.009	–2.229	0.026**
SIC70–89	0.017	4.392	0.000***
Adjusted-R^2	6.4%		
F-value	38.404		0.000***

*p < 0.10, **p < 0.05, *** p < 0.01

Variable definitions:
UK = Dummy variable (UK company = 1, else 0); FRA = Dummy variable (French company = 1, else 0); $NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0); $PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0); $LNASSETS_t$ = Natural logarithm of total assets in year t; $GEAR_t$ = Ratio of long term debt to common equity in year t; $OPCF_t$ = Cash flow from operating activities in year t scaled by total assets; SIC 10–17= Mining & Construction; SIC 20–39 = Manufacturing; SIC 50–59 = Wholesale trade; SIC 70–89 = Services.

Table 7
Sensitivity analyses

Panel A: OLS regression results for current and total accruals

	Current accruals			Total accruals		
	Pooled sample (N=16758)	Big 4 audit firm sample (N=10710)	Non-Big 4 audit firm sample (N=6048)	Pooled sample (N=16758)	Big 4 audit firm sample (N=10710)	Non-Big 4 audit firm sample (N=6048)
Variables	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)
Constant	0.058 (40.377)***	0.053 (33.292)***	0.066 (21.962)***	0.241 (37.302)***	0.224 (29.103)***	0.274 (21.407)***
UK	−0.007 (−14.958)***	−0.007 (−13.965)***	−0.007 (−7.555)***	−0.034 (−16.016)***	−0.036 (−14.506)***	−0.034 (−8.514)***
FRA	−0.006 (−12.428)***	−0.006 (−10.133)***	−0.006 (−7.153)***	−0.028 (−11.715)***	−0.031 (−10.122)***	−0.023 (−6.190)***
Big4	0.000 (0.507)	n.a.	n.a.	0.001 (0.649)	n.a.	n.a.
NYSE	0.006 (4.416)***	0.004 (3.701)***	−0.007 (0.930)	0.026 (4.424)***	0.020 (3.664)***	0.012 (0.347)
PYLIST	0.005 (1.323)	0.003 (0.849)	0.018 (1.170)	0.026 (1.458)	0.015 (0.892)	0.083 (1.284)
LNASSETS	−0.003 (−28.713)***	−0.025 (−23.625)***	−0.003 (−17.461)***	−0.010 (−21.953)***	−0.008 (−16.719)***	−0.013 (−14.598)***
GEAR	0.000 (0.848)	−0.000 (−0.203)	0.000 (1.176)	0.000 (0.712)	0.000 (0.008)	0.000 (1.090)
OPCF	−0.005 (−21.736)***	−0.005 (−21.058)***	−0.004 (−9.972)***	−0.031 (−11.198)***	−0.010 (−2.493)**	−0.043 (−10.615)***
SIC10–17	0.003 (4.289)***	0.003 (3.250)***	0.005 (3.095)**	0.008 (2.164)**	0.007 (1.577)	0.016 (1.964)*
SIC20–39	−0.000 (−1.011)	−0.001 (−2.484)**	0.001 (1.094)	−0.078 (−3.106)***	−0.009 (−3.550)***	−0.003 (−0.603)
SIC50–59	0.001 (2.745)***	0.001 (1.893)*	0.003 (2.098)**	0.003 (1.038)	0.001 (0.309)	0.008 (1.362)
SIC70–89	0.003 (5.472)***	0.002 (3.166)***	0.005 (4.104)***	0.033 (11.108)***	0.029 (8.430)***	0.039 (6.920)***
Adjusted-R^2	10.9%	11.6%	9.4%	8.4%	6.4%	10%
F-value	157.369***	115.681***	54.941***	117.425***	60.229***	58.222***

*p < 0.10, **p < 0.05, *** p < 0.01, n.a.: not applicable

Variable definitions:
UK = Dummy variable (UK company = 1, else 0);
FRA = Dummy variable (French company = 1, else 0);
$Big4_t$ = Dummy variable (Company has Big Four auditor = 1, else 0);
$NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0);
$PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);
$LNASSETS_t$ = Natural logarithm of total assets in year t;
$GEAR_t$ = Ratio of long term debt to common equity in year t;
$OPCF_t$ = Cash flow from operating activities in year t scaled by total assets;
SIC 10–17 = Mining & Construction;
SIC 20–39 = Manufacturing;
SIC 50–59 = Wholesale trade;
SIC 70–89 = Services.

Table 7
Sensitivity analyses *(continued)*

Panel B: OLS regression results with interaction variables

Variables	Abnormal working capital accruals (N=16758)	Current accruals (N=16758)	Total accruals (N=16758)
	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)
Constant	0.146 (29.532)***	0.057 (38.782)***	0.238 (35.618)***
UK	−0.005 (−2.200)**	−0.006 (−8.225)***	−0.029 (−8.707)***
FRA	−0.011 (−4.487)***	−0.006 (−8.754)***	−0.024 (−7.253)***
Big4	0.002 (1.115)	0.001 (1.308)	0.007 (2.129)**
Big4*UK	−0.009 (−3.094)***	−0.001 (−1.734)*	−0.008 (−2.115)**
Big4*France	0.002 (0.703)	−0.000 (−0.938)	−0.007 (−1.516)
NYSE	0.018 (4.000)***	0.006 (4.422)***	0.026 (4.450)***
PYLIST	0.021 (1.650)*	0.005 (1.311)	0.025 (1.443)
LNASSETS	−0.006 (−18.244)***	−0.003 (−28.625)***	−0.010 (−21.895)***
GEAR	0.000 (0.867)	0.000 (0.891)	0.000 (0.761)
OPCF	−0.051 (−16.417)***	−0.005 (−21.708)***	−0.031 (−11.160)***
SIC10–17	0.026 (8.557)***	0.004 (4.304)***	0.009 (2.173)**
SIC20–39	−0.006 (−3.392)***	−0.000 (−0.984)	−0.007 (−3.110)***
SIC50–59	−0.016 (−7.528)***	−0.001 (−2.673)***	−0.003 (−1.061)
SIC70–89	0.012 (5.646)***	0.003 (5.471)***	0.033 (11.122)***
Adjusted-R^2	6.8%	10.9%	8.4%
F-value	87.712***	135.206***	100.998***

*p < 0.10, **p < 0.05, *** p < 0.01

Variable definitions:
UK = Dummy variable (UK company = 1, else 0);
FRA = Dummy variable (French company = 1, else 0);
$Big4_t$ = Dummy variable (Company has Big Four auditor = 1, else 0);
$NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0);
$PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);
$LNASSETS_t$ = Natural logarithm of total assets in year t;
$GEAR_t$ = Ratio of long term debt to common equity in year t;
$OPCF_t$ = Cash flow from operating activities in year t scaled by total assets;
SIC 10–17 = Mining & Construction;
SIC 20–39 = Manufacturing;
SIC 50–59 = Wholesale trade;
SIC 70–89 = Services.

a non-Big Four audit firm separately, we observe that the country differences in terms of level of earnings management remain significant (p<0.01). This is consistent with the finding derived from Table 6 that country differences remain significant even in the presence of a Big Four audit firm. In other words, the limits placed by Big Four audit firms on earnings management do not appear to be uniform across countries. Given that nearly all companies in our sample with a NYSE listing have a Big Four auditor, it is not surprising that the positive association between a NYSE listing and the level of accruals remains significant (p<0.01) in the subsample of companies with a Big Four audit firm, and not in the subsample of companies with a non-Big Four audit firm.

To explore the Big Four audit quality effect in more detail, we have included two interaction dummies, Big4*UK and Big4*FRA in our model. The results, presented in Table 7 Panel B, show an expected significant negative coefficient for the B4*UK variable with all our accruals measures, while the coefficient for the Big4*FRA variable is not significant for any of the accruals measures.

To further explore these findings, we have conducted a multivariate analysis for the individual country samples. The results are presented in Table 8. At a national level, these results indicate that only in the UK are Big Four audit firms significantly associated with lower levels of accruals. In France and Germany, there is no significant difference between Big Four auditors and non-Big Four auditors. These findings are in line with Francis and Wang (2004), showing that the effect of Big Four audit firm conservatism increases with the level of investor protection, including the ability to sue. Given that the UK has a stronger level of investor protection compared with France and Germany, this could explain why we only observe a Big Four audit firm quality effect in the UK, and not in France and Germany. At the individual country level, we further observe a positive association between a NYSE listing and the level of abnormal working capital accruals in the UK, but not in France and Germany. The latter could be due to lack of power given the very small number of observations with a NYSE listing in France and Germany. Overall, the results of the sensitivity analyses reinforce our findings that national differences in earnings management are dominant and remain significant even in the presence of a Big Four audit firm or a cross-listing on the NYSE.

9. Summary and conclusions

The purpose of this study was to examine the effects of national audit environment differences on earnings management. In addition, the extent to which national differences in earnings management are limited by audit firm quality and reliance on international capital markets was studied.

Our results provide evidence that the magnitude of earnings management is not uniform across the three European countries included in our study and that a stricter audit environment can reduce the magnitude of earnings management, irrespective of the type of auditor (Big Four audit firm or non-Big Four audit firm). In particular, the results suggest that companies in countries with flexible audit quality regimes report significantly higher absolute values of discretionary accruals compared to companies in countries with strict audit quality regimes. These observed EU member states' differences remain significant even in the presence of a Big Four audit firm. This finding implies that the limits placed by Big Four audit firms on earnings management are not uniform across countries. Furthermore, we find no evidence of a global Big Four audit quality effect in Europe. In particular, Big Four audit firm conservatism appears to be present only in the UK, and not in France and Germany. This reinforces our finding that national differences in earnings management are dominant and are not removed by the presence of a Big Four audit firm. This is also consistent with the finding of Francis and Wang (2004) that Big Four auditor conservatism increases in more stringent investor protection environments. Finally, our results with respect to the incidence of earnings management by companies attracting international sources of capital suggest that a NYSE listing does not constraint earnings management but is rather associated with higher levels of accruals. This finding puts the effectiveness of the bonding role of SEC regulation for non-US firms into question. This concern is consistent with other recent empirical work questioning the effectiveness of SEC regulation and its enforcement regarding foreign listed firms (Joos, 2003; Lang et al., 2004).

The evidence provided in this study is relevant for the current debate in the European Union on the harmonisation of auditing. For the comparability of earnings, not only the standardisation of financial reporting is important but also the standardisation of enforcement mechanisms as embodied in the national audit environment and the quality of audit firms. The results of this study suggest that the enforcement of financial reporting still varies strongly across member states of the EU.

The results of this study are subject to the following limitations. First, as in almost every cross-country study, it can be questioned whether the observed differences between countries are really attributable to differences in earnings management. One could argue that they are driven by economic and institutional differences. We have partly controlled for economic differences by including industry differences. In addition, we believe that

Table 8
OLS regression results at country level

	Dependent variable: Absolute value of abnormal working capital accruals		
	France (N=3751)	UK (N=9198)	Germany (N=3809)
Variables	Parameter estimate (t-value)	Parameter estimate (t-value)	Parameter estimate (t-value)
Constant	0.120 (13.070)***	0.136 (22.796)***	0.197 (14.586)***
Big4	0.003 (1.468)	−0.007 (−3.897)***	0.005 (1.474)
NYSE	0.003 (0.392)	0.019 (3.315)***	0.024 (1.451)
PYLIST	0.035 (1.376)	0.023 (1.281)	0.000 (0.025)
LNASSETS	−0.005 (−7.757)***	−0.005 (−11.876)***	−0.009 (−9.656)***
GEAR	0.000 (1.525)	−0.000 (−0.103)	0.000 (0.090)
OPCF	−0.038 (−3.734)***	−0.050 (−13.951)***	−0.092 (−8.858)***
SIC10–17	0.004 (0.673)	0.039 (10.116)***	−0.000 (−0.074)
SIC20–39	−0.005 (−1.357)	−0.005 (−2.226)**	−0.017 (−2.972)**
SIC50–59	−0.015 (−2.987)**	−0.016 (−6.084)***	−0.028 (−3.868)***
SIC70–89	0.007 (1.482)	0.010 (3.695)***	0.041 (5.255)***
Adjusted-R^2	2.7%	8%	9.3%
F-value	11.451***	81.293***	40.301***

*$p < 0.10$, **$p < 0.05$, *** $p < 0.01$

Variable definitions:
$Big4_t$ = Dummy variable (Company has Big Four auditor = 1, else 0);
$NYSE_t$ = Dummy variable (Company is listed on the NYSE = 1, else 0);
$PYLIST_t$ = Dummy variable (Company is listed on the NYSE in $year_{t+1}$ = 1, else 0);
$LNASSETS_t$ = Natural logarithm of total assets in year t;
$GEAR_t$ = Ratio of long term debt to common equity in year t;
$OPCF_t$ = Cash flow from operating activities in year t scaled by total assets;
SIC 10–17 = Mining & Construction;
SIC 20–39 = Manufacturing;
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there are no major differences in the underlying economic situation between the three countries in the sample during the period under study. Therefore, the risk that economic differences have a significant impact on the results is considered to be low. It is acknowledged that there are institutional differences other than national audit environment between the countries under study. As pointed out by Leuz et al. (2003), it is difficult to fully control for the potential impact of other institutional factors since they are often complemen-

tary and as such difficult to disentangle. However, an interesting contribution of our paper is the finding of a significantly different level of earnings management between companies of countries (France and Germany) belonging to the same institutional cluster in terms of level of investor protection (Leuz et al., 2003), but that are clearly distinct in terms of flexibility of the audit quality regime.

Second, consistent with previous research on earnings management, we have controlled for the

following earnings management incentives: size, leverage and performance. Nonetheless, it is acknowledged that there may be other incentives to manage earnings across the countries in the sample that have not been controlled for.

Finally, we are aware of the limitations of the working capital accruals model to detect earnings management. However, we have performed sensitivity analyses using alternative earnings management measures and overall the results appear to be robust.

Future research may benefit from examining whether the extent of earnings management between companies with similar earnings management incentives from different countries across the world differs as a function of auditor independence regulation and risk of litigation in their country of domicile. An attempt in this direction is made by Meuwissen et al. (2004). Future research could also look into the broad issue of the complex interaction between governance, institutional environment and financial reporting quality. It can be argued that financial reporting quality is endogenous and potentially depends on several inter-related factors such as institutional environment, capital markets, corporate governance regime and audit regime.

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