Does Complexity Enable Complicity? Corporate Diversification and Earnings Management: Evidence from European Firms

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Abstract

This paper investigates whether corporate diversification, both international and industrial, provides a favourable environment for earnings management. It also explores whether managers of diversified firms have preferences in terms of earnings management strategies. Using a sample of firms listed on the largest European exchanges, we find that the international distribution of sales is associated with greater manipulation of accruals and sales but with lower manipulation of production costs. We also find that industrial diversification is associated with lower levels of all three earnings management tools. We find strong evidence that the combination of industrial and international diversification increases the level of real activity manipulation both in terms of sales and production costs while it has little effect on accrual manipulation. Our findings suggest that firms' complexity should be examined from different perspectives, as industrial and international diversification have different effects on earnings management. They also show that prior research on this topic provides a myopic view as it does not analyse the impact of diversification on real activity manipulation. Our results provide useful insights to investors by highlighting the impact of corporate diversification on earnings management and thus the accurate estimation of firm value.

Keywords: International Diversification; Industrial Diversification; Accrual Manipulation; Real Activity Manipulation; Earnings Management.

JEL Classification: M41; F23; L25; C33.

1. Introduction

Higher levels of corporate diversification may impact the quality of financial reporting by providing opportunities for greater earnings manipulation, as diversified firms have a higher degree of information asymmetry arising from their more complex structures (Thomas, 2002). Firm complexity requires more resources and expertise to accurately examine earnings that are generated from several industries and countries (Rodríguez-Pérez and van Hemmen, 2010) which may limit corporate transparency (Bushman et al., 2004) and increase the potential for earnings manipulation.

There is, however, an alternative way to view the relationship between corporate diversification and earnings management. Thomas (2002) suggests that corporate diversification may be associated with lower levels of earnings management in terms of accruals manipulation as accruals from various divisions are uncorrelated and may offset each other. Furthermore, managers of diversified firms may structure transactions to manipulate divisional cash flows but as revenues, cost, and cash flows are presented to outsiders on an aggregate basis, these manipulations cannot be detected (Rodríguez-Pérez and van Hemmen, 2010; Subrahmanyam, 1991; Thomas, 2002). This alternative interpretation does not predict a positive relationship between higher levels of corporate diversification and earnings management.

We investigate whether diversification as a corporate strategy, both in terms of geographical distribution of sales (international diversification) and industry variation, provides a favourable environment for earnings management. We make an explicit distinction between international and industrial diversification. We are aware of only three papers that distinguish between these types of corporate diversification (Jiraporn et al., 2008; El Mehdi and Seboui, 2011; Vasilescu and Millo, 2016). These studies all use

a simplistic dummy variable approach to distinguish between purely domestic and internationally diversified firms. We argue that this ignores the complexities and varying degrees of firm-level diversification. We provide a more robust measure of firm's international diversification, focusing on both the extent and breadth of internationalization. We measure the extent of international diversification using foreign sales percentage and the breadth of international diversification using a modified version of the Aggarwal et al (2011) multinational classification system. We then use the Herfindahl index to measure industrial diversification, which captures the degree of industrial diversification within the firm taking into account the relative importance of each industrial segment.

We also provide more robust measures of earnings management strategies than exist in the current literature. We analyse two main earnings management strategies: accrual and real activity manipulation. Existing studies in this area limit their analysis to the former strategy thereby ignoring the most commonly used method to manage earnings – real activity manipulation (Schipper, 1989). Graham et al. (2005) find that firms are more likely to manipulate real economic activities to maintain earnings targets and only use accruals as a last resort. Cohen and Zarowin (2010) state that executives prefer to manipulate real activities rather than accruals for two reasons: firstly, to avoid external monitoring and secondly, to reduce the risk that at a certain point in time, if accrual-based strategies have already been exhausted, they would be left with no other option because real activities cannot be adjusted at or after the end of the reporting period. Therefore, we argue the importance of including real activity manipulation in order to provide a comprehensive analysis of earnings management.

These comprehensive and robust measures of both corporate diversification and earnings management allow us to provide a more thorough investigation into the relationship between them, which is particularly timely given that firms are increasing in size and complexity (O'Hagan-Luff & Berrill, 2016). Using a European perspective from the five largest countries in Europe (France, Germany, Italy, Spain, and the UK) and a sample period from 2007 to 2017, we find that the relationship between earnings management and the degree of firm diversification depends on the type of diversification and on the earnings management strategy. In particular, we find that international diversification is associated with greater manipulation of accruals and sales and lower manipulation of production costs. This may be explained as follows: selling to different world regions makes sales and accrual manipulation easier than manipulating production costs which requires the investment of additional resources in raw materials, storage and safeguarding expenses, for example.

We also find that industrial diversification is associated with lower levels of all three earnings management tools. Moreover, we find strong evidence that the combination of industrial and international diversification increases the level of earnings management through real activity manipulation with little effect on accruals. Previous studies which analyse both international and industrial diversification find a negative relationship with earnings management, but only in the form of accrual manipulation (Jiraporn et al., 2008; El Mehdi and Seboui, 2011; Vasilescu and Millo, 2016). Our study indicates that it is not that firms that are both internationally and industrially diversified have lower levels of earnings management, but that they use different earnings management tools to do it. In fact, companies with high levels of corporate diversification are usually large firms that are under the scrutiny of a larger number of investors. They

may use real activity manipulation rather than discretionary accruals because the latter are easier to detect and can be made public by external monitoring bodies, such as auditors (Zang, 2012). Prior studies, by ignoring real activity manipulation tools, have provided an incomplete analysis of this topic.

Finally, our findings extend previous research, which tends to focus on a single country such as the US or the UK, to a European setting. This allows us to compare the impact of different institutional settings, across EU member states, on our main results. Our main results are confirmed in institutional settings which offer high investor protection while in contexts with lower investor protection we find that firm diversification is not associated with lower production cost manipulation, as is the case in for our main results.

The remainder of this paper is organized as follows. Section 2 frames the study within the context of extant literature and develops the hypotheses. Section 3 describes the sample selection procedure, the data and the models used to test the hypotheses. Section 4 presents the empirical results. Finally, Section 5 concludes the paper, highlighting its main conclusions and contributions.

2. Background and hypothesis development

2.1 Corporate diversification and earnings management

El Mehdi & Seboui (2011) discuss two competing theories in relation to the link between corporate diversification and earnings management. The agency conflict theory predicts that diversified firms are more likely to engage in higher earnings management. In accordance with this theory, diversification increases the agency problems between shareholders and managers and, therefore, highly diversified firms are subject to larger

asymmetric information problems (Burch and Nanda, 2003; Doukas and Pantzalis, 2003; Rajan et al., 2000). Managers of diversified firms have the ability to assess division-level transactions while outsiders can only observe company performance at an aggregate level which may be less transparent and deliver less value-relevant information due to currency translation and account consolidation (El Mehdi & Seboui, 2011). Furthermore, external shareholders of highly diversified firms may not have enough resources, incentives, or access to relevant information to monitor management decisions (Warfield et al., 1995). Likewise, diversification can cause investment misallocation. Evidence suggests that corporate diversification may be associated with a reduction in firm value because diversified firms tend to divert funds from stronger divisions to subsidizing poorly performing divisions, misallocating their investment capital (Tong, 2011). Moreover, highly diversified firms are more likely to make significant investments in research and development (Hage and Aiken, 1970), further increasing information asymmetry and impairing financial reporting transparency (Hall, 2002). Finally, diversified firms may have numerous subsidiaries which can significantly differ from each other in terms of culture, especially among industrially diversified firms which are also geographically diversified (El Mehdi & Seboui, 2011). In fact, operations of firms located at greater distances can be particularly difficult to monitor especially if there are large cultural differences (Sambharya, 1996). Therefore, cultural issues may further amplify agency problems and earnings management issues.

The second theory discussed by El Mehdi & Seboui (2011), the earnings volatility theory, proposes that corporate diversification will result in lower variability of earnings as earnings generated from the firm's various divisions are not perfectly correlated. Therefore, earnings management through accruals is limited because managers undertake

earnings manipulation at segment level, and because such accruals are not perfectly correlated, they tend to cancel each other out. The limitation of this theory is that it assumes that earnings cannot be manipulated using methods other than accruals.

These theories follow a similar approach to Thomas (2002) who also provides two competing theories to explain the link between earnings management and firm diversification. His first theory, the information diversification theory, states that company diversification is not related with earnings manipulation because business divisions of diversified firms are uncorrelated, as are their accruals which tend to compensate each other, in line with the earnings volatility theory. The second is the transparency theory, which claims that diversified firms are associated with a higher degree of earnings manipulation because of a higher level of information asymmetry coming from more complex structures, in line with the agency conflicts theory.

Rodríguez-Pérez and van Hemmen (2010) find empirical support for the transparency/agency conflicts theory in Spain showing that highly diversified firms with a significant amount of debt exhibit higher earnings management. In a US setting, El Mehdi and Seboui (2011) find mixed results. They show that international diversification and the combination of international and industrial diversification increases earnings management, in line with the agency conflicts theory, but that industrial diversification decreases it, consistent with the earnings volatility theory. Jiraporn et al. (2008) find support for the alternative theory and, investigating US companies, show that industrial diversified firms and those with a combination of international and industrial diversification have lower levels of earnings management. They also suggest that international diversification alone does not impact on earnings management. Similarly, Vasilescu and Millo (2016) find that industrial diversification mitigates earnings

management among UK targets of mergers or acquisitions. They also find that a combination of international and industrial diversification is associated with a lower degree of earnings management.

2.2 Earnings management strategies

However, the papers above suffer from a significant limitation: they measure earnings management using only proxies for accrual manipulation, thus ignoring the alternative strategy available to managers: real activity manipulation. The accounting literature classifies earnings manipulation tools into two types: accrual manipulation and real activity manipulation (Schipper, 1989). Accrual manipulation can be described as the "abuse" of accounting policies and judgements allowed by the generally accepted accounting principles (Dechow and Skinner, 2000; Gunny, 2010). It is usually related to those accounting items which are not directly linked to an immediate cash flows and that require estimations such as provisions, amortization, impairment, and depreciation. On the other hand, real activity manipulation is related to structuring business transactions in a way that does not reflect normal or optimal economic decisions but with the only goal of affecting financial results. Selling goods under favourable conditions to report higher sales, deferring marketing, R&D, and maintenance costs to exhibit short-term operating income increases may represent examples of real activity manipulation (Roychowdhury, 2006).

Zang (2012) claims that managers use real activity manipulation and accrual management as substitutes, weighing up the cost-benefit trade-offs associated with each. However, the implementation and the effects of these two strategies is very different. Accrual management is quite straightforward to carry out and usually takes place close

to the reporting date, when managers know whether earnings management is needed or not. This strategy is, however, easy to detect and can be made public by external monitoring bodies, such as auditors, when reviewing companies' accounting policies and estimations (Zang, 2012). In contrast, real activity manipulation does not necessarily result in a departure from the accounting standards; therefore, it is more difficult to detect, because auditors, regulators and other monitoring bodies are not in a position to judge the economic decisions of companies (Zang, 2012). However, real activity manipulation can be potentially costly for companies as it involves the implementation of transactions that may not be optimal from an economic point of view (Bhojraj et al., 2009; Chen et al., 2009).

Graham et al. (2005) find that managers feel more confident using real activity manipulation than accrual management. Their survey reveals that accrual manipulation is used by firms only as a last resort because managers prefer real activity manipulation as it reduces external monitoring risk and avoids a situation where it is no longer possible to use discretionary accruals to the extent to which they would like, leaving them with no other options. Real activity manipulation cannot take place after the end of the reporting period (Cohen and Zarowin, 2010).

2.3 Hypothesis development

Building on the literature discussed above, this paper investigates the effect of corporate diversification on earnings management strategies, disentangling corporate diversification into international diversification and industrial diversification and using more sophisticated measures of diversification. In addition, this research investigates the

effect of corporate diversification on both types of earnings management strategies, real activity manipulation and accrual manipulation, in contrast to prior research in this area.

Because of the presence of competing theories and mixed results in previous studies, we state our hypotheses in the null form as follows:

H1: The degree of international diversification is not associated with earnings management.

H2: The degree of industrial diversification is not associated with earnings management.

H3: The combination of international and industrial diversification is not associated with earnings management.

3. Methodology

3.1 Sample

Our sample period runs from 2007 to 2017. The starting date is determined by the introduction of the mandatory use of International Financial Reporting Standards (IFRS) for the preparation of separate and consolidated financial statements for all companies listed on any European financial market.[1] By using only IFRS data, we minimise the possibility that our results are affected by country-specific differences in accounting standards. We select all non-financial companies listed at any time during our sample period from the five largest countries in Europe, namely, France, Germany, Italy, Spain, and the UK. [2] This results in an initial sample of 6,774 firms. After excluding firms with missing data, the final sample contains 3,060 firms (18,893 firm-year observations) across five countries as follows: 574 (3,808) from France, 581 (3,681) from Germany,

[1] Although IFRS are used for the preparation of consolidated financial statements since 2005, we select 2007 as our starting point because the estimation of some of our variables require financial data from t-2.
[2] UK, Germany, France, Italy and Spain occupy the first five positions in terms of nominal GDP in the EU in 2018. Their aggregate GDP accounts for over 70% of the total European Union GDP (IMF 2019).

249 (1,737) from Italy, 126 (954) from Spain, and 1,530 (8,713) the UK. We source all data from Thompson Reuters Eikon.

3.2 Earnings management proxies

3.2.1 Accrual manipulation

Accrual manipulation is estimated using discretionary accruals based on the DeFond and Park (2001) methodology. Although the literature often estimates discretionary accruals using Jones-type models (Jones, 1991; Kothari, Leone, & Wasley, 2005), there is evidence that these models contain biased parameters estimates that could potentially induce erroneous conclusions on the existence of earnings management (Bernard and Skinner, 1996; Healy 1996, Kim et al., 2003). Evidence also suggests that they are not reliable where the number of observations per year/industry is limited (Wysocki, 2004) as is the case for some of the countries included in our analysis. Abnormal working capital accruals (AWCA) based on the DeFond and Park (2001) methodology are free from these potential measurement errors and have been used in countries with small financial markets (Cameran et al., 2014). Recent papers also question the use of residuals in the estimation of accruals following the Jones (1991) model methodology, i.e., discretionary accruals coming from first-stage models and used as dependent variables in second-stage models. Chen, Hribar, and Melessa (2018) state that this procedure is likely to result in biased coefficients and standard errors, and Christodoulou, Ma, and Vasnev (2018) highlight that such biases are not related to model specification but, rather, to limitations of the statistical method. They also argue that the use of residuals in a second stage regression of economic determinants of earnings management perform

poorly when residuals are estimated by industry classification in the first stage. As a result, our AWCAs are not estimated using residuals of first stage models.

DeFond and Park (2001) define AWCAs as the difference between the current year's actual working capital accruals and their expected level for firm i in year t:[3]

$$AWCA_{it} = WC_{it} - (WC_{it-1}/S_{it-1})* S_{it} \qquad (1)$$

Variables are defined in Appendix A. We use the absolute value of AWCA (*ABSAWCA*) to analyse discretionary accruals in line with studies that have no a priori expectations about the direction of discretionary accruals (Bartov, Gul, & Tsui, 2000).

3.2.2 Proxy for real activity manipulation

We estimate two types of real activity manipulation, sales and production cost manipulation, using the methodology developed by Roychowdhury (2006) since revenues, receivables, cost of goods sold and inventory are found to be the most frequently managed items in companies' annual reports (Dechow et al. 2011; Ricci 2011). Following Roychowdhury (2006), sales manipulation is estimated using a cross-sectional regression. We estimate the normal level of cash flow to assets given reported sales based on the following equation (2):[4]

$$CFO_{it} = \alpha + \beta_1(1/A_{it-1}) + \beta_2 REV_{it} + \beta_3 \Delta REV_{it} + \varepsilon_{it} \qquad (2)$$

Variables are defined in Appendix A. We define the abnormal cash flow (*ABNCFO)* as the residuals from the model presented above and use their absolute values (*ABSABNCFO*) in our analyses.

[3] The full explanation of this formula is reported in the appendix of the DeFond and Park (2001) paper, p. 401-402.

[4] The detailed development of these models can be found in Roychowdhury (2006).

Concerning production cost manipulation, Roychowdhury (2006) notes that if companies increase their production level, fixed overheads are allocated to a larger number of items with a consequent reduction in the fixed costs per unit, which will reduce reported cost of goods sold and increase firms' operating profit. Thus, following Roychowdhury (2006), we estimate the normal level of production costs production using the following equation (3):

$$PROD_{it} = \alpha + \beta_1(1/A_{it-1}) + \beta_2 REV_{it} + \beta_3 \Delta REV_{it} + \beta_4 \Delta REV_{it-1} + \varepsilon_{it} \quad (3)$$

Variables are defined in Appendix A. We define abnormal production costs (*ABNPROD*) as the residuals of the model reported above and use their absolute values (*ABSABNPROD*) in our analyses.

3.3 Measures of corporate diversification

3.3.1 Geographical distribution of sales (or international diversification)

Prior studies investigating the effect of international diversification on earnings manipulation (Jiraporn et al., 2008; El Mehdi & Seboui, 2011; Vasilescu & Millo, 2016) use a simplistic dummy variable approach to distinguish between purely domestic and internationally diversified firms. Jiraporn et al. (2008) categorise firms as international if they report sales in more than one country while El Mehdi & Seboui (2011) categorise firms as international if at least 10 percent of their sales occur overseas. This approach fails to capture the complexities of the international distribution of sales of firms and the vast spectrum of firm internationalization ranging from a firm exporting to a neighbouring country to a firm with extensive operations in countries and regions across the globe.

To capture this complexity, we use two measures of a firm's level of international diversification, measuring both the extent and breadth of its internationalisation. Foreign sales as a percentage of total sales gives a robust quantitative measure of a firm's overall level of internationalisation but does not provide any information about where those sales occur. Indeed, a firm may have a high percentage of foreign sales, but those sales may be spread across many countries or all occur in a neighbouring country. For example, in 2014, Ashtead Plc, a UK-based firm reported 84 percent foreign sales across two regions, the UK and North America, while Aggreko Plc reported just 59 percent foreign sales despite having sales in Europe, Asia, Africa, Oceania and both North and South America. Aggreko Plc has a far greater breadth of internationalisation which increases the complexity of managing business units across different continents, currencies and cultures as well as different regulatory, legal and accounting environments.

We measure the breadth of a firm's internationalisation using a modified version of the multinational classification system proposed by Aggarwal et al. (2011). Following this methodology, we divide the world into six geographic regions: Africa, Asia, Europe, North America, Oceania and South America. We give each firm a score in each year based on the location of its sales. Thus, if a firm has no foreign sales it is given a score of 0 (domestic); if it has sales outside its home country but within its home region, it is given a score of 1 (regional); if it has sales in its home country plus one other region it is given a score of 2; if it has sales in its home country plus two other regions it is given a score of 3 and so on until a maximum score of 6, which indicates that a firm has sales in all 6 regions of the world.

In addition to the multinational classification based on the Aggarwal et al. (2011) system, we measure the extent of a firm's internationalisation using its percentage foreign sales (*FS*).

3.3.2 Industrial Diversification

Most previous studies use a dummy variable approach to measure industrial diversification, separating firms that report one industrial segment from firms reporting multiple segments (Rodríguez-Pérez & van Hemmen, 2010; El Mehdi & Seboui, 2011). Following Jiraporn et al. (2008) and Rodríguez-Pérez & van Hemmen (2010), we measure industrial diversification using the Herfindhal index, which captures the degree of industrial diversification within the firm taking into account the relative importance of industrial segments, thus providing a more accurate ranking of firms than the dummy variable approach. We calculate the Herfindahl index for each firm i in year t as:

$$IND_{it} = \sum_{i=1}^{t} \left(\frac{SSale}{Sale}\right)^2 \qquad (4)$$

Variables are defined in Appendix A. The variable *IND* equals 1 for single-segment firms and less than 1 for multiple-segment firms, thus, the smaller the index, the higher the degree of industrial diversification. For ease of interpretation, we multiply *IND* by -1, thus a higher value indicates a higher level of industrial diversification.

3.4 Earnings management and corporate diversification: the model

We use the following models to estimate the relationship between earnings management, industrial diversification and international diversification:

$$EM_{it} = \alpha + \beta_1 MULTI_{it} + \beta_2 IND_{it} + \beta_4 SIZE_{it} + \beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + \beta_8 GROWTH_{it} + \beta_9 EISSUE_{it} + \beta_{10} DISSUE_{it} + \beta_{11} LOSS_{it} + \beta_{12} BIG4_{it} + \varepsilon_{it} \quad (5a)$$

$$EM_{it} = \alpha + \beta_1 MULTI_{it} + \beta_2 IND_{it} + \beta_3 MULTI*IND_{it} + \beta_4 SIZE_{it} + \beta_5 CFO_{it} + \beta_6 LEV_{it} + \beta_7 ROA_{it} + \beta_8 GROWTH_{it} + \beta_9 EISSUE_{it} + \beta_{10} DISSUE_{it} + \beta_{11} LOSS_{it} + \beta_{12} BIG4_{it} + \varepsilon_{it} \quad (5b)$$

Variables are defined in Appendix A. The sign and the significance of β_1 and β_2 from model (5a) provide evidence to test our H1 and H2. In particular, a positive (negative) β_1 indicates that higher geographical diversification is associated with higher (lower) levels of earnings manipulation. Similarly, a positive (negative) β_2 indicates that more industrially diversified firms are associated with higher (lower) levels of earnings manipulation. Model (5b) includes an interaction term between our measures of geographical and industrial diversification. The sign and the significance of β_3 provides evidence to test our H3. A positive (negative) and significant β_3 suggests that the combination of geographical and industrial diversification is associated with higher (lower) levels of earnings manipulation.

In line with previous studies on earnings management, models (5a) and (5b) include control variables such as firm size (Park and Shin 2004; Roychowdhury, 2006), cash flow from operations and profitability (Kothari et al. 2005), firm leverage (Dechow et al. 1995), growth (Carey and Simnett, 2006), issuance of debt or equity (Shan et al., 2013), the presence of losses (Burgstahler and Dichev, 1997) and the type of auditor (Eshleman and Guo, 2014).

We estimate models (5a) and (5b) using OLS. Our parameter estimates are calculated using robust standard errors. All continuous variables are winsorised at the 1st

and 99th percentile to avoid findings being biased due to the presence of outliers. The models also include year, industry and country dummies.

4. Results

4.1 Descriptive statistics and univariate analyses

Descriptive statistics are reported in Table 1.

[Insert Table 1 here]

The average firm in our sample has 44 percent foreign sales, operates in 2.52 of the 6 regions of the world and has a Herfindahl index of -0.65. On average, Spanish and German firms are more international than the other countries, using both the percentage of foreign sales and the ABHK score. UK firms, are, on average, the least industrially diversified. In terms of earnings management, Germany and the UK have the highest values of accruals and real activity manipulation. Companies in the sample have, on average, positive levels of ROA and cash flow although approximately 29% have generated losses. They issue, on average, more debt than equity and exhibit an average growth, in terms of sales, of about 6.6%. In relation to the auditing of the annual reports, the majority of firms in the sample are Big 4 clients, particularly those operating in Italy.

Table 2 lists the pairwise correlation coefficients between our variables.

[Insert Table 2 here]

All three proxies for of earnings management are negatively correlated with our measures of international and industrial diversification indicating that earnings management is lower, the more internationally and industrially diversified the firm. The correlations between all three earnings management measures are positive and

significant. Our two measures of international diversification, *ABHK* and *FS*, are positively correlated with each other, as would be expected, and both are also positively correlated with industrial diversification. Table 2 exhibits several significant correlations between variables included in the regression models. Therefore, only a multivariate analysis can provide statistically reliable evidence to test the hypotheses.[5]

4.2 Regression analysis

The results from equations (5a) and (5b) are presented in Table 3. We list results for our three measures of earnings management, *ABSAWCA*, *ABSABNCFO* and *ABSABNPROD* in three consecutive panels. For each dependent variable, we list the results of four regression models. Model 1 and 2 represent equation (5a), with model 1 using *ABHK* as our measure of international diversification and model 2 using *FS*. Models 3 and 4 represent equation (5b), including an interaction term of each measure of internationalisation multiplied by the Herfindahl index.

[Insert Table 3 here]

For *ABSAWCA*, the coefficient for *ABHK* and *FS* is positive and significant at the 1% level ($\beta = 0.001$, p-value = 0.000 and $\beta = 0.012$, p-value = 0.000, respectively). This indicates that accrual manipulation increases with the level of international distribution of sales of companies. *IND* is negative and significantly associated with *ABSAWCA* both in models (1) and (2) ($\beta = -0.011$, p-value = 0.000) which suggests that accrual manipulation decreases among industrially diversified firms.

[5] A diagnostic test for multicollinearity through the estimation of the variance inflation factor (VIF) coefficients for all regressions was carried out. The VIF coefficients are always below the threshold of 10 (Kennedy, 2008).

We find that different types of diversification have different effects on accrual manipulation. Our findings for international diversification support the agency conflicts theory while our findings for industrial diversification provide support for the earnings volatility theory. These contrasting results can be explained as follows. Firms with higher levels of international sales deal with more complex transactions involving, for example, currency translation, overseas customers and multiple credit policies, which creates more opportunities for accrual manipulation. On the other hand, firms operating in different industries are more likely to be affected by the earnings volatility theory since accrual decisions made at division level by managers may compensate each other once the accounts are consolidated.

Models 3 and 4 introduce an interaction term between our measures of international and industrial diversification. The coefficients associated with *ABKH*, *FS* and *IND* are consistent with the other models. However, the interaction term is positive and significant for *FS*IND* at the 10% level ($\beta = 0.012$, p-value = 0.067). This suggests that companies that are internationally and industrially diversified exhibit some evidence of higher levels of accrual manipulation. This is in accordance with the agency conflicts theory that posits that the complexity of companies increases earnings management (El Mehdi & Seboui, 2011).

Panel B of Table 3 focuses on sales manipulation. Consistent with Panel A, *ABHK* and *FS* are positively and significantly associated with *ABSABNCFO* in all models. This suggests that the extent of sales manipulation increases with the extent and the breadth of international sales of firms. On the other hand, *IND* is always negatively associated with *ABSANCFO* which indicates that industrial diversification reduces the level of manipulation carried out through sales. This is fully consistent with Panel A

which indicates that international and industrial diversification follow different logics. The former behaves in accordance with the agency conflict theory while the latter follows the earnings volatility theory in line with previous studies on this topic (El Mehdi & Seboui, 2011; Vasilescu and Millio, 2016). As explained above, it is not surprising that companies with customers in several countries exhibit higher sales manipulation because it is exactly these situations that give more room to managers to manipulate sales.

The interaction terms are positively and strongly significantly associated with *ABSABNCFO* both in models (3) and (4). This indicates that the complexity of the firm, through its international and industrial diversification, increases the extent of earnings manipulation carried out through sales. This result is contrary to previous studies that find that a combination of geographical and industrial diversification decreases earnings manipulation (Jiraporn et al., 2008; El Mehdi & Seboui, 2011; Vasilescu and Millio, 2016). The explanation of this result may be related to the type of earnings management tool investigated, as these studies do not investigate real activity manipulation. Thus, our results indicate that the combination of international and industrial diversification may decrease discretionary accruals, as we observe in Panel A of Table 3, but have a significant impact on other earnings management tools, such as sales manipulation, which was not captured by previous studies.

Panel C of Table 3 presents the results related to production cost manipulation. In Models 1 and 2 we observe that both our measures of international diversification, *ABHK* (β = -0.003, p-value = 0.000) and *FS* (β = -0.017, p-value = 0.000), are negatively associated with *ABSABNPROD,* indicating lower levels of production cost manipulation for increased level of multinationality. This result is contrary to what we observe in Panels A and B. However, if we focus on the earnings management tool being

considered, this evidence is not surprising. Dealing with international customers gives rise to more complex sales terms and transactions which provide greater opportunities for sales manipulation and accrual manipulation. Higher levels of sales in different parts of the world should not have an impact on production cost manipulation since it is related to production processes rather than to the location of the final sales. The variable *IND* is consistently negative and significant related with production cost manipulation, in line with the earnings volatility theory.

When we move to model 3 and 4, we observe that *IND* remains negative and significant, but the interaction terms are both positively and significantly related with *ABSABNPROD*. This suggests that the combination of industrial and international diversification is positively associated with higher earnings manipulation through production costs although these factors in isolation are not. This result indicates that in the presence of the highest level of complexity i.e., international and industrial diversification, managers use real earnings manipulation tools extensively rather than accrual manipulation. Accordingly, previous evidence indicating that the combination of international and industrial diversification is associated with lower earnings management (Jiraporn et al., 2008; Vasilescu and Millo, 2016) may be due to the fact that those studies only employed accrual manipulation proxies.

Overall, our findings indicate that the relationship between company diversification and earnings manipulation depends on the type of earnings management strategy and the type of diversification. We find that the extent and breadth of sales generated abroad is related to higher earnings manipulation carried out through accruals and through sales and to lower levels of production cost manipulation. We also find that industrial diversification is associated with lower levels of all earnings manipulation

strategies. Our interaction terms show that earnings management is amplified when firms are both internationally and industrially diversified, mainly through real activity manipulation. We conclude that the more complex firms are, in terms of both international and industrial diversification, the more they manipulate earnings through real activity transactions, in line with the agency conflict theory. This aspect has not been captured by previous studies as they exclude the analysis of earnings management carried out through business transactions.

The sign and significance of the control variables are as expected from extant literature. They consistently indicate that earnings management is significantly higher among small firms (Park and Shin 2004), poorly performing firms (Kothari et al. 2005), firms with higher level of leverage (Dechow et al. 1995) and growth (Carey and Simnett, 2006) and companies that raised capital both through equity or debt (Shan et al., 2013). Companies exhibiting losses have higher accrual manipulation and lower real activity manipulation because firms in financial difficulties find the latter strategy to be costlier than the former (Zang, 2012). Finally, Big 4 clients are related to less accrual manipulation and more real activity manipulation because Big 4 firms have more expertise in constraining earnings manipulation undertaken through accounting practices (accrual manipulation) while, as any other monitoring body, they are not in a position to judge the economic transactions of the firms (Zang, 2012).

4.3 Additional analyses

4.3.1 The impact of the institutional setting

It is important to consider the institutional setting in which companies operate to understand earnings management behaviours (Leuz et al., 2003) as countries that ensure

strong outsiders' rights reduce insiders' incentives to engage in earnings manipulation (Enomoto et al., 2015).

Traditionally, the impact of the institutional settings on companies' behaviours has been investigated looking at the legal origin of the countries where firms are located (i.e. common law versus code law countries). However, more complete proxies have been developed over time such as the "antidirector rights index" (ADRI), introduced by LaPorta et al. (1998). In contrast to the common law/code law classification, the ADRI measures investor protection under different perspectives. It assesses six aspects of the institutional environment, three related to shareholder voting (voting by mail, voting without blocking of shares, and calling an extraordinary meeting) and three related to minority protection (proportional board representation, pre-emptive rights, and judicial remedies) (Spamann, 2009).

To investigate the impact of the strength of the institutional setting on our results, we use the ADRI developed by Spamann (2009), which ranks countries from 1 (low investor protection) to 5 (high investor protection). Using this information, we create a dummy variable, *ADRI*, which takes the value of 1 for countries with an ADRI higher than the median of our sample and 0 otherwise. Spain and the UK have ADRI scores above the median while France, Germany and Italy have scores below the median. We rerun our models separately for countries with an ADRI above and below the median of the sample. The results are presented in the Tables 4 and 5.

[Insert Table 4 and 5 here]

Table 4 lists the results for countries with an ADRI score higher than the median of the sample. Panel A focuses on accrual manipulation and show results that are generally in line with Table 3. Indeed, it indicates that higher levels of international

diversification are related to higher accrual manipulation while the more industrially diversified firms are associated with lower earnings manipulation. The combination of geographical distribution of sales and industrial diversification has, however, no additional effect on accrual manipulation.

Results for sales manipulation are reported in Panel B of Table 4. In line with our main analysis, we find strong evidence that the level of geographical sales is associated with higher level of sales manipulation while industrial diversification is associated with lower levels of earnings management carried out through sales. The combination of high international and industrial diversification is strongly associated with sales manipulation.

Panel C of Table 4 focuses on the relationship between production cost manipulation and firm diversification operating in countries with high levels of investor protection. The evidence indicates that, where significant, geographical distribution of sales is associated with lower level of earnings manipulation carried out through production costs. The same result is observed for high levels of industry diversification. The combination between geographical distribution of sales, measured by *ABHK*, and industrial diversification is related to higher production cost manipulation.

Overall, the results for countries with higher levels of ADRI mirror those of our main analysis. They indicate that higher levels of geographical dispersion of sales are associated with higher accrual and sales manipulation, but lower earnings management carried out through production costs while industrial diversification is associated with lower levels of all types of earnings management.

Table 5 repeats the analysis for countries with an ADRI below the median of the sample. Panel A reports the results for accrual manipulation, which is positively and significantly related to FS, but not ABHK, and consistent with the main findings, the

results indicate lower levels of accrual manipulation among industrially diversified firms. Finally, we do not find any impact of the combination of geographical distribution of sales and industrial diversification on the extent of discretionary accruals.

As far as sales manipulation is concerned, Panel B of Table 5 confirms, overall, what we have observed above: higher levels of geographical diversification are related to higher levels of sales manipulation, while industrial diversification is negatively related to the extent of sales manipulation. The combination of these factors increases the extent of earnings management carried out through sales.

Panel C focuses on production cost manipulation. While in previous tests we found a strongly negative association between the level of production cost manipulation and international and industrial diversification individually, in this case, we find no significant relationship with international diversification and only a weak negative association with industrial diversification. This finding is in line with studies that find that contexts with lower investor protection create grounds for more earnings management or, as in our case, do not offer the right setting for lower earnings management (Leuz et al., 2003) through production costs. We do not find any significant effect of either interaction term on production cost manipulation.

4.3.2 Robustness tests

It may be argued that firms may employ accrual and real activity manipulation, to a certain extent, at the same time. Accordingly, we repeat our regressions using a model that includes all of our proxies for accrual and real activity manipulation (*ABSAWCA*, *ABSABNCFO* and *ABSABNPROD*) using a panel system equation. This approach considers these earnings management strategies as interdependent and not mutually

exclusive (Liu, Hodgkinson, and Chuang, 2014) reflecting the actual dynamics observed in real firms. The evidence from this test supports our main findings highlighted in Table 3.

As a further robustness test, we use an alternative measure of industrial diversification. In particular, we created a dummy variable that takes a value of 1 if the firm operates in more than one industrial segment and 0 otherwise. Once again, we find consistent evidence that the level of industry diversification is associated with lower levels of earnings management, regardless of the earnings management tool investigated[6].

5. Conclusions

With increasing globalization and the reduction of many previous costs and barriers to international trade, firms are becoming increasingly complex, operating in many different countries and regions, and across several industry categorizations. Complex firm structures may give rise to more opportunistic behaviours and more pervasive earnings management, which can compromise financial reporting quality. Alternatively, corporate diversification may cause earnings management strategies in different divisions to cancel out which would result in an overall neutral effect on financial reporting quality.

We investigate whether corporate diversification across industries and regions, and the combination of the two, influences earnings management. In contrast to previous research, we investigate both accrual and real activity manipulation strategies and use more sophisticated measure of corporate diversification. Using a large sample of firms

[6] These tests are available from the authors upon request.

operating in the five largest European countries, we find evidence that the relationship between earnings manipulation and the degree of firm diversification depends on the type of the earnings management strategy investigated. We find that the international distribution of sales is associated with higher levels of accrual and sales manipulation and lower levels of production cost manipulation. We also observe that highly diversified firms exhibit lower levels of earnings manipulation for all types of earnings management. Finally, we find that the combination of international and industrial diversification increases the level of real activity manipulation through sales and production costs with no effect on accrual manipulation. We further analyse the impact of countries' institutional settings and find that in institutional settings that afford lower investor protection higher levels of firm diversification are not associated with lower levels of production cost manipulation, as is the case for our main results.

The findings from this study have several implications. We contribute to previous research on this topic by investigating several earnings management strategies and using more accurate measures of firm-level diversification. They indicate that the effect of corporate diversification on earnings management in not homogeneous both in relation to the type of diversification and in relation to the earnings management strategy investigated. Accordingly, firms' complexity should be examined using different perspectives, as industrial and international diversification have been shown to have different effects. Similarly, earnings management must be assessed using several earnings management options available to managers. Highlighting that the combination of international and industrial diversification increases the level of earnings manipulation through real activities, we contribute to prior research that finds that corporate diversification reduces earnings manipulation, but crucially lack the inclusion of real

activity manipulation strategies. Our findings also highlight which type of diversification is more detrimental to financial reporting quality and which earnings management strategy is more likely to be affected. They also confirm that any investigation of earnings manipulation by firms should consider the impact of the institutional setting on the ability of managers to manipulate earnings. Our results provide interesting insights for investors, showing that firm complexity may significantly impact earnings manipulation and, thus the accurate estimation of firm value.

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Appendix A. Variable definitions (in alphabetical order)

A: Firm total assets.

ABHK: measure of the breadth of firm internationalization as described in section 3.3.1.

ABSABNCFO: Absolute value of abnormal cash flow calculated as residuals of model (3) multiplied by minus 1.

ABSABNPROD: Absolute value of abnormal production cost calculated as residuals from model (4).

ABSAWCA: Absolute value of discretionary working capital accruals based on the methodology developed by DeFond and Park (2001).

ABNCFO: Abnormal cash flow calculated as residuals of model (3) multiplied by minus 1.

ABNPROD: Abnormal production cost calculated as residuals from model (4).

AWCA: Discretionary working capital accruals based on the methodology developed by DeFond and Park (2001).

BIG4: A value of 1 if the company is audited by a Big 4 audit firm (i.e. Deloitte, Ernst & Young, KPMG, PricewaterhouseCoopers) and 0 otherwise.

CFO: Cash flows from operations scaled by beginning total assets.

DISSUE: Annual change in total liabilities scaled by beginning total assets.

EISSUE: Annual increase in own's capital scaled by beginning total assets.

EM: *ABSAWCA, ABSABNCFO or ABSABNPROD*, in turn.

FS: Firm's foreign sales as a percentage of total sales.

GROWTH: Percentage of annual change in revenue scaled by beginning total assets.

IND = Industrial diversification of the firm.

LEV: Total liabilities divided by total assets.

LOSS = A value of 1 if the company generated a loss and 0 otherwise.

MULTI = International diversification of the firm, *ABHK* or *FS*.

PROD: Cost of goods sold plus the change in inventory divided by beginning total assets.

REV: Net revenues scaled by beginning total assets.

ΔREV: Change in revenues scaled by beginning total assets.*ROA*: Net income before extraordinary items scaled by beginning total assets.

S: Firm net revenues.

Sale: Total sales for all reported segments.

SSale: Segment sales of the firm.

SIZE: Natural logarithm of total assets.

WC: Non-cash working capital accruals, calculated as (current assets – cash and short-term investments) – (current liabilities – short-term debt);

Table 1. Descriptive statistics

Panel A. Full sample

	N.	Mean	Median	St. Dev	1st Quartile	3rd Quartile
ABSAWCA	18,893	0.063	0.033	0.083	0.014	0.074
ABSCFO	18,893	0.090	0.055	0.104	0.025	0.114
ABSPROD	18,893	0.181	0.130	0.174	0.060	0.242
ABHK	18,893	2.522	2.000	1.792	1.000	4.000
FS	17,289	0.444	0.443	0.339	0.102	0.744
IND	18,893	-0.652	-0.595	0.264	-0.989	-0.431
SIZE	18,893	12.358	12.207	2.335	10.768	13.906
CFO	18,893	0.043	0.067	0.157	0.017	0.113
LEV	18,893	0.562	0.559	0.258	0.393	0.708
GROWTH	18,893	0.066	0.039	0.189	-0.025	0.136
EISSUE	18,893	0.117	0.055	0.069	-0.053	0.165
DISSUE	18,893	0.134	0.030	0.521	-0.075	0.180
ROA	18,893	0.017	0.052	0.185	0.002	0.096
LOSS	18,893	0.286	0.000	0.452	0.000	1.000
BIG4	18,893	0.668	1.000	0.471	0.000	1.000

Panel B. Country averages

	France	Germany	Italy	Spain	UK
ABSAWCA	0.048	0.068	0.061	0.056	0.069
ABSCFO	0.069	0.084	0.055	0.060	0.112
ABSPROD	0.139	0.181	0.142	0.131	0.213
ABHK	2.621	2.799	2.387	2.768	2.363
FS	0.436	0.474	0.425	0.480	0.433
IND	-0.609	-0.588	-0.599	-0.620	-0.711
SIZE	13.007	12.714	13.310	13.888	11.567
CFO	0.053	0.056	0.051	0.061	0.029
LEV	0.597	0.564	0.645	0.639	0.522
GROWTH	0.051	0.061	0.024	0.034	0.088
EISSUE	0.098	0.092	0.035	0.083	0.156
DISSUE	0.083	0.107	0.057	0.084	0.190
ROA	0.028	0.022	0.019	0.037	0.007
LOSS	0.236	0.233	0.320	0.235	0.330
BIG4	0.659	0.629	0.858	0.769	0.638

Notes: In Panel A we list descriptive statistics for all of our variables, as defined in Appendix A. In Panel B we list the average value of each variable across each country included in our analysis.

Table 2. Correlation table

	ABSAWCA	ABSCFO	ABSPROD	ABHK	FS	IND	SIZE	CFO	LEV	GROWTH	EISSUE	DISSUE	ROA	LOSS
ABSAWCA														
ABSCFO	0.302***													
ABSPROD	0.149***	0.335***												
ABHK	-0.098***	-0.103***	-0.121***											
FS	-0.022***	-0.015**	-0.095***	0.586***										
IND	-0.133***	-0.230***	-0.136***	0.233***	0.098***									
SIZE	-0.325***	-0.398***	-0.253***	0.305***	0.199***	0.334***								
CFO	-0.301***	-0.389***	-0.104***	0.118***	0.013*	0.157***	0.344***							
LEV	0.190***	-0.060***	0.014*	-0.016**	-0.060***	0.156***	0.212***	-0.068***						
GROWTH	0.048***	0.155***	0.207***	-0.021***	-0.019**	-0.042***	-0.052***	0.116***	-0.039***					
EISSUE	-0.022***	0.145***	0.079***	-0.001	0.007	-0.038***	-0.021***	0.058***	-0.144***	0.243***				
DISSUE	0.081***	0.218***	0.122***	-0.020***	0.017**	-0.058***	-0.058***	-0.054***	0.003	0.343***	0.172***			
ROA	-0.332***	-0.397***	-0.110***	0.126***	0.015**	0.167***	0.382***	0.836***	-0.107***	0.184***	0.109***	-0.046***		
LOSS	0.254***	0.210***	0.054***	-0.101***	0.007	-0.147***	-0.316***	-0.475***	0.091***	-0.219***	-0.135***	0.026***	-0.559***	
BIG4	-0.159***	-0.143***	-0.087***	0.168***	0.096***	0.141***	0.448***	0.154***	0.098***	-0.017**	-0.012*	-0.034***	0.166***	-0.125***

Notes: We list the pairwise correlation coefficient and statistical significance of the coefficients in this table. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level respectively.

Table 3. Earnings management and company diversification

Panel A. Dependent variable: ABSAWCA

	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.155***	0.151***	0.154***	0.148***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.001***		0.002**	
	(0.000)		(0.029)	
FS		0.012***		0.021***
		(0.000)		(0.000)
IND	-0.011***	-0.011***	-0.012***	-0.017***
	(0.000)	(0.000)	(0.067)	(0.000)
ABHK*IND			0.000	
			(0.692)	
FS*IND				0.012*
				(0.067)
SIZE	-0.010***	-0.010***	-0.010***	-0.010***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.035***	-0.029**	-0.035***	-0.028**
	(0.002)	(0.020)	(0.002)	(0.021)
LEV	0.078***	0.077***	0.078***	0.077***
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.034***	0.029***	0.034***	0.029***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.001*	0.002	0.001	0.002
	(0.090)	(0.206)	(0.491)	(0.209)
DISSUE	0.003*	0.003	0.003*	0.003
	(0.090)	(0.110)	(0.090)	(0.110)
ROA	-0.054***	-0.056***	-0.054***	-0.056***
	(0.000)	(0.000)	(0.000)	(0.000)
LOSS	0.009***	0.009***	0.009***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
BIG4	-0.003**	-0.003*	-0.003**	-0.003*
	(0.025)	(0.054)	(0.025)	(0.052)
Observations	18,893	17,289	18,893	17,289
R-Squared	0.233	0.228	0.233	0.228
F-stat	87.79***	77.31***	85.84***	75.22***
Year, Industry, Country dummies	Yes	Yes	Yes	Yes

Table 3 continued.

Panel B. Dependent variable: ABSABNCFO				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.207***	0.208***	0.199***	0.201***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.002***		0.006***	
	(0.000)		(0.000)	
FS		0.010***		0.029***
		(0.000)		(0.000)
IND	-0.025***	-0.024***	-0.039***	-0.036***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK*IND			0.006***	
			(0.000)	
FS*IND				0.027***
				(0.000)
SIZE	-0.010***	-0.010***	-0.011***	-0.010***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.087***	-0.078***	-0.086***	-0.077***
	(0.000)	(0.000)	(0.000)	(0.000)
LEV	0.010***	0.008**	0.010***	0.008**
	(0.007)	(0.039)	(0.007)	(0.040)
GROWTH	0.064***	0.058***	0.064***	0.058***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.016***	0.016***	0.016***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
DISSUE	0.022***	0.023***	0.022***	0.023***
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.115***	-0.114***	-0.115***	-0.114***
	(0.000)	(0.000)	(0.000)	(0.000)
LOSS	-0.009***	-0.009***	-0.009***	-0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
BIG4	0.007***	0.008***	0.007***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	18,893	17,289	18,893	17,289
R-Squared	0.341	0.331	0.342	0.331
F-stat	139.59***	122.15***	136.36***	118.93***
Year, Industry, Country dummies	Yes	Yes	Yes	Yes

Table 3 continued.

Panel C. Dependent variable: ABSABNPROD				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.245***	0.254***	0.231***	0.245***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	-0.003***		0.003*	
	(0.000)		(0.059)	
FS		-0.017***		0.011
		(0.000)		(0.270)
IND	-0.030***	-0.032***	-0.053***	-0.050***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK*IND			0.010***	
			(0.000)	
FS*IND				0.041***
				(0.003)
SIZE	-0.013***	-0.013***	-0.013***	-0.013***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.016	-0.030	-0.015	-0.029
	(0.364)	(0.123)	(0.414)	(0.134)
LEV	0.057***	0.055***	0.057***	0.055***
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.163***	0.163***	0.163***	0.163***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.009***	0.009***	0.009***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
DISSUE	0.012***	0.012***	0.012***	0.012***
	(0.000)	(0.001)	(0.000)	(0.001)
ROA	-0.046***	-0.031*	-0.045***	-0.031*
	(0.006)	(0.081)	(0.007)	(0.080)
LOSS	-0.007**	-0.007**	-0.007**	-0.006**
	(0.030)	(0.044)	(0.030)	(0.049)
BIG4	0.009***	0.009***	0.009***	0.009***
	(0.001)	(0.003)	(0.001)	(0.003)
Observations	18,893	17,289	18,893	17,289
R-Squared	0.157	0.152	0.158	0.153
F-stat	91.01***	79.47***	88.54***	77.23***
Year, Industry, Country dummies	Yes	Yes	Yes	Yes

Notes:
For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm.

Table 4. Earnings management and company diversification: entities operating in countries with an ADRI above the median of the sample

Panel A. Dependent variable: ABSAWCA				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.160***	0.159***	0.161***	0.157***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.002***		0.002*	
	(0.000)		(0.063)	
FS		0.012***		0.017***
		(0.000)		(0.005)
IND	-0.010***	-0.010***	-0.010*	-0.013***
	(0.001)	(0.001)	(0.052)	(0.008)
ABHK*IND			-0.000	
			(0.948)	
FS*IND				0.007
				(0.428)
SIZE	-0.011***	-0.011***	-0.011***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.042***	-0.042***	-0.042***	-0.042***
	(0.005)	(0.008)	(0.005)	(0.008)
LEV	0.082***	0.084***	0.082***	0.084***
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.034***	0.031***	0.034***	0.031***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	-0.000	0.001	-0.000	0.001
	(0.863)	(0.674)	(0.863)	(0.678)
DISSUE	0.004*	0.003	0.004*	0.003
	(0.078)	(0.223)	(0.078)	(0.222)
ROA	-0.043***	-0.038***	-0.043***	-0.038***
	(0.001)	(0.006)	(0.001)	(0.006)
LOSS	0.009***	0.009***	0.009***	0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
BIG4	-0.004**	-0.005**	-0.004**	-0.005**
	(0.048)	(0.030)	(0.048)	(0.029)
Observations	9,667	8,924	9,667	8,924
R-Squared	0.257	0.251	0.257	0.251
F-stat	63.28***	55.98***	61.64***	54.33***
Year, Industry dummies	Yes	Yes	Yes	Yes

Table 4 Continued.

Panel B. Dependent variable: ABSABNCFO				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.211***	0.215***	0.199***	0.205***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.003***		0.009***	
	(0.000)		(0.000)	
FS		0.011***		0.037***
		(0.001)		(0.000)
IND	-0.034***	-0.031***	-0.053***	-0.047***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK*IND			0.008***	
			(0.000)	
FS*IND				0.035***
				(0.001)
SIZE	-0.013***	-0.012***	-0.013***	-0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.087***	-0.083***	-0.086***	-0.083***
	(0.000)	(0.000)	(0.000)	(0.000)
LEV	0.014***	0.011**	0.014***	0.011**
	(0.006)	(0.034)	(0.007)	(0.035)
GROWTH	0.074***	0.072***	0.074***	0.072***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.016***	0.016***	0.016***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
DISSUE	0.021***	0.021***	0.021***	0.021***
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.124***	-0.122***	-0.123***	-0.122***
	(0.000)	(0.000)	(0.000)	(0.000)
LOSS	-0.016***	-0.016***	-0.016***	-0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
BIG4	0.010***	0.012***	0.010***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)
Observations	9,667	8,924	9,667	8,924
R-Squared	0.347	0.339	0.348	0.340
F-stat	100.61***	89.14***	97.32***	86.32***
Year, Industry dummies	Yes	Yes	Yes	Yes

Table 4 Continued.

Panel C. Dependent variable: ABSABNPROD				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.228***	0.236***	0.211***	0.230***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	-0.004***		0.003	
	(0.000)		(0.276)	
FS		-0.019***		-0.000
		(0.001)		(0.998)
IND	-0.053***	-0.054***	-0.078***	-0.065***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK*IND			0.011***	
			(0.007)	
FS*IND				0.025
				(0.157)
SIZE	-0.016***	-0.016***	-0.016***	-0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.021	-0.020	-0.019	-0.019
	(0.417)	(0.468)	(0.449)	(0.477)
LEV	0.072***	0.067***	0.072***	0.067***
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.159***	0.159***	0.159***	0.159***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.013***	0.013***	0.013***	0.013***
	(0.000)	(0.000)	(0.000)	(0.000)
DISSUE	0.007*	0.007*	0.007*	0.007*
	(0.077)	(0.075)	(0.076)	(0.074)
ROA	-0.043*	-0.041*	-0.042*	-0.041*
	(0.066)	(0.093)	(0.068)	(0.093)
LOSS	-0.006	-0.006	-0.005	-0.006
	(0.224)	(0.179)	(0.237)	(0.190)
BIG4	0.016***	0.015***	0.015***	0.014***
	(0.001)	(0.002)	(0.001)	(0.003)
Observations	9,667	8,924	9,667	8,924
R-Squared	0.171	0.168	0.172	0.168
F-stat	62.03***	55.25***	60.07***	53.78***
Year, Industry dummies	Yes	Yes	Yes	Yes

Notes:
For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm.

Table 5. Earnings management and company diversification: entities operating in countries with an ADRI below the median of the sample

Panel A. Dependent variable: ABSAWCA				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.157***	0.150***	0.154***	0.146***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.001		0.001	
	(0.257)		(0.150)	
FS		0.015***		0.025***
		(0.000)		(0.000)
IND	-0.008**	-0.010***	-0.012**	-0.017***
	(0.012)	(0.004)	(0.033)	(0.005)
ABHK*IND			-0.012	
			(0.336)	
FS*IND				0.016
				(0.126)
SIZE	-0.009***	-0.009***	-0.009***	-0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.021	-0.004	-0.021	-0.003
	(0.263)	(0.851)	(0.272)	(0.868)
LEV	0.069***	0.064***	0.069***	0.064***
	(0.000)	(0.000)	(0.000)	(0.000)
GROWTH	0.034***	0.026***	0.034***	0.026***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.003	0.004	0.003	0.004
	(0.202)	(0.106)	(0.207)	(0.108)
DISSUE	0.001	0.004	0.001	0.004
	(0.780)	(0.274)	(0.781)	(0.283)
ROA	-0.077***	-0.094***	-0.077***	-0.094***
	(0.000)	(0.000)	(0.000)	(0.000)
LOSS	0.010***	0.008***	0.010***	0.008***
	(0.000)	(0.002)	(0.000)	(0.002)
BIG4	-0.001	-0.000	-0.001	-0.000
	(0.414)	(0.929)	(0.428)	(0.952)
Observations	9,226	8,365	9,226	8,365
R-Squared	0.186	0.181	0.186	0.181
F-stat	36.11***	31.48***	35.13***	30.52***
Year, Industry dummies	Yes	Yes	Yes	Yes

Table 5 Continued

Panel B. Dependent variable: ABSABNCFO				
	(1)	**(2)**	**(3)**	**(4)**
Intercept	0.206***	0.204***	0.199***	0.199***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	0.001		0.004***	
	(0.253)		(0.000)	
FS		0.009***		0.021***
		(0.005)		(0.003)
IND	-0.015***	-0.014***	-0.028***	-0.023***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK*IND			0.005***	
			(0.001)	
FS*IND				0.020*
				(0.091)
SIZE	-0.009***	-0.009***	-0.009***	-0.009***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	-0.079***	-0.058**	-0.078***	-0.058**
	(0.000)	(0.017)	(0.000)	(0.018)
LEV	-0.001	-0.003	-0.001	-0.003
	(0.783)	(0.563)	(0.812)	(0.576)
GROWTH	0.047***	0.033***	0.047***	0.033***
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.016***	0.016***	0.016***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)
DISSUE	0.026***	0.030***	0.026***	0.030***
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.090***	-0.085***	-0.089***	-0.085***
	(0.000)	(0.000)	(0.000)	(0.000)
LOSS	-0.000	0.000	-0.000	0.000
	(0.929)	(0.948)	(0.909)	(0.936)
BIG4	0.004**	0.005***	0.005**	0.005***
	(0.013)	(0.007)	(0.011)	(0.005)
Observations	9,226	8,365	9,226	8,365
R-Squared	0.285	0.264	0.286	0.265
F-stat	54.13***	45.20***	52.97***	43.97***
Year, Industry dummies	Yes	Yes	Yes	Yes

Table 5 Continued.

Panel C. Dependent variable: ABSABNPROD

	(1)	(2)	(3)	(4)
Intercept	0.268***	0.271***	0.266***	0.265***
	(0.000)	(0.000)	(0.000)	(0.000)
ABHK	-0.001		0.000	
	(0.317)		(0.868)	
FS		-0.003		0.014
		(0.566)		(0.341)
IND	-0.008	-0.012*	-0.013	-0.024**
	(0.240)	(0.081)	(0.217)	(0.038)
ABHK*IND			0.002	
			(0.498)	
FS*IND				0.028
				(0.198)
SIZE	-0.010***	-0.011***	-0.010***	-0.011***
	(0.000)	(0.000)	(0.000)	(0.000)
CFO	0.027	0.009	0.028	0.010
	(0.276)	(0.746)	(0.267)	(0.726)
LEV	0.016**	0.016*	0.016**	0.016*
	(0.033)	(0.057)	(0.032)	(0.054)
GROWTH	0.160***	0.160***	0.160***	0.161**
	(0.000)	(0.000)	(0.000)	(0.000)
EISSUE	0.004	0.004	0.004	0.004
	(0.298)	(0.335)	(0.304)	(0.341)
DISSUE	0.031***	0.030***	0.030***	0.030***
	(0.000)	(0.000)	(0.000)	(0.000)
ROA	-0.069***	-0.041*	-0.068***	-0.040
	(0.005)	(0.099)	(0.005)	(0.104)
LOSS	-0.003	-0.001	-0.003	-0.001
	(0.507)	(0.781)	(0.503)	(0.790)
BIG4	0.007**	0.007*	0.007**	0.007*
	(0.047)	(0.061)	(0.045)	(0.058)
Observations	9,226	8,365	9,226	8,365
R-Squared	0.127	0.127	0.127	0.127
F-stat	40.40***	36.60***	39.12***	35.49***
Year, Industry dummies	Yes	Yes	Yes	Yes

Notes:

For clarity, year-specific and industry-specific intercepts are omitted. *, **, *** indicate that a coefficient is statistically significant at the 10%, 5%, and 1% level or better. P-values calculated from standard errors clustered by firm. Refer to Appendix A for variable description.