Mandatory IFRS Adoption and Earnings Quality: The Impact of Country-Specific Factors

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Abstract

We investigate how country-specific factors impact earnings quality in 23 countries where the use of International Financial Reporting Standards (IFRS) has been made mandatory. Our sample consists of 16,238 observations across 8 industries for the period 2007-2011. Using both accruals and real earnings management as a proxy for earnings quality and World Economic Forum (WEF) scores to capture time-relevant country-specific factors, we first observe that firms engage in both accruals and real earnings management. Second, for the same firms we find that accruals earnings management is significantly negatively related to strong investor protection, strong enforcement of accounting standards and capital market strength while real earnings management is significantly positively related to the same factors. Our findings suggest two things: first, that IFRS implementation alone is insufficient in improving earnings quality in the absence of strong institutions. Second, when faced with strong investor protection and regulation, firms prefer real earnings management which is more difficult to detect compared to accruals earnings management. The results are consistent with findings in the accruals vs real earnings management literature (Zang, 2012; Cohen and Zarowin, 2010) and the IFRS earnings quality literature (Soderstrom and Sun, 2007; Callao and Jarne, 2010; Hoque et al (2012).

Keywords: earnings quality; IFRS, accruals earnings management; real earnings management; institutional factors.

INTRODUCTION

In the relentless march of global IFRS implementation, country-specific factors have been relatively side-lined in the surrounding discussions of the benefits of having more and more countries applying International Financial Reporting Standards (IFRS). Walker (2010) warns of the dangers of this, arguing that uniform accounting standards would damage the richness of different varieties of capitalism. He goes on to argue that instead of continuously looking at improving international accounting standards (implying that current standards are not up to par), more attention needs to be paid towards a country's political and economic system.

Ball (2006) among other things argues that a key benefit of IFRS to investors is better quality accounting:

> "IFRS promise more accurate, comprehensive and timely financial statement information, relative to the national standards they replace for public financial reporting in most of the countries adopting them, Continental Europe included" (pg.11).

IFRS standards are also argued to result in better capital allocation, greater market liquidity and a lower cost of capital (Ball, 2006: Tweedie, 2006). To date more than 134 countries either require or permit IFRS for local listed companies (Houque at al., 2012), with varied timings and extent of commitment to IFRS between 2001–2010.

Existing academic research have begun to unpack the benefits of IFRS implementation. Studies by Gassen and Sellhorn (2006), Barth et al., (2008), and Hung and Subramanyam, (2007) all report improved earnings quality following voluntary adoption of IFRS standards. However, there is still concern that predicted improvements in the quality of financial reporting after IFRS adoption may not be borne out (Street et al., 2000; Street and Bryant, 1999). IFRS standards allow for room to exercise judgement and use of private information, and as result, grant managers a substantial discretion.

Prior accounting studies suggest that discretion is a double-edged sword (e.g., Watts and Zimmerman, 1986). On one hand, discretion induces a less costly application of reporting regulation.

Furthermore, it permits corporate insiders to adapt financial reports so that they better reflect the underlying economic reality and to convey private information residing within the firm. On the other, this discretion can potentially be used opportunistically. For example, corporate managers could use reporting discretion to secure certain earnings targets, obfuscate economic performance, or avoid covenant violations (Leuz, 2010). Given that insiders have an information advantage over the outsiders; it is difficult to restrain such behaviour. The extent to which this discretion is used hinges upon national legal institutions (Ball et al., 2003), and firm specific characteristics (operating characteristics and reporting incentives) (Burgstahler et al., 2006; Christensen et al, 2008). That is, accounting standards interact with many contextual factors such as social norms, law, and commercial codes in different contexts in many ways (Fearnley and Sunder, 2012).

Existing work looking at voluntary IFRS adoption cannot be automatically extrapolated to situations where IFRS adoption has been made mandatory. When firms are forced to use IFRS, there are different compliance incentives and therefore, the flexibility embedded in IFRS opens the door for opportunistic manipulation of financial reporting (Soderstrom and Sun, 2007). How institutional factors impact financial reporting quality after mandatory IFRS adoption remains an interesting and open question.

In this study, we build upon existing literature that employ earnings management as a measure of earnings quality and examine how country-specific factors impact earnings quality in a sample of firms in countries where IFRS has been made mandatory. Specifically, we look at how investor protection, enforcement of accounting standards and the strength of capital market affect earnings quality in 23 countries between 2007 and 2011. We further refine prior work in the following ways: first, we extend earnings management to include both accruals and real earnings management. Zang (2012) found that firms simultaneously use accruals and real earnings management, and therefore any analysis that does not consider both types of earnings management may be incomplete. Second, we further refine our sample based on Daske et al's (2007) critique of incomplete classification of countries applying IFRS standards. Third, we move away from using La Porta et al's (1998) index of investor protection, which may no longer capture institutional factors in the post-financial crisis world

(Kaufmann et al, 2007), and use factors as identified by the World Economic Forum (WEF) corresponding specifically to the years in which the study is performed. Fourth, we cover a period of post-mandatory IFRS implementation not yet studied in the literature. In contrast, previous studies focused on single country or across countries using one or two years and a few of them 3 years. Finally, we use a more mixed sample of countries representing not only Europe, but also Asia, the Middle East and Africa. We believe this adds more variety to the country-specific factors and would add richness to the analysis of the impact of IFRS in different institutional settings.

We find that earnings management varies according to both the institutional environments of countries in the sample and also the type of earnings management employed (accruals or real). Holding application of IFRS as a constant, countries with strong investor protection, strong enforcement of accounting standards and large capital markets show less accruals earnings management and more real earnings management, and vice versa. This suggests that IFRS implementation alone is insufficient to ensure improved earnings quality if country-specific factors are not adjusted for. This is important because countries which implement IFRS in a manner that decouples it with strong investor protection and good enforcement will not be able to reap its benefits. It also shows that the use of IFRS is not a short-cut to improve corporate governance and financial reporting if certain institutional factors are ignored. Policy makers and accounting standard setters may find it useful to also focus on the harmonisation of institutional factors for better outcomes of IFRS adoption.

The remainder of the paper proceeds as follows. The next section outlines the literature review, followed by research design and sample selection. We then present the descriptive statistics, analysis and discuss our findings. The final section concludes.

LITERATURE REVIEW

In discussing the advantages of IFRS implementation globally, Ball (2006) argues that one key advantage is higher quality of information, which will in turn lead to more informed decision making on the part of investors. Work by Barth et al (2008), Cai et al (2008), Gassen and Sellhorn (2006), and Hung and Subramanyam (2007) found evidence that supports this among voluntary IFRS

adopters worldwide, but findings from Jeanjean and Stolowy (2008), Van Tendeloo and Vanstraelen (2005) and Goncharov (2005) find that the use of IFRS has no impact on quality, in particular levels of earnings management.

The mixed findings can be partly explained by the influence of country-specific factors: the adoption of a common set of accounting standards across the globe may not improve quality of financial reporting homogeneously in each company and country because of the other factors' effect such as financial reporting incentives, legal systems and political systems that may affect accounting quality (Soderstrom and Sun, 2007). While high quality accounting standards is necessary to achieve an economically efficient financial reporting system, (Ball, 2001), country-specific factors such as the presence of an independent legal system, a strong accounting profession, the separation of financial reporting for public interests and taxation, and corporate ownership and governance structures all play role in creating an efficient public accounting disclosure environment (Ball, 2001).

The work of La Porta et al (2000) popularised the notion of how country-specific factors impacted the quality of corporate governance: in particular, the strength of investor protection – which is rooted in a country's legal origin and structure – explained variations in corporate governance practices. Since financial reporting is a corporate governance mechanism, differences in investor protection may cause different accounting practices across countries even though when applying the same accounting standards. Work by Leuz et al (2003), which specifically looked at how levels of earnings management varied in different countries, found lower levels of earnings management in countries with stronger investor protection. Countries with similar legal backgrounds or shared history can also exhibit similar accounting practices, as Nobes (2011) found. Initially classifying accounting practices across fourteen countries into two groups in 1983, Nobes found that the same groupings persist in the post-IFRS era, suggesting that country-specific factors influence accounting practices in ways which international accounting harmonisation may find difficult to overcome: in essence, *de jure* accounting harmonisation may not necessarily lead to *de facto* accounting harmonisation. We return to these country specific factors later in this section.

Accruals-Based vs. Real Earnings Management

Earnings management has been a popular measure of accounting quality in the literature, and in this paper we continue this tradition. The mainstay of the earnings management literature over the past twenty years has been that of accruals-based earnings management, where managers manipulate accruals in a bid to present financial results in a positive light. While popular, accruals-based earnings management has been controversial due to issues related to econometric modelling of accruals manipulation (Stubben, 2010).

Less prevalent in the literature until recently are real earnings management, defined as managerial actions inconsistent with normal business practices, undertaken with a view to manipulate earnings (Roychowdhury, 2006). Zang (2012) lists examples of real earnings management as managerial discretion over R&D, stock repurchases, sale of profitable assets, sales price reductions, derivative hedging, debt-equity swaps and securitization. Evidence from Graham et al (2005) who surveyed over 400 CFOs suggests that managers prefer real earnings management to that of accruals manipulation, as real earnings management tend to be more difficult to detect. This is supported by empirical findings of Cohen et al (2008) who found that real earnings management became more popular post-Sarbanes Oxley which saw tightening regulation and more scrutinization of accruals and accounting numbers.

Further evidence from Cohen and Zarowin (2010) suggests that firms were more likely to partake in real earnings management surrounding seasonal equity offerings, and Zang (2012) observed that firms tended to engage in both accrual and real earnings management, but often only resort to accrual earnings management if strategies taken via real action do not achieve the desired result.

We now focus our attention on literature in earnings management surrounding IFRS adoption.

Earnings Management, IFRS and Country Specific Factors

The early earnings management literature surrounding IFRS adoption focused on firms that voluntarily adopted IFRS. An example of this body of work is that of Leuz et al (2003), who found that for a sample of 31 countries, earnings management is lower in countries with stronger investor protection. Similarly, Reverte (2008) find that investor protection is significantly negatively associated with earnings management across 11 European countries. Cai et al., (2008) meanwhile found that for 32 countries between 2000 and 2006, earnings management is lower after voluntary and mandatory IFRS adoption. The enforcement of IFRS is also found to be playing a significant role in reducing earnings management. However, the results of the effect of voluntary IFRS adoption on earnings quality cannot be automatically applied to cases of mandatory IFRS adoption. Soderstom and Sun (2007) argued that in the case of voluntary adoption, firms have incentives to adopt the standards to enhance the quality of their financial reporting, whereas firms obliged to adopt IFRS might not comply with these standards especially in the countries with low investor protection, low enforcement of accounting standards, less dispersed ownership, and smaller stock markets.

Capkun et al (2012) extends this by arguing that international accounting standards changed significantly from the early voluntary adoption era to the compulsory adoption year in Europe in 2005. That is, revised IASs and new IFRSs allow more flexibility in choosing alternative accounting methods in comparison with the earlier IAS. They posited that this flexibility induced greater earnings management under current IFRS. Consistent with their hypothesis, they found that earnings management increased post-2005 compared to pre-2005 for early adopters, late voluntary adopters and mandatory adopters in the countries where IFRS were not permitted before.

Callao and Jarne (2010) examined this further and included investor protection and legal systems as possible determinants of earnings quality. They observe a negative relationship between earnings management level and investor protection and legal system across 11 EU countries. More recently, Houqe et al., (2012) investigated the effect of compulsory IFRS application and investor protection on quality of financial reporting across forty six countries. They found that both the adoption of IFRS and the strong investor protection were necessary to enhance earnings quality.

A common theme among these studies is that they are focused on accruals-based earnings management. As discussed above, accruals-based earnings management is only part of the earnings

manipulation strategy that firms engage in – and that there is a preference for managers to opt for real earnings management (Graham et al, 2005). Therefore any study that does not simultaneously consider real earnings management together with accruals earnings management may be painting a misleading picture of the impact of IFRS on earnings management and earnings quality.

Also, as identified by Leuz et al (2003), Reverte (2008), Cai et al (2008), Callao and Jarne (2010) and Houqe et al (2012), IFRS adoption along may not adequately explain variations in earnings management levels. While accounting can be considered as an institution that can help reduce information asymmetry and information costs, and lower transaction costs (Wysocki, 2011), other country-specific factors such as legal systems, enforcement of laws, investor protection and corporate governance mechanisms are important determinants of the quality of financial reporting. These factors interrelate and complement each other (Leuz et al, 2003; Ball (2001).

From the literature, we identify the following country specific factors to have an impact on earnings quality: the level of judicial independence, overall investor protection afforded by the law, legal origins, strength of capital markets and ownership concentration. These factors do not operate in isolation, and often influence each other.

Judicial independence measures the "efficiency and integrity of the legal environment as it affects business" (Laporta et al., 1998:1124). History and theory suggest an association between judicial independence and common law system, both predicting the same economic freedoms. When the government becomes a litigant, for instance when the state takes property, judicial independence is of apparent importance to secure property rights (La Porta et al., 2004). Thus, we posit that efficient judicial independence enhances shareholder protection.

Prior to IFRS implementation, common law countries applied standards designed to satisfy investor information needs, while code law countries implemented accounting standards that were more attuned to governmental needs. With IFRS, these differences in accounting standards are eliminated, but the legal environment may still influence the implementation and the enforcement of IFRSs, as the IASB does not have the power to enforce IFRSs and monitor compliance. Ball et al (2000) found that code-law countries applying Anglo-American accounting standards lack

enforcement, which in turn affects quality of disclosure. Gassen et al. (2006) provide evidence that income smoothing is less prevalent in common-law countries, and Armstrong et al. (2010) report a negative market reaction to IFRS adoption in countries with weak enforcement of accounting standards. Byard et al (2010) meanwhile conclude that mandatory IFRS application enhances analysts' forecast accuracy for firms domiciled in countries with strong accounting standards enforcement. These findings suggest that the code law vs common law dichotomy still exists.

Earlier work has also shown that code law countries tend to have insider-finance systems, while common law countries tend to have outsider-finance systems – it follows, therefore, that common-law countries have stronger investor protection laws (La Porta et al., 1997 and 1998; Leuz et al., 2003).The presence of outside directors have also been found to add another layer of investor protection , and research suggests that earnings management is lower in companies with a high number of independent directors on the board (Dechow et al., 1996; Klein, 2002; Peasnell et al., 2005: Ebrahim, 2007). In addition to legal enforcement and investor protection, ownership concentration has been found to be an important determinant of accounting information quality (Fan and Wong, 2002; Leuz et al., 2003; *Reverte, 2008)*. Under concentrated ownership, the controlling shareholders may expropriate the minority shareholders as a result of the conflicts of interest between both groups of shareholders (Shleifer and Vishny, 1997; LaPorta et al., 1999; Johnson et al., 2000), thus, earnings could be managed to maximize the utility of controlling shareholders. While Leuz et al., (2003) and Burgstahler et al. (2006) conclude no association between accounting information quality and ownership concentration, Reverte (2008) reports a lower earnings management in countries with lower ownership concentration. Leuz et al., (2003) argue that large equity markets complement investor protection and thereby they observe less earnings management.

In this paper, we investigate how these country-specific factors affect earnings management in countries where IFRS is mandatory, extending existing literature to also examine how these factors impact real earnings management. That is, holding use of IFRS standards constant, we ask: what factors influence accruals-based and real earnings management? We hypothesise that firms engage in both accruals-based and real earnings management (H1) and that accruals-based (real) earnings

management is lower (higher) in countries with strict investor protection, strong enforcement of accounting standards and large stock markets (H2).

Earlier comparative studies cited above employ Laporta et al. (1998)'s measures of corporate governance to test the effect of country-specific factors on earnings quality across countries (e.g. Leuz et al., 2003; Reverte, 2008; Callao and Jarne, 2010; Andre and Filip, 2012; Cai et al., 2008)[1]. However, Kaufmann et al. (2007) argue that substantial changes in governance structure have occurred during the period from 1996 through 2007, and therefore La Porta et al (1998)'s observations on country-specific factors may no longer hold.[2] In this study, we expand upon these indicators use recent indicators of World Economic Forum and the World Bank (see Table 1). These variables are: judicial independence, board independence, protection of minority shareholder rights, enforcement of securities laws, enforcement of accounting and auditing standards, and the importance of capital market.

RESEARCH DESIGN

Accruals based earnings management

The most popular accruals models used in the literature include Healy (1985), Jones (1991), Modified Jones, Dechow and Dichev (2002) and McNichols (2002). We use the Dechow and Dichev (2002) model as augmented by Francis et al (2005). Dechow and Dichev (2002)'s approach requires regressing the change in short term working capital accrual (AWC) on past, current and future cash flows from operation (CFO). The logic behind this perspective is that accruals anticipate cash outflows or inflows and reverse when cash, which is recognized in accruals before, is paid or received. In this model, the proxy of earnings quality is the standard deviation of residuals from the

[1] Legal origin, common law or code law used in prior studies is based on Laporta et al., (1998). Outside investor rights variable is the index of anti-director rights created by Laporta et al., (1998). Legal enforcement is the mean rank across three variables used in Laporta et al., (1998); (1) the efficiency of the judicial system, (2) the corruption index, and (3) an assessment of rule of law. Also, The Importance of Equity Market is the mean score of three variables in Laporta et al., (1997); (1) the number of listed domestic firms relative to the population, (2) the ratio of the aggregate stock market capitalization held by minorities to gross national product, and (3) the number of IPOs relative to the population.

[2] See Siems (2008), Aguilera and Williams (2009) and Spamann (2010) for a critique of the La Porta Anti-Director Index

regression. Francis et al., (2005) augmented the DD (Dechow and Dichev) model with the fundamental variables from the Jones model, precisely, change in sales revenues and PPE.

Following Francis et al., (2005), this study modifies the DD model by adapting it with the fundamentals variables from the modified Jones model, including deducting the change in receivables from the change in revenues. We run the following regression for each combination of 2-digits GICS and year in each country:

$$\boldsymbol{ACC_t = a_0 + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4(\Delta REV_t - \Delta REC_t) + \beta_5 PPE_t + \varepsilon} \quad (1)$$

The metric of earnings quality is the residuals from previous estimation. The residuals represent the accruals that are not resulted from cash flow, revenues and PPE. To put it differently, the residuals are the abnormal accruals.

Where:

$\boldsymbol{ACC_t}$ [3] = accruals in year t;

$\boldsymbol{CFO_{t-1}}$ = cash flow from operating in year t-1;

$\boldsymbol{CFO_t}$ = cash flow from operating in year t;

$\boldsymbol{CFO_{t+1}}$ = cash flow from operating in year t+1;

$\Delta\boldsymbol{REV_t}$= change in sales in year t;

$\Delta\boldsymbol{REC_t}$= change in receivables from clients in year t;

$\boldsymbol{PPE_t}$= Gross value of property, plant and equipment in year t.

Prior comparative studies on earnings management and voluntary adoption of IFRS did not employ the residuals models since the low number of companies in each industry. Most country level studies used the residuals as a metric when the number of observations is enough. They also followed the SICs codes when calculating the discretionary accruals.

[3] In this study, accruals are measured following the cash flow approach since Hribar and Collins, (2002) report empirical evidence that accruals is potentially mismeasured when using balance sheet approach.

Houqe et al., (2012) employed the 2-digits GICS to control the effect of industry in the regression when they investigated the effect of investor protection and IFRS adoption on earnings quality across the world. In addition, Bhojraj et al., (2003) recommends using the Global Industry Classifications Standard (GICS) when identifying the abnormal earnings activities. That is, GICs codes result in more powerful tests than SICs codes do. Chan et al.,(2007) report that grouping based on 4-digits GICS is almost the same as that based on Fama and French (1997). It is also noted that the difference between the results if 2-digits GICS is followed rather than the 4-digits is meagre especially if financials are excluded. General factors that affect most of firms in broadly classified industries might be more important than the specific factors that account for homogeneity (Chan et al., 2007).

The average number of observations used in the literature is 8 to 10 observations per industry in a year when running the regrssion. Subramanyam (1996) excluded the industries less than six observation every calendar year. Since the number of observations is low in some countries, we follow broad industry classification 2 digits GICS which allows us to use this model. In this study, the minimum number of firms in each industry is at least six; however, most of the industry group are much more than six observations per calendar year

Signed and unsigned accruals

The literature reveals using two methods to measure the level of accruals-based earnings management. The first uses signed accruals to capture the direction of earnings management (e.g., DeFond and Subramanyam, 1998; Francis and Wang, 2008; Houqe et al., 2012). The second uses unsigned accruals estimates or the variance of these estimates to explore the tendency of firms to manage earnings rather than the behaviour of earnings management (e.g., Dechow and Dichev, 2002; Frankel et al., 2002; Klein, 2002; Chung and Kallapur, 2003; Leuz, et al., 2003; Bergstresser and Philippon, 2006). These studies test for earnings management in the absence of a particular sign. Hribar and Nichols (2007) argue that the use of these methods leads to different results as a consequence of the change in the probability distribution when using the absolute discretionary

accruals. Furthermore, the effect of correlated omitted variables is greater in absolute discretionary accruals than in signed discretionary accruals.

This study employs signed abnormal accruals since it is more accurate than the absolute discretionary accruals, and the overestimation of earnings is the concern. Leopold et al., (1979) argue that earnings determined conservatively are, for the most part, of higher quality than those liberally determined. Financial statements which reflect bad news are more transparent than those that reflect good news (Ball et al., 2000).

Real earnings management

Following Roychowdhury (2006), and Cohen and Zarowin (2010), this study employs three metrics to examine the level of real actions to manage earnings, namely, the abnormal levels of cash flow from operations (CFO), production costs and discretionary expenses.

1. Manipulating the sales by generating additional unsustainable sales revenue or accelerating the timing of sales via increased periodic price reductions or through more compassionate credit terms. By doing so, the sales volume increases temporarily in the current year, however, such increased sales disappear once the managers revert to the old prices. However, the more credit sales and discounts will results in lower cash flow.
2. Increasing production levels to lower the cost of sold goods (COGS). In an attempt to reduce fixed costs per unit, managers would produce more units spreading the fixed costs on a larger number of units. Simultaneously, the marginal cost per unit does not change, thus the total cost per unit declines. As a result, the cost of sold goods declines and the reported operating margins increase. Nonetheless, the firm will still incur the costs of over produced units that probably are not to be sold in the current period leading to lower cash flow from operation. .
3. Reducing discretionary expenditures such as advertising, R&D, and maintenance. Such decreases in discretionary expenditures will create greater earnings and cash flow in the current period.

Estimation models:

Abnormal cash flow from operation (CFO)

$$\frac{\boldsymbol{CFOt}}{\boldsymbol{A_{t-1}}} = \boldsymbol{a_0} + \frac{\boldsymbol{a_1}}{\boldsymbol{A_{t-1}}} + \boldsymbol{\beta 1}\ \frac{\mathbf{SALES\ t}}{\mathbf{A_{t-1}}} + \boldsymbol{\beta 2}\ \frac{\boldsymbol{\Delta}\mathbf{SALES\ t}}{\mathbf{A_{t-1}}} + \boldsymbol{\varepsilon it} \qquad (\mathbf{2})$$

Abnormal *CFO* is actual *CFO* minus the normal level of *CFO* calculated using the estimated coefficients. In other words, the residuals from the regression (2) represent the abnormal CFO.

$\boldsymbol{A_{t-1}}$= lagged total assets in year t–1.

Abnormal production costs (PROD)

$$\frac{\boldsymbol{PROD_t}}{\boldsymbol{A_{t-1}}} = \boldsymbol{a_0} + \frac{\boldsymbol{a_1}}{\boldsymbol{A_{t-1}}} + \boldsymbol{\beta_1}\frac{\mathbf{SALES_t}}{\mathbf{A_{t-1}}} + \boldsymbol{\beta_2}\frac{\boldsymbol{\Delta}\mathbf{SALES_t}}{\mathbf{A_{t-1}}} + \boldsymbol{\beta_3}\ \frac{\boldsymbol{\Delta}\mathbf{SALES_{t-1}}}{\mathbf{A_{t-1}}} + \boldsymbol{\varepsilon it} \qquad (\mathbf{3})$$

Abnormal *PROD* is the actual *PROD* minus the normal level of *PROD* calculated using the estimated coefficient. More specifically, the residuals from the regression (3) represent the abnormal PROD. Production costs (PROD) are defined as the sum of change in inventory and COGS during the period.

Abnormal discretionary expenditures (DISX)

$$\frac{\boldsymbol{DISX_t}}{\boldsymbol{A_{t-1}}} = \boldsymbol{a_0} + \frac{\boldsymbol{a_1}}{\boldsymbol{A_{t-1}}} + \boldsymbol{\beta}\ \frac{\mathbf{SALES_{t-1}}}{\mathbf{A_{t-1}}} + \boldsymbol{\varepsilon it} \qquad (\mathbf{4})$$

Abnormal *DISX* is the actual *DISX* minus the normal level of *DISX* calculated using the estimated coefficient. DISX discretionary expenses are the difference between operation income and gross income from Worldscope (SG&A expenses, R&D expenses and advertising expenses are included). We run these regressions for each combination of 2-digits GICS and year in each country.

Following Cohen and Zarowin (2010), REM1 is our first measure of real earnings management computed by adding the abnormal production costs to the abnormal discretionary expenses after multiplying it by negative one. We multiple the abnormal discretionary expenses by negative one because the more cutting in these expenses, the higher earnings). Therefore, the higher this amount, the firms are more likely to manage earnings. REM2 is the second measure of real earnings management, which is the aggregation of both abnormal cash flow and abnormal discretionary expenses after multiplying both of them by negative one. We also multiple the abnormal cash flow because the lower cash flow, the greater manipulation of sales. Thus the higher REM2, the greater real earnings management is.

Main Model

To measure the effect of institutions on earnings management, we run the following regression[4]:

$$\boldsymbol{EM_{it} = \beta_0 + \beta_1 INS + \beta_2 ROA_{it} + \beta_3 Size_{it} + \beta_4 Lev_{it} + \beta_5 Growth_{it} + \beta_6 Shares_{it} + \varepsilon}$$

EM[5] is earnings management metric (DAACR, REM1, REM2)

INS= institutional variable

JUD= Judicial Independence (WEF, 2008-2011)

BIND = Board Independence (WEF, 2008-2011)

SEC is the enforcement of securities laws (WEF, 2008-2011)

MIN= protection of minority shareholders (WEF, 2008-2011)

ACC= enforcement of auditing and accounting standards (WEF, 2008-2011)

[4] We run pooled OLS clustered by firm and year to correct for heteroscadisity, autocorrelation and cross sectional dependence. Petersen (2008) argue that the residuals might be correlated across time or across firms in the panel data which induces to a biased OLS standard error. Clustering by two dimensions (firm and year) produces unbiased standard errors in the presence of serial autocorrelation and cross sectional dependence.

[5] DAACR is the residuals from the accruals model. RM1 and RM2 are the metrics of real earnings management.

Market size= Market capitalization (also known as market value) is the share price times the number of shares outstanding , as a percentage of GDP (The World Bank, 2007-2010)

ROA = net income divided by total assets

Size = natural logarithm of total assets for firm i in year t

Lev = end of year total liabilities divided by end of year equity book Value for firm i in year t

Growth = sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1

Shares = natural logarithm of outstanding shares for firm i in year t.

Table 1 provides detailed description of all regression variables. Since the correlations among the six institutional variables are relatively high and each of them mentions to the strength of investor protection, a Principle Component Analysis was performed to obtain one metric of investor protection from these six variables (see Appendix 1). We found that all variables loaded onto one factor, which is consistent with the nature of the interrelatedness and complementary nature of the country-specific factors.

[Insert Table 1 here]

We also run the regression twice more to test the effect of the enforcement of auditing and accounting standards and the strength of capital market.

We control for the following variables:

firm size - smaller firms have more incentives to manage earnings to avoid reporting losses than larger firms. That is, internal control systems are more efficient in large firms than in small firms which are more willing to engage in earnings management (Ge and McVay, 2005; Doyle et al., 2007). We use the natural log of total assets to capture firm size.

capital structure - There is substantial evidence that firms with binding debt covenants are more likely to boost earnings than firms without such closeness to debt covenants (Watts and Zimmerman, 1986; DeAngelo and Gilson 1994; DeFond and Jiambalvo, 1994; Sweeney 1994; Francis and Wang, 2008). We use the variable LEV (leverage) to control for this.

growth - growth is a potential reason to window-dress the financial statements by increasing the earnings to attract more investors. Prior research suggests that the incentive to boost earnings increases with firms' growth opportunities (e.g. Barth et al. 1999 and Skinner and Sloan, 2002). However, Richardson et al., (2005) show that growth is negatively associated with earnings management. Therefore, we make no directional prediction about Growth.

number of shares - Following Barton and Simko (2002), Cohin and Zarowin (2010) and Zang (2012), we include shares to control for capital market incentives. Since greater number of shares outstanding decreases the earnings per share, income increasing activity increases to beat earnings estimate (Zang, 2012). In contrast, when it would be more difficult to meet or beat the expectations, managers do not engage in earnings management (Barton and Simko, 2002).

profitability - Doyle et al., (2007) report material weakness in internal controls in less profitable firms. We include ROA return on assets.

Sample selection

A total of 16,328 firm-years were used, spanning eight industries excluding financial institutions and utilities, between 2007 and 2011. Table 2 outlines the sample selection process.

[Insert Table 2 here]

Given that most previous studies on earnings quality after mandatory IFRS adoption were conducted across Europe, this study tries to go farther by including countries outside Europe. The countries' sample is Australia, Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Greece, Hong Kong, Italy, Jordan, Netherlands, Norway, Oman, Philippines, Poland, Portugal,

Singapore, South Africa, Spain, Sweden, the UK[6]. These countries were chosen on the basis that they have a minimum number of listed companies for the regression to be effective, and that they have adopted IFRS standards prior to 2006.

These countries are different in geographical location, legal system origin and enforcement, investor protection, the extent of wealth, and culture. This mixture of countries will allow us to shed light on the effect of country-specific factors on earnings quality where IFRS application is mandatory.

Most of these countries enforced IFRS adoption in 2005 or earlier. In 2002 European Union mandated companies listed on exchanges in the EU to use IFRS in preparing their financial statements starting from 1 January 2005 (IAS Regulation 2002). In accordance with this requirement, publicly traded companies should prepare their financial reporting in conformity with IFRS. However, the regulation permitted Member States to delay the compliance with IFRS until 2007 for publicly traded companies whose securities are only debt securities, and for companies listed in both EU and on other regulated market outside the EU which are applying different accounting GAAP. Therefore, the year 2007 was the year when all companies listed on regulated markets in the EU prepared their financial statements in accordance with IFRS.

Worldscope database provides a variable called "WS.AcctgStandardsFollowed" which shows whether the company applying IFRS. If the output is 23, it means that the company applies IFRS. However, there were shortcomings and a classification error in the field as reported by Daske et al., (2007). Moreover, Thomson One classifies a company as IFRS adopter if the companies mention that in its annual report. In some countries such as Hong Kong, Singapore and Philippines, the local accounting standards applied are identical to IFRS but under different name. In such countries companies apply the national standards are considered as non-adopters by Worldscope, therefore, companies in these countries are considered as IFRS adopters if "WS.AcctgStandardsFollowed" gives

[6] See Appendix1 for more information of the data of IFRS adoption and the version used.

01(local standards) or 23 (IFRS). Table 3 summarises the countries, industries and number of firms in the sample.

[Insert Table 3 here]

Descriptive statistics

Table 4 presents median values of country-level regression variables. Accruals based earnings management are highest in Australia and lowest in Denmark, real earnings management through abnormal production costs is highest in Australia and lowest in Oman, and real earnings management through cash flow and discretionary expenditures is highest in the UK and lowest in Bulgaria. Hong Kong and South Africa have the strongest equity market, measured by market size relative to GDP with data from the World Bank. Italy and Bulgaria have the weakest. For various country-specific factors, data was obtained from the World Economic Forum. We observe that judicial independence is highest in the Scandinavian region, namely Sweden, Denmark and Finland, while Bulgaria has the lowest level of judicial independence. Board independence is highest in Sweden and lowest in Italy. Enforcement of securities law are strongest in South Africa and Sweden, and weakest in Spain and Bulgaria; for accounting and auditing standards, enforcement is again strongest in South Africa and Sweden and weakest in Italy and Bulgaria. Here we observe a casual link between the strength of the enforcement of securities laws and that of accounting and auditing standards. Last but not least, minority investor protection is strongest in Sweden and Finland, and lowest in Italy and Bulgaria. Overall there seems to be recurring countries that are ranked highest and lowest in these country-specific factors, again suggesting that these factors are often interrelated and complementary.

[Insert Table 4 here]

Firm level descriptive statics are presented in Table 5. The mean for accruals earnings management (ADDCR), abnormal production costs (A_PROD), abnormal discretionary costs (A_DISX) and abnormal cash flow (A_CFO) is approaching zero as they are measured as residuals of regression equations. The medians are 0.001, 0.13, -0.24 and -0.01 respectively. The first measure of real earnings management, RM1 (abnormal production costs plus abnormal discretionary expenses)

has a median (mean) of 0.38 (0.03), suggesting the presence of some outliers. REM2 is the second measure of real earnings management, where abnormal cash flow and abnormal discretionary expenses are aggregated. The median (mean) for REM2 is 0.22 (0.01), again suggesting presence of extreme values. The median and means of control variables are as follows: ROA (0.38 and 0.18), size (2.24 and 2.32), leverage (0.994 and 2.44), growth (0.068 and 0.122) and shares (1.873 and 1.830). The distribution suggests some skewness and extreme values in the dataset, and to control for effects of extreme observations, the dataset was winsorized at %.

[Insert Table 5 here]

Table 6 presents correlations between country-level variables used in the regression**.** It indicates that the correlations are all highly positive and significant at 1% except for two cases the correlations are 0.085 and 0.181. Since the correlation is significant and high between most of the variables of investor protection, we run a principle component analysis and find that the variables load on to one factor. We name this investor protection (INV). In our regression analysis, we use the factor loadings from this analysis. Appendix 1 presents the output of the PCA.

[Insert Table 6 here]

RESULTS AND DISCUSSION

Main results

[Insert Table 7 here]

Following Zang (2012) we first perform a correlation analysis between accruals-based and real earnings management. Table 7 shows Pearson correlations between discretionary accruals (DACCR) and the first measure of real earnings management (REM1) is insignificant (0.004) while the Spearman correlation is significantly positive (0.021). The correlation between DAACR and REM2 are significantly positive (Pearson 0.059 Spearman 0.083). This gives us confidence that firms engage

in both real and accruals based earnings management as part of their earnings management strategy, and we do not reject Hypothesis 1.

Our main results are presented in Table 8. Earnings management proxies are regressed against factor loadings from the principal component analysis, which we denote as INV to represent Investor Protection. We find a strong significant relationship for all measures of earnings management with the investor protection factor. Discretionary accruals[7] (2nd column) is significantly negatively related to investor protection at the 5% level, while both real earnings management proxies (3rd and 4th columns) show a significant positive relationship with investor protection.

These results reveal two things: first, that investor protection (higher judicial independence, more board independence, good enforcement of securities laws and accounting standards, minority shareholder protection and larger capital markets) affects the level of earnings management even when all firms are using IFRS standards. That is, holding the quality of standards constant, country-specific factors can explain variations in levels of earnings management. Secondly, investor protection levels affect earnings management in different ways depending on its type: firms in countries with stronger investor protection are likely to have lower levels of accruals based earnings management, but may be compensating for this by taking on real earnings management activities. This means that we do not reject Hypothesis 2.

[Insert Table 8 here]

Investor protection, which is deeply rooted in the legal system of the country as argued by Laporta et al., (2000), does not prohibit cutting some expenses or delaying some projects to meet earnings benchmarks. Moreover, conservative accounting practices are more common in countries with strong judicial systems where firms report bad news faster than firms in countries with weak judicial regimes do (Bushman and Piotroski, 2006). In the existence of conservative accounting, that constrains the opportunistic behaviour of manager, reducing investments can increase the reported

[7] This study used signed accruals since overestimating earnings is of interest, and not downward decreasing earnings. Therefore, the negative relationship between investor protection and accruals metric means that firms domiciled in countries with rigorous investor protection are less likely to boost reported earnings via accruals manipulation.

earnings (e.g. Penman and Zhang, 2002). Ball et al, (2000) found that greater conservatism was associated with strong investor protection systems. Taken together, strong investor protection, which is more likely to be accompanied with conservative accounting, prevents accruals earnings management but does not prohibit the managers from taking real actions to beat the target.

We also find that profitability and size also affect accruals and real earnings management in opposite ways. More profitable firms engage in accruals earnings management, while less profitable firms engage in real earnings management. Cohen and Zarowin (2010) argue that firms with larger net operating assets have more capacity to engage in accruals based earnings management. Less profitable firms may have less flexibility to manage accruals, and would therefore undertake real earnings management. It is worthy to note that Gunny (2005) finds that real earnings management has a long-term impact as it cannot be as easily reversed, and that firms that are less profitable may be damaging themselves in the long term if they are taking on real earnings management activities to address short term earnings targets.

Prior findings suggest that size affects earnings management activities overall. Our results further refine this: Ge and Macvay (2005) find that smaller firms were likely to engage in earnings management relative to larger firms – but larger firms compensate for their visibility by managing earnings in a less obvious way through real activities. Consistent with Zang (2012) who finds that firms undertake both accruals and earnings management, we observe that certain strategies are preferred over others depending on a variety of factors.

Lastly, we consistently observe that with a larger number of shares outstanding, firms opt to engage in less earnings management, whether accruals or real.

Additional analysis

We also repeat the analysis using two other measures: the strength of enforcement of auditing and accounting standards, and the strength of the capital market. While these factors partially captured by the PCA, we are also interested in how the variation in these individual factors affect earnings management practices.

Tables 9 and 10 summarises the findings of the analysis. Consistent with our earlier findings on investor protection, from Table 9 we observe that there is a negative significant effect of the level of accounting and auditing standards enforcement on accruals earnings management, and a positive significant effect with real earnings management. Observed effects on profitability, firm size and number of outstanding shares in this analysis is consistent with the earlier analysis. Again this supports findings by Graham et al (2005) and Cohen et al (2008), where managers opt for real earnings management when there is a higher chance of detection.

[Insert Table 9 here]

This suggests that it is not enough to expect benefits to IFRS, such as better earnings quality (Ball, 2006), to eventuate without jurisdiction specific enforcement of accounting and auditing standards. Our findings are consistent with prior research that suggests an effect of enforcement on earnings quality (e.g. Cai et al., 2008; Houqe et al., 2012). More recently, Glaum et al., (2013) shows that better compliance with some accounting standards across 17 EU countries, namely IFRS3 and IAS36, are associated with strong enforcement and large equity markets. The IASB's objective is to issue enforceable and globally accepted accounting standards based on principles, and supposedly, these standards improve transparency, comparability, and quality of financial reporting (IASB, 2014). However, this objective may not come true with the presence of poor enforcement of accounting standards. The importance of enforcement of accounting standards after IFRS adoption stems from the fact that IASB has no power to enforce its accounting standards. The IASB does not have the power to oblige the members to implement its decision and ensure the compliance. In addition, IFRS are claimed to be principles based accounting standards, hence there is a great room to exercise judgement by the preparers and auditors of financial reporting. The enforcement of IFRS remains the responsibility of local authorities and thus varies from one country to another causing potential differences in the outcomes of IFRS application that hamper the comparability and transparency. In fact, it would be more misleading to investors when companies in a country claim to apply IFRS whereas the compliance with IFRS is weak because of the poor quality enforcement in such country. This demolishes the cornerstone the IASB depended on to legitimise the adoption of its accounting

standards worldwide. These findings highlight the fact that adopting IFRS should be coincided with some enhancements in the quality of local enforcement mechanisms.

We observe the same relationship with capital market strength in Table 10. Firms in stronger capital markets engage in less accruals based earnings management compared to those in weaker capital markets. Conversely, for the same set of firms, real earnings management is higher in stronger capital markets and lower in weaker capital markets. Again this suggests that country specific factors play a role in earnings quality.

[Insert Table 10 here]

This conclusion is in the same line with prior researches that conclude a relationship between the strength of equity markets and the outcomes of IFRS adoption (e.g. Leuz et al., 2003; Glaum et al., 2013). The source of capital fund can affect the quality of financial reporting. Generally speaking, in large equity markets, outsider financing systems, shareholders who are the main source of finance do not have the same access to accounting information their counterparts in insider financing systems do. In small equity markets, the providers of capital such as banks, families or governments have a privileged access to accounting information. Therefore, the need for financial reporting to fulfil the needs of shareholders is greater in large equity markets than in small equity markets. Such need to protect the interests of shareholders might require stronger legislation in countries with large equity market resulting in better earnings quality.

Empirically, our findings show that there is a significant strong correlation between market capitalisation and enforcement of accounting and auditing standards (0.438). Countries with large capital market are characterised with stronger enforcement of accounting standards. In addition, prior research suggests that outsider financing systems are more prevalent in common law countries where the investor protection is strong while insiders systems are more common in Roman law countries (La Porta et al., 1997 and 1998). It seems that large equity market enhances the protection of shareholders which in turn leads to less earnings manipulation. Leuz et al., (2003) suggests that strong equity market complements investor protection.

In sum, our findings suggest that:

I. Firms worldwide engage in both accruals and real earnings management at the same time.

II. Accruals earnings management are less pronounced in countries of relatively strict investor protection, stronger enforcement of accounting and auditing standards and large capital market.

III. Real earnings management activities are more pronounced in countries with strong institutions.

IV. The implementation of IFRS alone, without uniformity or harmonisation of country-specific factors, is not sufficient for firms to be able to reap the advertised benefits of IFRS standards.

CONCLUSION

We examine the effect of institutions on both accruals and real earnings management across countries that mandate IFRS based accounting standards. Although prior research has investigated the effect of institutions on accruals manipulation across different countries, ours is the first paper to examine the real manipulation activities in addition to accruals one in an international context. To capture discretionary accruals, we use the modified Dechow and Dichev model. To capture real earnings management, we follow Roychowdhury (2006) and Cohin and Zarowin (2010) and measure the abnormal level of cash flow from operations, discretionary production costs and discretionary expenses.

The overall results suggest that accruals earnings management are less likely in countries with stringent investor protection, strong accounting standards enforcement and large capital market. This conclusion is consistent with previous studies (e.g. Leuze et al., 2003. Houque at al., 2012). The results also show that firms engage in both streams of earnings management activities, the accruals and the real which is in the same line with previous studies (e.g Cohin and Zarowin, 2010 and Zang, 2012). With respect to real earnings management, the results indicate that firms in countries with strong institutions tend to manage earnings via real activities more than accruals ones. The study

points up the insufficiency of applying a common set of accounting standards alone to obtain consistent accounting outcomes across different jurisdictions.

We acknowledge several limitations inherent in this study. Firstly, countries included in the sample had followed different approaches to apply IFRS, thus, the differences in IFRS versions might be an influencing factor on the differences in earnings quality. Secondly, some omitted variables might be biased, for example, ownership concentration and tax system may have an influence on financial reporting quality. Furthermore, one can question the validity of investor protection measure since there is neither straightforward nor uncontroversial measure of investor protection.

Notwithstanding these limitations, our findings are important in that it highlights the effect of institutional factors on both accruals and real earnings management across 23 countries mandating IFRS application. To best of our knowledge, this study is the first to examine the effect of some institutional factors on real earnings management worldwide. Furthermore, this study uses the most recent indicators of institutional factors annually which would be useful to capture the effect if any change in institutions over time. Prior researches mainly focus on whether the switch to IFRS has enhanced earnings quality whereas this study concentrates on the effect of other institutions on the quality. The findings draw the attention to the need for improving other local institutional factors to secure the desired outcomes of IFRS adoption; high quality, comparable and transparent financial reporting across the globe.

Appendix 1 Principal-component factors

Factor analysis/correlation		Number of obs =	16328
Number of comp. =	6		
Trace =	6		
Rotation: (unrotated)			

Component	Eigenvalue	Difference	Proportion	Cumulative
Factor1	**4.30653**	3.27801	0.7178	0.7178
Factor2	1.02852	0.648666	0.1714	0.8892
Factor3	0.379858	0.229325	0.0633	0.9525
Factor4	0.150533	0.0537963	0.0251	0.9776
Factor5	0.0967371	0.0589202	0.0161	0.9937
Factor6	0.0378169	.	0.0063	1

LR test: independent vs. saturated: chi2(15) = 1.1e+05 Prob>chi2 = 0.0000

Factor loadings (pattern matrix) and unique variances

Variable	Factor 1	Uniqueness
BIND	0.9083	0.175
SEC	0.9056	0.018
MIN	0.9228	0.1485
ACC	0.9772	0.045
JUD	0.8565	0.2663
MS	0.3483	0.8787

Kaiser-Meyer-Olkin measure of sampling adequacy

Variable	kmo
BIND	0.7303
SEC	0.8599
MIN	0.8329
ACC	0.7329
JUD	0.8668
MS	0.2533
overall	0.7468

Appendix 2:

Country	IFRS version for domestic listed companies	Year of adoption	Modification of a principle	IFRS for domestic listed companies		IFRS for foreign listed companies		"WS.AcctgStandardsFollowed" By Worldscope database
				Consolidated	Individual	Required	Permitted	
Australia	Australian IFRS equivalents	2005	Yes	Yes	Yes	-	Yes	23
Austria	IFRS as adopted by the EU	2005	Yes	Yes	No	-	Yes	23
Belgium	IFRS as adopted by the EU	2005	Yes	Yes	**No**	-	Yes	23
Bulgaria	IFRS for Banks IFRS as issued by the IASB IFRS as adopted by the EU	1997 2003 **2007**	Yes	Yes	Yes	-	Yes	23
Denmark	IFRS as adopted EU	2005	Yes	Yes	permitted	-	Yes	23
Finland	IFRS as adopted by EU	2005	Yes	Yes	permitted	-	Yes	23
France	IFRS as adopted by EU	2005	Yes	Yes	**No**	-	Yes	23
Germany	IFRS as adopted by EU	2005	Yes	Yes	**No**	-	Yes	23
Greece	IFRS as adopted by EU	2005	Yes	Yes	Yes	-	Yes	23
Hong Kong	(HKFRSs) identical to IFRS	2005	Yes	Yes	Yes	-	Yes	01, 23
Italy	IFRS as adopted by EU	2005	Yes	Yes	Yes	-	Yes	23
Jordan	IFRS as issued by the IASB	1997	Yes	Yes	Yes	Yes	-	23
Netherlands	IFRS as adopted by	2005	Yes	Yes	permitted	-	Yes	23

	EU							
Norway	IFRS as adopted by EU	2005	Yes	Yes	Permitted	-	Yes	23
Oman	IFRS as issued by the IASB	1986	No	Yes	Yes	-	-	23
Philippines	(PFRS)) equivalent to IFRS	2005[8]	Yes	Yes	Yes	PFRS is required	-	01
Poland	IFRS as adopted by EU	2005	Yes	Yes	Permitted	-	Yes	23
Portugal	IFRS as adopted by EU	2005	Yes	Yes	Permitted	-	Yes	23
Singapore	(SFRS) equivalent to IFRS	2005	Yes	Yes	Yes	-	Yes	01, 23
South Africa	IFRS as issued by the IASB	2005	No	Yes	Yes	**Yes (for some)**	**Yes (for others)**	23
Spain	IFRS as adopted by the IASB	2005	Yes	Yes	**No**	-	**Yes**	23
Sweden	IFRS as adopted by the IASB	2005	Yes	Yes	**No**	-	**Yes**	23
UK	IFRS as adopted by EU	2005	Yes	Yes	permitted	-	Yes	23

Main source: the profiles of jurisdictions as reported by IFRS Foundation. See: http://www.ifrs.org/use-around-the-world/Pages/Jurisdiction-profiles.aspx

[8] http://www.worldbank.org/ifa/rosc_aa_phl_2006.pdf

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Table 1: Descriptions of Variables

Variables	Measure	Description	Data source
Dependent variable			
Earnings management	DACCR (discretionary accruals	Modified DD	WorldScope
	Real earnings management REM1	Cohen and zarwoin (2010)	WorldScope
	Real earnings management REM2	Cohin and zarwoin (2010)	WorldScope
Independent variables			
Institutional factors	JUD= Judicial Independence	To what extent is the judiciary in a country independent from influences of members of government, citizens, or firms? (1 = heavily influenced; 7 = entirely independent0	World Economic Forum (2008-2011)
	BIND = Board Independence	The characteristics of corporate governance by investors and boards of directors in a country? [1 = management has little accountability to investors and boards; 7 = investors and boards exert strong supervision of management decisions]	World Economic Forum (2008-2011)
	SEC = the enforcement of securities laws	The regulation and supervision of securities exchanges in a country? (1 = ineffective; 7 = effective)	World Economic Forum (2008-2011)
	ACC= enforcement of auditing and accounting standards	Financial auditing and reporting standards regarding company financial performance? (1 = extremely weak; 7 = extremely strong)	World Economic Forum (2008-2011)
	MIN= protection of minority shareholders	to what extent are the interests of minority shareholders protected by the legal system? (1 = not protected at all; 7 = fully protected)	World Economic Forum (2008-2011)
	Market size= Market capitalization	the share price times the number of shares outstanding as a percentage of GDP	The World Bank (2007-2010)
Control variables	**ROA =** return on assets	net income divided by total assets	WorldScope
	Size =firm's size	natural logarithm of total assets firm i in year t	WorldScope
	Lev =leverage	end of year total liabilities divided by end of year equity book Value for firm i in year t	WorldScope
	Growth= firm's growth	sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1	WorldScope

	Shares = firm's shares	natural logarithm of outstanding shares for firm i in year t.	WorldScope

The overall observation from 2007 to 2010	40724
less: Financials and Utilities	-8584
less : Observations in industries lower than six firms	-348
less: Observations with missing variables for dependent variable and independent variables	-15464
The observations used for 4082 firms from 2007 through 2010	16328

Table 2: the sample

Table 3 : Distribution of sample by industry and country

Country	Energy	Materials	Industrials	Cons.discre	Cons.staples	Health care	infor.tec	Infor.services	Total
Australia	100	172	344	276	88	140	152	36	1308
Austria	0	0	60	32	0	0	0	0	92
Belgium	0	36	36	32	36	40	68	0	248
Bulgaria	0	32	92	60	48	0	0	0	232
Denmark	0	24	128	68	0	52	36	0	308
Finland	0	36	136	64	28	0	72	0	336
France	32	132	336	412	136	116	416	0	1580
Germany	0	88	384	324	72	156	396	0	1420
Greece	0	136	192	192	104	28	56	0	708
Hong Kong	48	200	424	744	164	112	452	40	2184
Italy	28	52	160	236	44	36	88	0	644
Jordan	0	56	52	88	44	0	0	0	240
Netherlands	0	24	88	48	40	0	72	0	272
Norway	124	0	120	28	40	32	68	0	412
Oman	0	52	40	24	32	0	0	0	148
Philippines	28	24	48	68	56	0	0	24	248
Poland	0	64	148	144	64	0	64	0	484
Portugal	0	28	36	52	0	0	0	0	116
Singapore	56	128	452	208	132	36	252	0	1264
S.Africa	0	124	108	116	64	0	48	0	460
Spain	0	56	80	52	32	44	0	0	264
Sweden	0	52	236	120	40	100	216	0	764
Uk	148	204	772	628	156	180	472	36	2596
Total	388	1492	3652	3320	1208	892	2456	76	16328
%	0.023	0.0931	0.223	0.203	0.073	0.0546	0.15	0.004	100

Notes to table 2: the firms in the sample are classified by 2-digits GICS. Financials and Utilities are excluded; therefore, there are eight broad industry groups.

Table 4: **The median of country-level variables**

DACCR	A-PROD	A-DISX	A-CFO	REM1	REM2	MS	JUD	BOIN	SEC	MIN
0.0064	0.0303	-0.0523	0.0012	0.0774	0.0385	120.2745	6.3	5.675	5.775	5.35
0.0028	-0.0012	-0.0258	0.0003	0.0376	0.0311	27.59132	5.875	5.175	4.975	5.15
0.00002	0.0061	-0.0011	-0.0051	0.0116	0.0057	57.44162	5.4	5.15	5.15	5.125
0.0015	0.0053	-0.0064	-0.0016	0.0071	-0.00007	24.67731	2.925	4.125	3.625	3.575
-7.99E-10	0.0034	-0.0038	-0.0034	0.0169	0.00981	65.38956	6.5	5.425	5.65	5.625
1.40E-09	0.0004	-0.0075	0.0022	0.0037	0.0097	73.74942	6.45	5.575	5.75	5.875
0.0026315	0.0281	-0.0432	-0.0028	0.0743	0.0352	77.71657	4.95	5.125	5.45	4.9
0.0040767	0.0202	-0.0321	-0.0048	0.0550	0.0297	44.19684	6.4	5.325	5.125	5.3
0.0008992	0.0027	-0.0184	-0.0026	0.0121	0.0093	38.77543	3.65	4	4.45	4.9
-0.0001151	0.0173	-0.0211	-0.0063	0.0414	0.0228	513.781	6.05	4.925	5.625	5.1
0.0008883	0.0082	-0.0245	-0.0004	0.0485	0.0289	25.90016	3.55	3.975	4.275	3.575
0.0007583	0.0009	-0.0061	0.0055	0.0117	0.0024	163.6504	4.75	4.55	5.025	5.075
7.07E-10	0.0071	-0.0366	0.0005	0.0382	0.0247	80.06262	6.35	5.4	5.45	5.25
0.000361	-0.0046	-0.0192	-0.0023	0.0092	0.0106	59.81944	6.2	5.55	5.8	5.8
6.52E-10	0.0013	-0.0036	-0.0006	0.0016	0.0049	37.90293	5.15	4.925	5.3	5.25
5.30e-10	.0046818	-.0083777	-.0034649	.0286785	.0064624	58.35719	3	4.75	4.2	4.2
0.0022686	-0.0009	-0.0090	-0.0010	0.0221	0.0127	34.41975	4.1	4.425	4.925	4.35
3.34E-10	0.0005	-0.0017	0.0006	0.0057	0.0029	40.64495	4.525	4.4	5	4.675
0.0012135	0.0066	-0.0149	0.0004	0.0185	0.0155	167.0155	5.725	5.625	5.875	5.625
-0.0006929	0.0117	-0.0022	-0.0069	0.0151	0.0141	223.6196	4.975	5.75	6.1	5.625
0.000071	0.0033	-.01422	.00010	0.0286	0.0072	89.56253	4.025	4.6	4.15	4.4
0.0049225	0.0078	-.02703	0.0067	0.0436	0.0125	104.1146	6.575	5.95	6	6.025
0.0053208	0.0252	-0.0385	0.0006	0.0676	0.0394	118.0574	6.075	5.275	5.05	5.25

DACCR is the level of abnormal accruals. Abnormal accruals are estimated using cross-sectional Jones (1991) model; A_PROD represents abnormal production costs, where production costs are the sum of cost of goods sold, and the change in inventories. A_DISX is abnormal discretionary expenses, where discretionary expenses are the difference between operation income and gross income from Worldscope (SG&A expenses, R&D expenses and advertising expenses are included). A_CFO represents the level of abnormal cash flow from operations. REM1 is the first measure of real earnings management. REM1 is the first measure of real earnings management computed by adding abnormal production costs to the abnormal discretionary expenses multiplied by negative one. REM2 is the second measure of real earnings management, which is the aggregation of both abnormal cash flow and abnormal discretionary expenses after multiplying them by negative one. BIND is the board independence scores from World Economic Forum (2008-2011). SEC is the enforcement of securities laws scores from World Economic Forum (2008-2011). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008-2011). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008-2011). JUD is the judicial independence scores from World Economic Forum (2008-2011). MS measures market strength and is the market capitalisation from the World Bank (2007-2010), defined as is the share price times the number of shares outstanding as a percentage of GDP.

Table 5: Descriptive statistics for firm-level regression variables (N = 16328)

Variables	Mean	Std.Dev	25%Percentiles	Median	75%Percentiles
DACCR	.000	.065	-.0287	.001	.033
A_PROD	.000	.221	-.080	.013	.108
A_DISX	.000	.206	-.091	-.024	.051
A_CFO	.000	.125	-.0535	-.001	.052
REM1	.003	.359	-.120	.038	.192
REM2	.001	.212	-.082	.022	.119
ROA	.018	.136	.0004	.038	.078
Size	2.32	.875	1.72	2.24	2.87
Lev	2.44	7.10	.424	.994	1.93
Growth	.122	.389	-.080	.0675	.243
Shares	1.83	.92	1.145	1.873	2.53

DACCR, A_PROD A_DISX, A_CFO, REM1 and REM2 is as defined in Table 4. ROA is return on assets, defined as net income divided by total assets. Size is the natural logarithm of total assets for firm i in year t. Lev is the end of year total liabilities divided by end of year equity book Value for firm i in year t. Growth is the sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1. Shares is the natural logarithm of outstanding shares for firm i in year t. All variables are winsorized at p0.01

Table 6: Correlation matrix for country-level regression variables

	BIND	SEC	MIN	ACC	JUD	MS
BIND	1					
SEC	.800***	1				
MIN	.869***	.805***	1			
ACC	.888***	.864***	.894***	1		
JUD	.805***	.628***	.779***	.835***	1	
MS	.085***	.388***	.181***	.438***	.307***	1

*** p<0.01, ** p<0.05, * p<0.1

Notes to table 6: BIND is the board independence scores from World Economic Forum (2008-2011). SEC is the enforcement of securities laws scores from World Economic Forum (2008-2011). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008-2011). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008-2011). JUD is the judicial independence scores from World Economic Forum (2008-2011). MS is the market capitalisation from the World Bank (2008-2011), defined as is the share price times the number of shares outstanding.

Table 7: Correlation matrix among earnings management proxies

	DACCR	REM1	REM2
DACCR	1	0.0203***	0.0813***
REM1	0.0045	1	0.864***
REM2	0.059***	.9108***	1

*** p<0.01, ** p<0.05, * p<0.1

Notes to table 7: this table reports Pearson (lower triangle) and Spearman (upper triangle) correlation. DACCR is the level of abnormal accruals. Abnormal accruals are estimated using modified DD; REM1 is the first measure of real earnings management computed by adding abnormal production costs to the abnormal discretionary expenses after multiplying it by negative one. REM2 is the second measure of real earnings management, which is the aggregation of both abnormal cash flow and abnormal discretionary expenses after multiplying them by negative one.

Table 8: Investor protection analysis

Independent Variables	(1) DACCR Coefficient *t-value*	(2) REM1 Coefficient *t-value*	(3) REM2 Coefficient *t-value*
ROA	0.230	-0.3159	-0.334
	*27.62***	*-7.90***	*-13.72****
Size	-0.0049	0.0165	0.011
	*-4.65****	*2.45****	*3.21***
LEV	0.0002**	-0.0006	-0.000
	2.00	*-0.72*	*-0.38*
Growth	-0.0012	-0.0325	-0.066
	-0.59	*-4.34****	*-3.96****
Shares	-0.0017	-0.0133	-0.0066
	*-3.15***	*-3.02***	*-2.31***
INV	-0.0009	0.0087	0.0057
	-2.31*	***2.83 ****	***2.67****
Constant	0.010	-0.00009	-0.004
	2.48**	1.25	-0.27
Observations	16,328	16,328	16,328
R-squared	0.227	0.0172	0.0491

Clustered by firm and year. *** p<0.01, ** p<0.05, * p<0.1.

Notes to table8: OLS regression of investor protection against independent variables as specified. ROA is return on assets, defined as net income divided by total assets. Size is the natural logarithm of total assets for firm i in year t. Lev is the end of year total liabilities divided by end of year equity book Value for firm i in year t. Growth is the sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1. Shares is the natural logarithm of outstanding shares for firm i in year t. INV is the investor protection computed by component principle analysis of six variables. These variables are: BIND is the board independence scores from World Economic Forum (2008-2011). SEC is the enforcement of securities laws scores from World Economic Forum (2008-2011). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008-2011). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008-2011). JUD is the judicial independence scores from World Economic Forum (2008-2011). MS is the market capitalisation from the World Bank (2007-2010), defined as is the share price times the number of shares outstanding as a percentage of GDP.

Table 9: Enforcement of auditing and accounting standards

Independent Variables	(1) DACCR Coefficient *t-value*	(2) REM1 Coefficient *t-value*	(3) REM2 Coefficient *t-value*
ROA	0.230	-0.3165	-0.3347
	*27.58***	*-7.94***	*-13.83***
Size	-0.0049	0.0166	0.0111
	*-4.77***	*2.49***	*3.27***
LEV	0.0002	-0.0001	-0.0001
	*1.98***	*-0.66*	*-0.33*
Growth	-0.0012	-0.0322	-0.0225
	-0.60	*-4.45***	*-4.03***
Shares	-0.0016	-0.0139	-0.007
	*-2.93***	*-3.13***	*-2.46***
Enforcement	-0.0021	0.0172	0.0115
	*-3.42***	*(3.05***	*3.08***
Constant	0.022	-0.0976	-0.0676
	*4.67****	-2.76**	-3.29***
Observations	16,328	16,328	16,328
R-squared	0.2209	0.0173	0.0492

Clustered by firm and year. *** p<0.01, ** p<0.05, * p<0.1

Notes to table 9: OLS regression of enforcement of auditing and accounting standards against independent variables as specified ROA is return on assets, defined as net income divided by total assets. Size is the natural logarithm of total assets for firm i in year t. Lev is the end of year total liabilities divided by end of year equity book Value for firm i in year t. Growth is the sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1. Shares is the natural logarithm of outstanding shares for firm i in year t. Enforcement is the enforcement of auditing and accounting standards scores from World Economic Forum (2008-2011).

Table 10: Strength of capital market

	(1)	(2)	(3)
Independent Variables	DACCR Coefficient *t-value*	REM1 Coefficient *t-value*	REM2 Coefficient *t-value*
ROA	0.2313	-.2802	-0.339***
	*28.96****	*-8.31****	*-14.20****
Size	-0.0056	.0153	0.0138***
	*-5.41****	*2.72***	*3.63****
LEV	0.0002	-.0002	-0.000
	*1.85**	*-0.43*	*-0.05*
Growth	-0.0012	-.0276	-0.022***
	-0.60	*-4.25****	*-4.05****
Shares	-0.001	-.0198	-0.0132**
	-0.19	*-3.40***	*-3.17***
MS	-0.000	.0000	0.00007**
	*-2.93***	*2.55***	*2.91***
Constant	.0115	.0069	-0.011
	2.91**	0.59	-1.01
Observations	16,328	16,328	16,328
R-squared	0.221	0.0179	0.05

Clustered by firm and year. *** p<0.01, ** p<0.05, * p<0.1

Notes to table 10: OLS regression of capital market strength (MS) against independent variables as specified. ROA is return on assets, defined as net income divided by total assets. Size is the natural logarithm of total assets for firm i in year t. Lev is the end of year total liabilities divided by end of year equity book Value for firm i in year t. Growth is the sales growth rate, defined as the sales in year t minus sales in year t-1 and scaled by sales in year t-1. Shares is the natural logarithm of outstanding shares for firm i in year t. MS is the market capitalisation from the World Bank (2007-2010), defined as is the share price times the number of shares outstanding as a percentage of GDP.