

**THE EFFECT OF INVESTOR PROTECTION AND
IFRS ADOPTION ON EARNINGS QUALITY
AROUND THE WORLD**

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The effect of Investor Protection and IFRS Adoption on Earnings Quality around the World

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Abstract

This study examines the effect of investor protection and IFRS on the quality of accounting earnings for forty-six countries around the globe. Two attributes of accounting earnings are studied: the magnitude of discretionary accruals, and the avoidance of loss reporting. The results suggest that IFRS adoption per se does not lead to increased earnings quality, at least based on the earnings attributes studied in our study. Specifically, accounting earnings quality improves as investor protection regimes become stronger, but only for IFRS adopting countries, that is, the effect of investor protection is mediated through the adoption of IFRS. The results highlight the importance of accounting enforcement to financial reporting quality and the need for standard setters and policy makers to design mechanisms that will limit managers' earnings management practices.

Key words: *Earnings quality, Discretionary accruals, micro governance, and macro governance etc*

JEL classification: J3; K2; M4.

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1. Introduction

The Conceptual Framework identifies relevance and reliability as the key qualitative characteristics determining the usefulness of accounting information for making economic decisions. Accounting earnings information is relevant when it influences users' decisions by helping them to form predictions and/or confirm or correct past judgments. Accounting earnings information is reliable if it can be depended upon to faithfully represent, without bias or undue error, the transactions or events that it professes to represent (Statement of Accounting Concepts – SAC 3 [Australia]; Statement of Financial Accounting Concepts – SFAC 2 [US]). Recent research suggests that strong investor protection, strong legal enforcement, and a common law legal system are fundamental determinants of high-quality financial statement numbers (La porta et al. 1998; 2000; 2006; Leuz et al. 2003; Ball et al. 2000; Ball et al. 2003; Nabar and Boonlert U-Thai 2007; Francis and Wang 2008; and Daske et al. 2008). However, a further likely important determinant of the quality of accounting information is adoption of International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB). Around 100 countries have now adopted IFRS, including the EU countries, Australia, New Zealand and many developing countries. While this has resulted in a substantial reduction in national accounting differences, there continue to be significant differences in earnings quality.¹

The present international accounting scene provides a good opportunity to address the impact of international governance arrangements – corporate, political,

¹ Possible differences in the quality of earnings across IFRS countries might relate to variance in enforcement (Sunder 1997).

judicial and bureaucratic – on earnings quality. We argue that earnings quality is a joint function of investor protection and the quality of accounting standards, as proxied by IFRS. The broad premise of our study is based on the established argument that accounting does not exist in a vacuum, rather it ‘is a product of its environment’ (for example, Karim 1995; Mueller 1968; Nobes 1988 and 1992). Therefore, poor earnings quality is more likely to take place in countries with lower investor protection and absence of IFRS. In succinct terms, lower investor protection breeds managerial discretion and managerial discretion in the organization impedes production of high quality accounting numbers, even given high quality accounting standards. Accounting corruption would tend to go hand-in-hand with socio-political corruption. Clean and reliable financial information, therefore, remain elusive in a low investor protection environment.

This paper contributes to the literature that examines how country-level corporate governance such as, the regulatory system and the existence and enforcement of laws, and other institutional factors affect the quality of reported financial information. Two attributes of earnings are examined that have been widely used in the prior literature: the magnitude of signed discretionary accruals, and avoidance of reporting loss. Using a sample of over 115,608 firm year observations from 46 countries for the years 1998 -2007, we show that IFRS is an important institutional factor that affects a country’s earnings quality, and this effect exists even after controlling for investor protection, legal enforcement, a country’s economic development. We highlight the importance of the regulatory system, investor protection, and law enforcement; but at the same time IFRS is important. These findings are consistent with the argument that cross-country differences in accounting

quality are likely to remain after IFRS adoption until all institutional differences are removed (Soderstrom and Sun 2007; and Daske et al. 2008).

The rest of the paper is organized as follows. The next section begins with a theoretical framework that outlines the expected determinants of earnings quality. Then, our hypotheses are developed on the basis of this conceptual framework. Section 3 develops our investor protection variables. Section 4 describes the measures for the dependent, independent and control variables and the sample selection procedure. Section 5 presents our empirical results. The study concludes in section 6.

2. Theoretical Framework and hypothesis development

According to Soderstrom and Sun (2007), there are three possible scenarios regarding IFRS and accounting quality around the world. The first scenario is that adopting a common set of accounting standards improves earnings quality through the ease of monitoring and comparison of financial reports across borders, which puts pressure on management to report true and fair view and engage in less earnings management activities. Using this line of thought, Ewert and Wagenhofer (2005) find that high quality accounting standards reduce earnings management and improve reporting quality. Similarly Schipper (2005) argues that the adoption of IFRS in the European Union (EU) provides a more powerful setting to test the determinants and economic consequences of accounting quality because accounting standards across EU countries are now the same. Barth et al. (2006) suggest that firms that adopt IFRS are less prone to engage in earnings smoothing and are more likely to recognize losses in a timely manner.

Contrary to above arguments, van Tendeloo and Vanstraelen (2005), and Lin and Paananen (2007) examine the discretionary accruals of German firms adopting

IFRS and find that IFRS firms have more discretionary accruals and a lower correlation between accruals and cash flows. Similarly Paananen (2008) investigates whether the quality of financial reporting in Sweden increased after the adoption of IFRS and finds that the quality of financial reporting (measured as smoothing of earnings) decreased after the adoption of IFRS. Platikanova and Nobes (2006) compare the information asymmetry component of the bid-ask spread among companies before and after the EU's adoption of IFRS in 2005. They find a larger volatility in the information asymmetry for UK and German companies. They also find that companies from countries where earnings management is more common exhibit a *lower* information asymmetry component compared to other groups of countries. They interpret this result as indicating that income smoothing reduces information asymmetry.

The second scenario is that earnings quality is also significantly determined by a country's overall institutional system i.e. legal and political systems (Ball et al. 2000; 2003) so that the impact of IFRS adoption on earnings quality will vary across countries. Leuz et al. (2003) examined the relationship between investor protection and earnings management across 31 countries using non-financial industry data. They find that strong investor protection at a country level reduces the earnings management activities of firms which leads to higher accounting quality. Following the above studies, Shen and Chih (2005) use banking industry data to calculate earnings management across 48 countries based on the methodologies of DeGeorge et al (1999) and Burgstahler and Dichev (1997). Their results show that accounting disclosure (proxied by strong legal enforcement) more effectively explains variations in earnings management across countries. Similarly, prior research indicates that in countries with strong investor protection regimes there is greater financial

transparency (Bhattacharya et al. 2003; Bushman et al. 2004), and less earnings management - all of which can be interpreted as evidence of higher accounting quality (Ball et al. 2000; Hung 2000; La porta et al. 1998, 2000, 2006; Daske et al. 2008). Ball et al. (2003) argue that adopting high quality standards might be a necessary condition for acquiring high quality information, without being a sufficient one .i.e. country level investor protection.

The third scenario draws on recent research by Burgstahler et al. (2007). They examine the relation between earnings management and the interaction among ownership structure, capital market structure and development, tax system, accounting standards, and investor protection. They find that strong legal systems are associated with higher quality earnings. Similarly, Leuz et al. (2003) find that firms in countries with developed equity markets, dispersed ownership, strong investor rights, and legal enforcement engage in less earnings management i.e. high quality earnings. Ding et al. (2007) investigate how a country's legal systems, economic development, the importance of stock markets, and ownership concentration shape the countries accounting standards, which in turn affect the country's quality of financial reporting. Soderstrom and Sun (2007) argue that cross-country differences in accounting quality are likely to remain following IFRS adoption, because accounting quality is a function of the firm's overall institutional setting, including the legal and political system of the country in which the firm resides.

In recent studies, researchers argue that the enforcement of accounting standards is an important as the accounting standards (e.g. Sunder 1997). Strong IFRS enforcement puts pressure on management and auditors who are thus less prone to exercise discretion (FEE, 2002, 29). Holthausen (2003) provides evidence that

adopting IAS² with weak investor protection will likely lead to ruining the perceived quality of the international accounting standards, and suggests that it would be useful for the literature to begin to structure and quantify the country descriptions by developing more informative tests. Yu (2005) finds that IAS, accrual-based accounting standards, accounting standards with increased disclosure requirements, and separation of tax and financial reporting all constrain earnings management. He also suggests that high quality accounting standards decrease analyst forecast error. Hope (2003) develops a comprehensive measure of accounting standards enforcement and suggests that strong investor protection encourages managers to follow the rules.

Based on the above arguments, the relevant research questions are:

Hypothesis 1: Earnings quality is positively associated with investor protection.

Hypothesis 2: Earnings quality is positively associated with IFRS adoption.

Hypothesis 3: Earnings quality is positively associated with the interaction effect between investor protection and IFRS adoption.

3. Investor protection Variable

We use multiple investor protection measures because single country-level metrics are likely to be subject to measurement error and because there are multiple dimensions to the concept of investor protection. This testing of multiple measures is common in cross-country research and greater confidence is held in the results if they are consistent across the different measures.

Ball, Robin, and Wu (2003) study the influence of the incentives of managers and auditors on the properties of reported accounting numbers under high quality accounting standards. However, they find that earnings reported in four East Asian countries exhibit properties similar to code law accounting, even though these countries have common law standard setting and their (then) recent standards closely

² IAS were the predecessors of IFRS.

resemble International Accounting Standards. They conclude that auditor and manager incentives influence choice among accountings standards, and thus the quality of reported earnings. Similarly, Francis and Wang (2008) find that earnings quality is higher as the country's investor protection regime becomes stronger, but only for firms with Big 4 auditors. External stakeholders expect a Big 4 auditor to limit earnings management and, more generally, ensure fair financial reporting. Thus, stakeholders are more likely to sue the auditor if they perceive a failure in financial reporting (Palmrose 1987, 1988; Stice 1991; Francis et al. 1994; Lys and Watts 1994).

The public company accounting oversight Board (PCAOB) explains:

The media, litigants, the congress, and others often allege, rightly or wrongly, that audit failures contributed to many business failures. In that context, the public views audit failure as including not only the failure to discover and report material negative facts, but also the failure of financial statements to serve as an adequately early-warning device for the protection on investors and creditors.

DeAngelo (1981) explain that Big 4 auditors in the US impose a high level of earnings quality in order to protect their brand name from legal exposure and reputation risk which can arise from misleading financial reports by clients and, in particular, from overly optimistic earnings reports. Similarly, Krishnan (2003) finds that Big 4 auditors mitigate accruals-based earnings management more than non Big 4 auditors and, therefore influence the quality of earnings. If this observation is right then we should observe similar results in other countries with strong investor protection. So our first measure of investor protection is Big 4 versus non-Big 4 auditors and is coded 1 for firms audited by Big 4 auditors and 0 otherwise.

Our other measures of investor protection are indexes of: board effectiveness, enforcement of securities laws, protection of minority shareholder rights, enforcement of accounting & auditing standards, and judicial independence, all provided by the World Economic Forum (2008). The measures are coded from 1 to 7 with, for example, a value of 1 for the board effectiveness index signifying that management

has little accountability and 7 signifying that boards exert strong supervision of management decisions. We also include a measure of the freedom of the press (World Bank 2006)

Boards play an important role as independent scrutinizers of management actions, and in protection of shareholder wealth. The literature on governance emphasises the role played by independent boards in ameliorating agency problems between the divergent interests of the shareholders and management of the company through monitoring of managerial behaviour (Peasnell et al 2005). Moreover, Fama (1980) argues that independent directors have an incentive to protect shareholders wealth in their role on the board of directors in order to protect the value of their reputation capital. Peasnell et al (2006), Houqe et al. (2009) and Ebrahim (2007) find that companies with a high proportion of independent directors on the board tend to have lower abnormal accruals. Liu and Lu (2002) find that the earnings management endeavors of managers in China are constrained to a certain extent if firms are dominated by outside directors and the shares are traded by foreign investors.

From Hung (2000), Ball et al. (2000), Leuz et al. (2003), Daske et al. (2008), Laporta et al. (1998, 2000, 2006), and Francis and Wang (2008), it follows that countries with weak protection for minority shareholders interests provide greater incentives as well as opportunities for managers to engage in corrupt accounting practices.

Enforcement of securities laws may deter insiders from manipulating earnings to profit from trading in the firm's shares (Hope 2003). Beneish and Vargus (2002) provide evidence that insider trading is associated with earnings management. Aboody et al. (2005) find that privately informed traders earn greater profits when trading stocks with high earnings quality risk factors.

Economic theory proposes that a strong institutional setting arises to alleviate information and transaction costs. Much empirical work has tackled issues related to the importance of institutions and their impact on economic activity in general. The presence of legal institutions that safeguard the interests of investors is an integral part of financial development. Reforms that bolster a country's legal environment and investor protection are likely to contribute to better growth prospects.

4. Research Design and Sample selection

We use the level of discretionary accruals and avoidance of loss reporting as our measures of earnings quality.

4.1 Discretionary Accrual Analysis

In contrast to Healy (1985) and DeAngelo (1986) who consider the nondiscretionary component of total accruals to be constant, Jones (1991) proposes a model that relaxes the assumption of constant nondiscretionary accruals. Dechow et al. (1995) find that the modified Jones model (1991) provides the most powerful test of earnings management. More recently, Bartov et al. (2000) estimate the ability of seven accruals models to detect earnings management. Bartov et al. (2000) conclude that the cross-sectional Jones model and the cross sectional modified Jones model perform better than their time series counterparts in detecting earnings management. Other advantages of using these cross-sectional models are larger sample size and a lower risk of survivorship bias relative to time series models. We thus use the cross-sectional modified Jones model to estimate discretionary accruals.

Estimation of discretionary accruals involves two steps. First nondiscretionary accruals are estimated using the cross-sectional variation of the modified Jones model, as in Krishnan (2000). This model estimates total accruals as a function of the change

in revenue (adjusted for the change in receivables) and the level of property plant and equipment.

$$TA_{ijt}/A_{it-1} = \alpha_{jt} (1/A_{it-1}) + \beta_1 (\Delta REV_{it} - \Delta REC_{it}/A_{it-1}) + \beta_2 (PPE_{it}/A_{it-1}) + e_{it} \dots \dots \dots (1)$$

Where TA_{it} is total accruals, $\Delta REV_{it} - \Delta REC_{it}$ is the change in revenue (adjusted for the change in receivables) of firm i , in industry j , for the period $t-1$ to t , PPE_{it} is gross property, plant, and equipment of firm of firm i , for the period t all scaled by lagged total assets. Total accruals are calculated as the difference between operating income and cash flow from operations.

Consistent with prior studies, fitted values from model (1) are defined as nondiscretionary (expected) accruals. The estimated error term from model (1) (the difference between total accruals and nondiscretionary accruals) represents the unexplained or discretionary accruals. Dechow et al. (1995) rationalize this choice by noting that:

The original Jones model implicitly assumes that discretion is not exercised over revenue in either the estimation period or the event period. The modified version of the Jones model implicitly assumes that all changes in credit sales in the event period result from earnings management. This is based on the reasoning that it is easier to manage earnings by exercising discretion over the recognition of revenue on credit sales than its is to manage earnings by exercising discretion over the recognition of revenue on cash sales.

[Insert Table 1 here]

The variables and their measures used in this study are summarized in Table I. The models in equation (4) & (5), below, test if the level of discretionary accruals (earnings quality) varies as a function of a country’s investor protection environment and IFRS adoption (mandatory and voluntary), plus a set of controls for other factors that may affect accruals.

$$DACCR_{it} = \beta_0 + \beta_1 MAN_IFRS_{it} + \beta_2 INVPRO + \beta_3 MAN_IFRS_{it} * INVPRO_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 CFO_{it} + \beta_8 CAPITALINTENSITY_{it} + \beta_9 LOSS_{it} + \text{fixed effects} + e_{it} \dots \dots \dots (4)$$

where,

$DACCR_{it}$ = discretionary accruals scaled by lagged total assets for firm i in year t .
 MAN_IFRS_{it} = A dummy variable that takes the value of 1 for a given country in the years after mandatory IFRS adoption and 0 otherwise.
 $INVPRO_{it}$ = investor protection, measured seven ways:

1. **BIG4** = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise.
2. **BOD_IND** = index of board effectiveness (WEF 2008).
3. **SEC_ENF**= enforcement of securities laws (WEF 2008).
4. **MIN_SH_RIGHT** = protection of minority shareholders interest (WEF 2008).
5. **ENF_ACC_AUD_STD** = enforcement of accounting & auditing standards (WEF 2008).
6. **JUD_IND** = index of judicial independence (WEF 2008).
7. **PRES_FREE** = Voice and accountability (World Bank 2006).

SIZE_{it} = natural logarithm of total assets in \$ thousands for firm i in year t,

LEV_{it} = total long-term debt/total assets for firm i in year t.

GROWTH_{it} = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t-1.

CFO_{it} = operating cash flows for firm i in year t scaled by lagged total assets.

CAPITALINTENSITY_{it} = Non-current (fixed) assets in year t / Total assets in year t.

LOSS_{it} = dummy variable, = 1 if firm i reports negative net income in year t.

fixed effects = country and year fixed effects,

e_{it} = error term.

$$\text{DACCR}_{it} = \beta_0 + \beta_1 \text{VOL_IFRS}_{it} + \beta_2 \text{INVPRO} + \beta_3 \text{VOL_IFRS}_{it} * \text{INVPRO}_{it} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{GROWTH}_{it} + \beta_7 \text{CFO}_{it} + \beta_8 \text{CAPITALINTENSITY}_{it} + \beta_9 \text{LOSS}_{it} + \text{fixed effects} + e_{it} \dots \dots \dots (5)$$

where,

VOL_IFRS_{it} = A dummy variable takes the value of 1 for a given country in the years after voluntary IFRS adoption and 0 otherwise.

The rest of the variables are defined as in equation (4), and the same coefficients (**β₁**, **β₂** and **β₃**) test the effects of investor protection environment and voluntary IFRS adoption on the earnings quality.

Control variables, which have been identified in the literature, have been included in addition to the explanatory variables. SIZE and LEV are included as control variables as Klein (2002) documents that discretionary accruals are negatively associated with SIZE and positively associated with LEV. Watts and Zimmerman (1990) posit that larger companies are more politically visible and thus would engage in earnings management to reduce the size of their accruals. Moreover, given that companies that are closer to breaking their debt covenants would be more willing to engage in earnings increasing accruals (Hagerman and Zmijewski 1979; Bowen et al

1981; Dhaliwal 1988; Watts and Zimmerman 1986; Bartov 2002; DeAngelo et al 1994; DeFond and Jiambalvo 1994; Sweeney 1994; and Francis and Wang 2008) we also predict a positive relationship between LEV and accruals.

Growth companies are expected to be more willing to engage in income increasing earnings management in order to increase the value of their shares, thus attracting more investors to meet their capital needs. We include cash flow from operations (CFO) deflated by lagged total assets because there is a well documented inverse relation between CFO and accruals (Francis and Wang 2008). A dummy variable is used for firms with losses (LOSS) as a proxy for financial distress and bankruptcy risk and therefore an incentive to increase reported earnings in the subsequent year.

Equation (4) is estimated as a fixed effects model with year-specific dummy variables to control for systematic time period effects and country dummies to provide additional controls for omitted variables that could affect firm-level accruals. For succinctness, the year and industry dummies are not reported in the tables.

We test equation (5), in order to determine if there is any difference in earnings quality resulting from voluntary adoption of IFRS as opposed to mandatory adoption.

4.2. Avoidance of Reporting Loss

Our second set of tests is based on avoidance of reporting loss as the measure of earnings quality. Recent research suggests that managers have strong incentives to avoid reporting earnings decreases and losses. (Francis and Wang 2008; Yu 2005; Burgstahler and Dichev 1997; Barth et al. 1999; De Angelo et al. 1996). There is a considerable literature that establishes the fact that managers in the US and in the UK manage earnings to meet or beat targets. This is understandable because stock prices

react to earnings surprises and hence managers have incentives to provide positive earnings surprises to the market. Further, the substantial stock options granted to US and UK managers exacerbate this behaviour because managers are thus more likely to inflate earnings numbers to boost stock prices, in order to make windfall gains by exercising their options. Another reason why managers tend to manage earnings relates to analyst's forecasts. The market tends to penalize firms heavily for missing earnings targets issued by analysts. Thus loss recognition is more likely to occur in countries with strong investor protection regimes because the consequences of hiding or under reporting losses will be more significant in these countries.

Equations (6) and (7) are employed to test if loss reporting (earnings quality) is affected by a country's investor protection environment and IFRS adoption (mandatory and voluntary), plus a set of control for other factors that may affect the avoidance of reporting losses, along with fixed effects for year and country.

$$P(\text{LOSS}_{it} = 1) = \beta_0 + \beta_1 \text{MAN_IFRS}_{it} + \beta_2 \text{INVPRO} + \beta_3 \text{MAN_IFRS}_{it} * \text{INVPRO} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{GROWTH}_{it} + \text{fixed effects} + e_{it} \dots \dots \dots (6)$$

and,

$$P(\text{LOSS}_{it} = 1) = \beta_0 + \beta_1 \text{VOL_IFRS}_{it} + \beta_2 \text{INVPRO} + \beta_3 \text{VOL_IFRS}_{it} * \text{INVPRO} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{GROWTH}_{it} + \text{fixed effects} + e_{it} \dots \dots \dots (7)$$

where,

LOSS_{it} = dummy variable, = 1 if firm i reports negative net income in year t.

The rest of the variables are defined as in equation (4), and the same coefficients (β_1 , β_2 and β_3) test the effects of investor protection environment and voluntary IFRS adoption on the avoidance of reporting losses.

4.3 Sample Selection

The financial statement data was extracted from the OSIRIS database for the period 1998-2007 and hand collected from annual reports for those variables not found on the OSIRIS database. Following prior research (Francis and Wang 2008, and Daske et al. 2008); we exclude financial services firms such as banks, insurance companies and other financial institutions because it is problematic to compute discretionary accruals for such entities. We also exclude utility companies because they are regulated and therefore are likely to differ from other companies in respect of incentives to manage earnings. We exclude observations where the statements were not audited or where there were missing values for the dependent and independent variables under study. Finally we exclude observations that fall in the top and bottom 1% of discretionary accruals, and those with the absolute value of Studentized residuals greater than 3 in the discretionary accruals analysis. The trimming procedure produces our sample which consists of 115,608 firms-years for the period 1998-2007 in the discretionary accruals analysis and loss avoidance analysis. The sample selection process is summarized in Table 2, and details of the two samples and variables used in each of the two tests are reported in Table 3.

[Insert Tables 2 and 3 here]

5. Empirical Results

5.1. Descriptive statistics

The descriptive statistics presented in Table 3 provide univariate information regarding both earnings quality and effect of investor protection and IFRS adoption. The mean (median) measure of discretionary accrual (DACCR) in this study is $-.1674$ ($-.1655$). The 25th percentile value of abnormal accruals is $-.2756$, and the 75th percentile value is $-.0451$. Managers of the sample companies engaged in larger

decreasing DACCR compared to income increasing DACCR in the choice of accounting policies as 81.38 percent of the companies had negative DACCR while the other 18.62 percent had positive DACCR.

[Insert Tables 4 and 5 here]

Not surprisingly, there is relatively high correlation among the seven investor protection variables reported in Tables 4 and 5. All pair-wise correlations are positive and statistically significant at ($p < .01$). The protection of minority shareholders rights has been widely used to measure investor protection in prior research. While viewed as a simplistic dichotomy, it is associated with other more specific measures of investor protection, with correlations ranging from .153 to .929 in Tables 4 & 5. In other words countries with strong minority shareholders protection also have strong investor protection through other means, in particular, corporate and securities law.

5.2. Discretionary Accrual Analysis

[Insert Tables 6 and 7 here]

The discretionary accruals analysis with mandatory IFRS adoption is reported in Table 6. Seven regression models are reported in which each investor protection variable is tested one at a time. All models have adjusted R-squares of around 42 percent; the significance levels of individual coefficients are reported as two-tail p-values.

Mandatory IFRS adoption is significantly but positively related to DACCR at $p < .01$ in all models except the model using board independence (which is significant at $p = .171$). This is similar to other studies involving IFRS adoption such as van Tendeloo and Vanstraelen (2005), and Lin and Paananen (2007). This result indicates

that mandatory adoption of IFRS alone has a negative impact on earnings quality as measured by discretionary accruals.

The investor protection variable by itself represents the effect on accruals as investor protection become stricter. The investor protection variable is significant and negatively related to DACCR at $p < .01$ in all seven models. The interaction of investor protection with the mandatory IFRS adoption variable measures the effect of adopting countries earnings quality relative to non-adopting countries as investor protection become stronger. The interaction term has a negative coefficient in all models and indicates discretionary accruals of IFRS adopting countries are consistently smaller (less income increasing) relative to the accruals of non-adopting countries investor protection regime become stronger. The coefficients are significant in all models except the BIG 4 auditor and board independence models. Therefore, overall, the evidence in Table 6 indicates that discretionary accruals are smaller (less income increasing) as a country's investor protection regime becomes stronger. However, this effect is mediated by the country's choice of adopting IFRS and it turns out that discretionary accruals are smaller only if the country adopts IFRS.

The discretionary accruals analysis with voluntary IFRS adoption is reported in Table 7. Seven regression models are reported in which each investor protection variable is tested one at a time. All models have adjusted R-squares of around 42 percent; the reported significance levels of individual coefficients are reported as two-tail p-values. Overall, the empirical results are similar to those reported for mandatory adoption of IFRS.

5.3. Avoidance of loss Analysis

[Insert Tables 8 and 9 here]

The avoidance of loss analysis is reported in Tables 8 and 9. Table 8 reports seven logistic regression models testing for each investor protection variable one at a time. All models have Pseudo R-squares of around 32 percent; the reported significance levels of individual coefficients are based on two-tail p-values for asymptotic z-statistics.

The investor protection variable is significant at $p < .01$ in all seven models but is positive. The mandatory adoption variable is significant in all cases other than the securities law enforcement model. However, the sign varies across the models. We thus conclude that there are no systematic differences in mandatory IFRS adoption and non-adopting countries when investor protection is effectively zero.

The interaction term for investor protection with mandatory IFRS adoption is significant and negative in all models. The negative sign indicates that mandatory IFRS adopting countries are more likely to report losses than country's with non-adopting IFRS as the investor protection regime becomes stronger.

Table 9 reports the logistic regression models for voluntary adoption of IFRS. The voluntary adoption variable is positive in all cases but otherwise the results are overall similar to those obtained for mandatory adoption of IFRS.

5.4. Robustness Tests

In order to assure that smaller countries with fewer observations do not drive the results, we re-estimate the models for the largest countries in the sample having 200 or more firm-year observations. The results are reported in Tables 10 to 13 and are similar to the results reported in Tables 6 to 9 both in terms of the sign and

statistical significance on the test variables of interest. We thus conclude that smaller countries do not drive the results.

We perform a test of the economic magnitude of discretionary accruals similar to that used by Francis and Wang (2008). To compute the economic magnitude of the impact of strong investor protection with IFRS adoption on operating income, we use the investor protection variable BIG4 to measure high and low levels of investor protection based on the BIG4 versus nonBIG4 distinction. The coefficient on the interaction of mandatory IFRS adoption (-.006 in Table 6) measures the average magnitude of discretionary accruals, scaled by beginning year total assets, for firms with a BIG4 auditor versus a non-BIG4 auditor in mandatory IFRS adopting countries. We use this coefficient to derive a percentage effect on median operating income, adjusting for median beginning year total assets. This calculation results in an average reduction of -5.47 percent in median operating income for a firm with BIG 4 auditor in IFRS adopting countries compared with non-BIG4 auditor.

The sub sample of firms with BIG 4 auditor is also used to compute the economic magnitude of the impact of strong investor protection with IFRS adoption on operating income. Following the same procedure discussed above, this calculation results in lower median operating income of -4.85 percent of firms with BIG4 auditors in IFRS adopting countries.

We also compute the impact of investor protection and IFRS adoption on the likelihood that firms report losses. To do this we calculate the expected probability of a loss based on median values of the variables in the model. This calculation results in a loss likelihood of 7.41 percent for a Big 4 client in an IFRS adopting countries country versus 20.56 percent for non-Big 4 clients in an IFRS adopting country. In the sub sample of firms with Big 4 auditors, the likelihood of reporting a loss decreases

from 11.78 percent in an IFRS adopting country to 8.34 percent in a non adopting country, a decrease of 3.44 percentage points.

In summary, our evidence indicates that in weaker investor protection settings firms appear to have greater discretion over discretionary accruals to manage earnings and losses; even if the country has adopted IFRS.

7. Conclusion

This study reinforces the findings of other cross-country studies that earnings are of relatively higher quality in countries with strong legal systems and investor protection regimes. For example, there is evidence of less earnings management (Francis and Wang 2008), greater value relevance (Hung 2000), and greater earnings conservatism (Ball et al. 2000) in countries with strong investor protection regime. However, our result suggests that IFRS adoption per se does not lead to increased earnings quality, at least based on the earnings attributes analysed in our study. Specifically, accounting earnings quality is greater as investor protection regimes become stronger, but only for IFRS adopting countries. This evidence shows that the effect of investor protection is mediated through the adoption of IFRS. In other words, the effect of investor protection seems to be an indirect one that works through the incentives on adoption of IFRS. These results are consistent with Luez et al. (2003); La Porta et al. (1998; 2000; 2002; 2006); Francis and Wang (2008), and Ball et al. (2003) who conclude that adopting high quality standards might be a necessary condition for acquiring high quality information, without being a sufficient one. The results highlight the importance of accounting enforcement in promoting earnings quality even given high quality standards.

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Table 1: Descriptions of variables

Variable	Measure	Description	Data Source
Dependent variable			
Earnings Quality	DACCR	Discretionary accruals (DACCR) for each firm is defined as the residual from the regression of total accruals (the difference between cash flow from operations (CFO) and Earnings before interest and tax (EBIT)) on three factors that explain non-discretionary accruals, the increase in revenue, the level of receivables and the level of depreciable fixed assets using the modified Jones model (Dechow et al 1995).	OSIRIS (2009)
Independent variables			
Investor protection			
Firm-level characteristic	Auditor Quality	Dummy variable with the value of 1 if the firm is audited by one of the BIG 4 auditors and otherwise 0.	OSIRIS (2009)
	Board Independence	Measure of corporate governance by investors and boards of directors in the country and ranges from 1 to 7, where 1 signifies management has little accountability and 7 signifies investors and boards exert strong supervision of management decisions.	World Economic Forum (2008)
	Securities law enforcement	Aggregate measure of regulation of securities exchanges in the respective country and ranges from 1 to 7, where 1 signifies not transparent, ineffective and subject to under	World Economic Forum (2008)

Country-level characteristics		influence from industry and government, and 7 signifies transparent, effective and independent from undue influence from industry and government.	
	Protection of minority shareholders right	Measures of minority shareholders interest protection and ranges from 1 to 7, where 1 signifies not protected by law and 7 signifies protected by law and actively enforced.	World Economic Forum (2008)
	Enforcement of accounting and auditing Standards	Measures enforcement of auditing and financial reporting standards regarding company financial performance and ranges from 1 to 7, where 1 signifies extremely weak and 7 signifies extremely strong.	World Economic Forum (2008)
	Judicial Independence	Assessment of the efficiency and integrity of the legal environment as it affects business. Ranges from 1 to 7; with lower scores at lower efficiency levels.	World Economic Forum (2008)
	Press freedom	Measures the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association and a free media.	World Bank (2006)
	Mandatory IFRS adoption	A dummy variable that takes the value of 1 for the years after mandatory IFRS adoption and 0 otherwise.	Deloitte IAS Plus Website (2008)
	Voluntary IFRS adoption	A dummy variable that takes the value of 1 for the years after voluntary IFRS adoption and 0 otherwise.	Deloitte IAS Plus Website (2008)
	SIZE	Log of firm total assets	OSIRIS (2009)

Control Variables	LEV	Total long-term debt/Total Assets	OSIRIS (2009)
	ROE	Net income / Total equity	OSIRIS (2009)
	CFO	Cash flow from operations	OSIRIS (2009)
	CAPITALINTENSITY	Non-current (fixed) assets/ Total assets	OSIRIS (2009)
	LOSS	Takes the value 1 if Net income for the period is negative and 0 otherwise.	OSIRIS (2009)

Table 2**Sample selection**

Observations with missing values on dependent and independent variables for 1998-2007:	505594
Less: Observations from countries not in the list of the WEF report (2008)	(46298)
Less: Missing values on dependent and independent variables	(292644)
Less: Financial Institution and energy sector	(20522)
Less: Top and bottom 1% of DACCR accruals	(17844)
Less: Observations with Studentized residuals >3	<u>(12678)</u>
Number of observations used in the tests	<u>115608</u>

Table 3**Descriptive Statistics**

Variables	Mean	Std. Dev.	25th Percentile	Median	75th Percentile
DACCR	-.1674	.24671	-.2756	-.1655	-.0451
SIZE	5.0947	.87530	4.4860	5.0729	5.6822
LEV	.4662	.97262	.0114	.1806	.5956
GROWTH	.0064	.59211	-.0089	.0754	.1621
CFO	.0346	.19479	-.0132	.0564	.1249
CAPITAL INTENSITY	.3377	.24747	.1311	.2868	.4986
LOSS	.30	.459	.00	.00	1.00

Note: **DACCR** is the signed discretionary accruals. **SIZE** = natural logarithm of total assets in \$ thousands for firm *i* in year *t*. **LEV** = total long-term debt/total assets for firm *i* in year *t*. **GROWTH** = sales growth rate, defined as the sales in year *t* minus sales in *t*-1 and scaled by sales in year *t*. **CFO** = operating cash flows for firm *i* in year *t* scaled by lagged total assets. **CAPITALINTENSITY** = Non-current (fixed) assets in year *t* / Total assets in year *t*. **LOSS** = dummy variable, = 1 if firm *i* reports negative net income in the current year and 0 otherwise.

Table 4

Pearson correlations of Investor Protection and Mandatory IFRS adoption

	BOD_IND	SEC_ENF	MIN_SH_PROT	ENF_ACC_AUD_STD	JUD_IND	PRES_FREE	MAN_IFRS
BIG4	.254	.153	.192	.223	.176	.277	.033
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
BOD_IND		.867	.905	.909	.741	.818	.184
		(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
SEC_ENF			.855	.870	.681	.793	.169
			(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
MIN_SH_PROT				.929	.754	.738	.177
				(<.01)	(<.01)	(<.01)	(<.01)
ENF_ACC_AUD_STD					.823	.802	.229
					(<.01)	(<.01)	(<.01)
JUD_IND						.654	.243
						(<.01)	(<.01)
PRES_FREE							.120
							(<.01)

Note: p-values are in parenthesis.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF**= enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006).

Table 5

Pearson correlations of Investor Protection and Voluntary IFRS adoption

	BOD_IND	SEC_ENF	MIN_SH_P ROT	ENF_ACC_ AUD_STD	JUD_IND	PRES_FREE	VOL_IFRS
BIG4	.254	.153	.192	.223	.176	.277	.019
	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
BOD_IND		.867	.905	.909	.741	.818	-.042
		(<.01)	(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
SEC_ENF			.855	.870	.681	.793	.018
			(<.01)	(<.01)	(<.01)	(<.01)	(<.01)
MIN_SH_PROT				.929	.754	.738	-.026
				(<.01)	(<.01)	(<.01)	(<.01)
ENF_ACC_AUD _STD					.823	.802	.003
					(<.01)	(<.01)	(<.01)
JUD_IND						.654	.033
						(<.01)	(<.01)
PRES_FREE							.026
							(<.01)

Note: p-values are in parenthesis.

BIG4 equals 1 if the firm audited by one of the **BIG 4** and otherwise 0. **BOD_IND** is the efficacy of corporate board's scores from World Economic Forum (2008). **SEC_ENF** is the regulations of securities exchange scores from World Economic Forum (2008). **MIN_SH_PROT** is the protection of minority shareholders interest scores from World Economic Forum (2008). **ENF_ACC_AUD_STD** is the enforcement of Accounting & Auditing Standards scores from World Economic Forum (2008). **JUD_IND** is the judicial independence scores from World Economic Forum (2008). **PRES_FREE** scores from The World Bank (2006).

Table 6
Regression Analysis of Discretionary Accruals with Mandatory IFRS adoption
(Dependent variable is signed discretionary accruals: DACCR)

$$DACCR_{it} = \beta_0 + \beta_1 MAN_IFRS_{it} + \beta_2 INVPRO + \beta_3 MAN_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 CFO_{it} + \beta_8 CAPITALINTENSITY_{it} + \beta_9 LOSS_{it} + \text{fixed effects} + e_{it}$$

	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIG HT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE
Independent variables	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	-0.331 (<0.01)	-0.192 (<0.01)	-0.302 (<0.01)	-0.249 (<0.01)	-0.246 (<0.01)	-0.280 (<0.01)	-0.317 (<0.01)
MAN_IFRS	.017 (<0.01)	.029 (.171)	.085 (<0.01)	.054 (<0.01)	.070 (<0.01)	.042 (<0.01)	.026 (<0.01)
INVPRO	-0.013 (<0.01)	-0.026 (<0.01)	-0.004 (<0.01)	-0.014 (<0.01)	-0.014 (<0.01)	-0.009 (<0.01)	-0.014 (<0.01)
MAN_IFRS* INVPRO	-0.006 (.086)	-0.001 (.699)	-0.012 (<0.01)	-0.006 (.033)	-0.008 (<0.01)	-0.004 (.051)	-0.008 (<0.01)
SIZE	.014 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.012 (<0.01)
LEV	.019 (<0.01)	.020 (<0.01)	.019 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)
GROWTH	.054 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.054 (<0.01)
CFO	-0.402 (<0.01)	-0.390 (<0.01)	-0.391 (<0.01)	-0.390 (<0.01)	-0.390 (<0.01)	-0.390 (<0.01)	-0.404 (<0.01)
CAPITALINTENSITY	.463 (<0.01)	.461 (<0.01)	.465 (<0.01)	.463 (<0.01)	.462 (<0.01)	.463 (<0.01)	.458 (<0.01)
LOSS	-0.140 (<0.01)	-0.137 (<0.01)	-0.140 (<0.01)	-0.138 (<0.01)	-0.138 (<0.01)	-0.140 (<0.01)	-0.137 (<0.01)
Adj. R²	.417	.418	.415	.416	.416	.416	.419
N	115608	115608	115608	115608	115608	115608	115608

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **DACCR** = discretionary accruals scaled by beginning year total assets. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **DACCR** is the signed discretionary accruals. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t. **CFO** = operating cash flows for firm i in year t scaled by lagged total assets. **CAPITALINTENSITY** = Non-current (fixed) assets in year t / Total assets in year t. **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise.

Table 7

Regression Analysis of Discretionary Accruals with Voluntary IFRS adoption
(Dependent variable is signed discretionary accruals: DACCR)

$$DACCR_{it} = \beta_0 + \beta_1VOL_IFRS_{it} + \beta_2INVPRO + \beta_3VOL_IFRS_{it}*INVPRO + \beta_4SIZE_{it} + \beta_5LEV_{it} + \beta_6GROWTH_{it} + \beta_7CFO_{it} + \beta_8CAPITALINTENSITY_{it} + \beta_9LOSS_{it} + fixed\ effects + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIG HT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FRE E
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	-0.330 (<0.01)	-0.202 (<0.01)	-0.305 (<0.01)	-0.254 (<0.01)	-0.256 (<0.01)	-0.286 (<0.01)	-0.316 (<0.01)
VOL_IFRS	.025 (<0.01)	.123 (.100)	.463 (.001)	.284 (.007)	.158 (.022)	.113 (.017)	.059 (<0.01)
INVPRO	-0.013 (<0.01)	-0.024 (<0.01)	-0.004 (<0.01)	-0.013 (<0.01)	-0.012 (<0.01)	-0.009 (<0.01)	-0.014 (<0.01)
VOL_IFRS* INVPRO	-0.010 (.196)	-0.027 (.065)	-0.084 (.001)	-0.058 (.005)	-0.029 (.016)	-0.021 (.012)	-0.022 (.001)
SIZE	.014 (<0.01)	.012 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.012 (<0.01)
LEV	.019 (<0.01)	.020 (<0.01)	.019 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)
GROWTH	.055 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.054 (<0.01)
CFO	-0.402 (<0.01)	-0.390 (<0.01)	-0.391 (<0.01)	-0.390 (<0.01)	-0.390 (<0.01)	-0.390 (<0.01)	-0.403 (<0.01)
CAPITALINT ENSITY	.462 (<0.01)	.459 (<0.01)	.464 (<0.01)	.461 (<0.01)	.461 (<0.01)	.461 (<0.01)	.458 (<0.01)
LOSS	-0.140 (<0.01)	-0.138 (<0.01)	-0.141 (<0.01)	-0.139 (<0.01)	-0.139 (<0.01)	-0.141 (<0.01)	-0.137 (<0.01)
Adj. R²	.417	.417	.415	.416	.416	.416	.419
N	115608	115608	115608	115608	115608	115608	115608

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_INDE** = index of board effectiveness (WEF 2008). **SEC_ENF**= enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **DACCR** = discretionary accruals scaled by beginning year total assets. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV**= total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t. **CFO** = operating cash flows for firm i in year t scaled by lagged total assets. **CAPITALINTENSITY**_{it} = Non-current (fixed) assets in year t / Total assets in year t. **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise.

Table 8

**Logistic Regression Analysis of Loss Avoidance with Mandatory IFRS adoption
(Dependent variable is the probability of reporting loss: P (Loss = 1))**

$$P(LOSS_{it} = 1) = \beta_0 + \beta_1 MAN_IFRS_{it} + \beta_2 INVPRO + \beta_3 MAN_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \text{fixed effects} + e_{it}$$

	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIGHT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE
Independent variables	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	2.200 (<0.01)	-.974 (<0.01)	.806 (<0.01)	-.226 (.032)	-.011 (.910)	1.887 (<0.01)	2.029 (<0.01)
MAN_IFRS	-.117 (<0.01)	1.447 (<0.01)	.180 (.602)	.869 (<0.01)	.806 (.030)	-.968 (<0.01)	-.285 (<0.01)
INVPRO	.149 (<0.01)	.594 (<0.01)	.228 (<0.01)	.427 (<0.01)	.371 (<0.01)	.040 (<0.01)	.357 (<0.01)
MAN_IFRS* INVPRO	-.216 (<0.01)	-.339 (<0.01)	-.090 (.130)	-.228 (<0.01)	-.207 (<0.01)	.118 (<0.01)	-.077 (.080)
SIZE	-.701 (<0.01)	-.665 (<0.01)	-.645 (<0.01)	-.638 (<0.01)	-.643 (<0.01)	.657 (<0.01)	-.698 (<0.01)
LEV	1.841 (<0.01)	1.657 (<0.01)	1.695 (<0.01)	1.590 (<0.01)	1.611 (<0.01)	1.761 (<0.01)	1.713 (<0.01)
GROWTH	-2.969 (<0.01)	-2.735 (<0.01)	-2.788 (<0.01)	-2.753 (<0.01)	-2.759 (<0.01)	-2.796 (<0.01)	-2.896 (<0.01)
Nagelkerke R Square	.314	.318	.310	.315	.315	.308	.308
N	115608	115608	115608	115608	115608	115608	115608

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. **MAN_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t.

Table 9

Logistic Regression Analysis of Loss Avoidance with Voluntary IFRS adoption
(Dependent variable is the probability of reporting loss: P (LOSS = 1))

$$P(LOSS_{it} = 1) = \beta_0 + \beta_1 VOL_IFRS_{it} + \beta_2 INVPRO + \beta_3 VOL_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \text{fixed effects} + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIGHT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE Freedom
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	2.182 (<0.01)	-.579 (<0.01)	.971 (<0.01)	.089 (.371)	.309 (.001)	1.924 (<0.01)	2.008 (<0.01)
VOL_IFRS	.177 (.075)	1.345 (<0.01)	2.634 (<0.01)	1.921 (<0.01)	1.232 (<0.01)	2.932 (<0.01)	.005 (.971)
INVPRO	.137 (<0.01)	.510 (<0.01)	.194 (<0.01)	.363 (<0.01)	.309 (<0.01)	.030 (<0.01)	.333 (<0.01)
VOL_IFRS* INVPRO	-.808 (<0.01)	-1.511 (<0.01)	-1.930 (<0.01)	-1.776 (<0.01)	-1.128 (<0.01)	-.596 (<0.01)	-.350 (<0.01)
SIZE	-.700 (<0.01)	-.664 (<0.01)	-.648 (<0.01)	-.641 (<0.01)	-.646 (<0.01)	.659 (<0.01)	-.696 (<0.01)
LEV	1.846 (<0.01)	1.697 (<0.01)	1.726 (<0.01)	1.638 (<0.01)	1.662 (<0.01)	1.781 (<0.01)	1.730 (<0.01)
GROWTH	-2.975 (<0.01)	-2.757 (<0.01)	-2.801 (<0.01)	-2.772 (<0.01)	-2.780 (<0.01)	-2.808 (<0.01)	-2.910 (<0.01)
Nagelkerke R Square	.314	.315	.309	.313	.312	.307	.322
N	115608	115608	115608	115608	115608	115608	115608

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t.

Robustness Test (Tables 10-13)

Table 10
Regression Analysis of Discretionary Accruals with Mandatory IFRS adoption (Large countries)
(Dependent variable is signed discretionary accruals: DACCR)

$$DACCR_{it} = \beta_0 + \beta_1 MAN_IFRS_{it} + \beta_2 INVPRO + \beta_3 MAN_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 CFO_{it} + \beta_8 CAPITALINTENSITY_{it} + \beta_9 LOSS_{it} + fixed\ effects + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RI GHT	Investor protection = ENF_ACC_A UD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	-.331 (<0.01)	-.192 (<0.01)	-.303 (<0.01)	-.250 (<0.01)	-.247 (<0.01)	-.280 (<0.01)	-.318 (<0.01)
MAN_IFRS	.017 (<0.01)	.036 (.100)	.089 (<0.01)	.059 (<0.01)	.078 (<0.01)	.051 (<0.01)	.027 (<0.01)
INVPRO	-.013 (<0.01)	-.026 (<0.01)	-.004 (<0.01)	-.014 (<0.01)	-.014 (<0.01)	-.009 (<0.01)	-.014 (<0.01)
MAN_IFRS* INVPRO	-.006 (.099)	-.003 (.496)	-.013 (<0.01)	-.007 (.016)	-.010 (<0.01)	-.005 (.010)	-.009 (<0.01)
SIZE	.014 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.012 (<0.01)
LEV	.019 (<0.01)	.020 (<0.01)	.019 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)
GROWTH	.054 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.054 (<0.01)
CFO	-.401 (<0.01)	-.388 (<0.01)	-.390 (<0.01)	-.389 (<0.01)	-.388 (<0.01)	-.389 (<0.01)	-.402 (<0.01)
CAPITALINTE NSITY	.463 (<0.01)	.461 (<0.01)	.465 (<0.01)	.463 (<0.01)	.462 (<0.01)	.463 (<0.01)	.458 (<0.01)
LOSS	-.140 (<0.01)	-.137 (<0.01)	-.140 (<0.01)	-.138 (<0.01)	-.138 (<0.01)	-.140 (<0.01)	-.137 (<0.01)
Adj. R²	.416	.417	.415	.416	.416	.416	.419

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on the year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **DACCR** = discretionary accruals scaled by beginning year total assets. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t. **CFO** = operating cash flows for firm i in year t scaled by lagged total assets. **CAPITALINTENSITY_{it}** = Non-current (fixed) assets in year t / Total assets in year t. **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise.

Table 11

Regression Analysis of Discretionary Accruals with Voluntary IFRS adoption (Large countries)

(Dependent variable is signed discretionary accruals: DACCR)

$$DACCR_{it} = \beta_0 + \beta_1 VOL_IFRS_{it} + \beta_2 INVPRO + \beta_3 VOL_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \beta_7 CFO_{it} + \beta_8 CAPITALINTENSITY_{it} + \beta_9 LOSS_{it} + \text{fixed effects} + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIGHT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	-.330 (<0.01)	-.203 (<0.01)	-.306 (<0.01)	-.254 (<0.01)	-.256 (<0.01)	-.286 (<0.01)	-.316 (<0.01)
VOL_IFRS	.044 (<0.01)	.124 (.098)	.465 (<0.01)	.285 (<0.01)	.159 (.021)	.113 (.018)	.060 (<0.01)
INVPRO	-.013 (<0.01)	-.024 (<0.01)	-.004 (<0.01)	-.013 (<0.01)	-.012 (<0.01)	-.008 (<0.01)	-.014 (<0.01)
VOL_IFRS* INVPRO	-.010 (.201)	-.028 (.063)	-.084 (<0.01)	-.058 (<0.01)	-.029 (.015)	-.021 (.012)	-.022 (<0.01)
SIZE	.014 (<0.01)	.012 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.011 (<0.01)	.012 (<0.01)
LEV	.019 (<0.01)	.020 (<0.01)	.019 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)	.020 (<0.01)
GROWTH	.054 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.053 (<0.01)	.054 (<0.01)
CFO	-.401 (<0.01)	-.388 (<0.01)	-.390 (<0.01)	-.388 (<0.01)	-.388 (<0.01)	-.389 (<0.01)	-.402 (<0.01)
CAPITALINTENSITY	.462 (<0.01)	.459 (<0.01)	.464 (<0.01)	.461 (<0.01)	.461 (<0.01)	.461 (<0.01)	.457 (<0.01)
LOSS	-.140 (<0.01)	-.138 (<0.01)	-.141 (<0.01)	-.139 (<0.01)	-.139 (<0.01)	-.141 (<0.01)	-.137 (<0.01)
Adj. R²	.416	.417	.414	.415	.415	.415	.418

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_IND** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **DACCR** = discretionary accruals scaled by beginning year total assets. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t. **CFO** = operating cash flows for firm i in year t scaled by lagged total assets. **CAPITALINTENSITY_{it}** = Non-current (fixed) assets in year t / Total assets in year t. **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise.

Table 12

Logistic Regression Analysis of Loss Avoidance with Mandatory IFRS adoption (Large countries)

(Dependent variable is the probability of reporting loss: P (LOSS = 1))

$$P(LOSS_{it} = 1) = \beta_0 + \beta_1 MAN_IFRS_{it} + \beta_2 INVPRO + \beta_3 MAN_IFRS_{it} * INVPRO + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GROWTH_{it} + \text{fixed effects} + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIGHT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	2.348 (<0.01)	-.961 (<0.01)	.824 (<0.01)	-.214 (.044)	-.006 (.951)	1.885 (<0.01)	2.030 (<0.01)
MAN_IFRS	-.116 (.007)	1.578 (<0.01)	.316 (.367)	.951 (.002)	.910 (.016)	-.979 (<0.01)	-.271 (<0.01)
INVPRO	.148 (<0.01)	.591 (<0.01)	.225 (<0.01)	.425 (<0.01)	.370 (<0.01)	.041 (<0.01)	.355 (<0.01)
MAN_IFRS* INVPRO	-.210 (<0.01)	-.362 (<0.01)	-.113 (.062)	-.242 (<0.01)	-.223 (.001)	.120 (.002)	-.087 (.052)
SIZE	-.700 (<0.01)	-.665 (<0.01)	-.645 (<0.01)	-.637 (<0.01)	-.643 (<0.01)	.657 (<0.01)	-.698 (<0.01)
LEV	1.841 (<0.01)	1.657 (<0.01)	1.695 (<0.01)	1.590 (<0.01)	1.611 (<0.01)	1.760 (<0.01)	1.715 (<0.01)
GROWTH	-2.963 (<0.01)	-2.730 (<0.01)	-2.782 (<0.01)	-2.748 (<0.01)	-2.753 (<0.01)	-2.790 (<0.01)	-2.892 (<0.01)
Nagelkerke R Square	.314	.317	.310	.315	.314	.314	.323

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_INDE** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. **MAN_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t.

Table 13

Logistic Regression Analysis of Loss Avoidance with Voluntary IFRS adoption (Large countries)
(Dependent variable is the probability of reporting loss: P (LOSS = 1))

$$P(\text{LOSS}_{it} = 1) = \beta_0 + \beta_1 \text{VOL_IFRS}_{it} + \beta_2 \text{INVPRO} + \beta_3 \text{VOL_IFRS}_{it} * \text{INVPRO} + \beta_4 \text{SIZE}_{it} + \beta_5 \text{LEV}_{it} + \beta_6 \text{GROWTH}_{it} + \text{fixed effects} + e_{it}$$

Independent variables	Investor protection = BIG4	Investor protection = BOD_INDE	Investor protection = SEC_ENF	Investor protection = MIN_SH_RIGHT	Investor protection = ENF_ACC_AUD_STD	Investor protection = JUD_IND	Investor protection = PRES_FREE Freedom
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
Constant	2.319 (<0.01)	-.557 (<0.01)	.996 (<0.01)	.108 (.279)	.318 (.001)	1.925 (<0.01)	2.008 (<0.01)
VOL_IFRS	.174 (.079)	1.345 (<0.01)	2.795 (<0.01)	1.920 (<0.01)	1.232 (<0.01)	2.928 (<0.01)	.001 (.995)
INVPRO	-137 (<0.01)	.506 (<0.01)	.190 (<0.01)	.360 (<0.01)	.307 (<0.01)	.030 (.002)	.330 (<0.01)
VOL_IFRS* INVPRO	-.808 (<0.01)	-1.506 (<0.01)	-1.925 (<0.01)	-1.772 (<0.01)	-1.126 (<0.01)	-.596 (<0.01)	-.347 (.004)
SIZE	-.699 (<0.01)	-.664 (<0.01)	-.647 (<0.01)	-.641 (<0.01)	-.646 (<0.01)	.658 (<0.01)	-.696 (<0.01)
LEV	1.845 (<0.01)	1.697 (<0.01)	1.726 (<0.01)	1.639 (<0.01)	1.662 (<0.01)	1.780 (<0.01)	1.731 (<0.01)
GROWTH	-2.969 (<0.01)	-2.752 (<0.01)	-2.795 (<0.01)	-2.767 (<0.01)	-2.773 (<0.01)	-2.802 (<0.01)	-2.906 (<0.01)
Negelkerke R Square	.314	.315	.309	.313	.312	.307	.322

Note: Coefficient p-values are two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993). For clarity in presentation the coefficients on year and country dummies have not been reported.

BIG4 = dummy variable, = 1 if firm i is audited by a BIG4 auditor in year t, 0 otherwise. **BOD_INDE** = index of board effectiveness (WEF 2008). **SEC_ENF** = enforcement of securities laws index (WEF 2008). **MIN_SH_RIGHT** = protection of minority shareholders interest index (WEF 2008). **ENF_ACC_AUD_STD** = Enforcement of accounting & auditing standards (WEF 2008). **JUD_IND** = index of Judicial independence (WEF 2008). **PRES_FREE** = Voice and accountability index (The World Bank 2006). **LOSS** = dummy variable, = 1 if firm i reports negative net income in the current year and 0 otherwise. **VOL_IFRS** = A dummy variable takes the value of 1 for a given country in years after voluntary IFRS adoption and 0 otherwise. **SIZE** = natural logarithm of total assets in \$ thousands for firm i in year t. **LEV** = total long-term debt/total assets for firm i in year t. **GROWTH** = sales growth rate, defined as the sales in year t minus sales in t-1 and scaled by sales in year t.