

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

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

Abstract

This study examines the effects of mandatory IFRS adoption and investor protection on the quality of accounting earnings in forty-six countries (around the globe). The results suggest that earnings quality increases for mandatory IFRS adoption when a country's investor protection regime provides stronger protection. This study extends the current literature that shows that accounting practices are influenced by country level macro settings. The results highlight the importance of investor protection for financial reporting quality and the need for regulators to design mechanisms that limit managers' earnings management practices.

Key words: *earnings quality, discretionary accruals, accruals quality, earnings persistence, micro governance, and macro governance.*

JEL classification: J3; K2; M4.

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1. Introduction

The FASB/IASB Conceptual Framework identifies relevance and representational faithfulness as the fundamental qualitative characteristics that determine the usefulness of accounting information when making economic decisions. Accounting earnings information is relevant if it is capable of making a difference in users' decision making, that is, if it has predictive or confirmatory value, or both. This information can be a perfectly faithful representation if it is complete, neutral and free from error. (FASB/IASB 2010: Chapter 3). 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). A further likely important determinant (of the quality of accounting information) is the adoption of International Financial Reporting Standards (IFRS), issued by the International Accounting Standards Board (IASB). More than 134 countries currently permit or require IFRS, including the EU countries, Australia, New Zealand, and many developing countries. Since the adoption of, or announcement of a decision to adopt IFRS, national accountings differences have decreased and the present international accounting setting thus provides an opportunity to examine further why there are differences in earning quality.

This paper makes several contributions to the current literature. Using a large sample of firm year observations from 46 countries, for the years 1998 - 2007, our results suggest that earnings quality increases for mandatory IFRS adoption where a country's investor protection regime offers stronger protection for its investors. These findings are consistent with the argument that cross-country differences in accounting quality are likely to remain

after mandatory IFRS adoption where there is poor investor protection (Soderstrom and Sun 2007; Sunder 1997; Daske et al. 2008; Jamal et al. 2009). International studies on earnings quality tend to focus on developed economies and on just a limited number of countries. This study uses a large sample of firms in both developed and emerging economies and thus offers the potential for better understanding of the global impact of IFRS adoption. Finally, the study also examines the effects of mandatory IFRS adoption and investor protection on the quality of accounting earnings at firm level. This allows for variation, not only across countries, but also across firms within countries.

In Section 2 we set out the theoretical framework for the study and develop the hypotheses. In Section 3 we describe the measures of investor protection that we use in the study. In Section 4 we discuss the research design and sample selection. In Section 5 we present our results and in Section 6 our conclusions.

2. Theoretical Framework and hypothesis development

Improvement of accounting earnings quality depends on at least two factors: high quality accounting standards and a country's overall investor protection (Soderstrom and Sun, 2007). This was noted by Ewert and Wagenhofer (2005) who observed that high quality accounting standards reduced earnings management and improved reporting quality. Barth et al. (2006) suggested that firms that adopted IFRS were less prone to engage in earnings smoothing and were more likely to recognize losses in an appropriate manner. Similar findings were reported by Jennings et al. (2004) and again by Armstrong et al. (2010). Schipper (2005) argued that the adoption of IFRS in the European Union (EU) provided a more powerful setting in which to test the determinants and economic consequences of accounting quality because accounting standards across EU countries were consistent.

Ball (2001) argued that IFRSs provided high quality accounting information in a public financial reporting and disclosure system characterized by (i) training of the audit profession in adequate numbers, and high professional ability, (ii) independence from managers to certify reliably the quality of financial statements, (iii) separation, as far as possible, of public financial reporting and corporate income taxation, so that tax objectives did not distort financial information, (iv) reform of the structure of corporate ownership and governance to achieve an open-market process for reliable public information, (v) establishment of a system for setting and maintaining high-quality, independent accounting standards, and (vi) perhaps most important of all, the establishment of an effective independent legal system for detecting and penalizing fraud, manipulation, and failure to comply with standards accounting and other required disclosure, including provision for private litigation by stockholders and lenders adversely affected by deficient financial reporting and disclosures. Biddle and Hillary (2006) found that high quality accounting information reduced the investment-cash flow sensitivity in market-based economies (strong investor protection) but not in bank-based or creditor-dominated economies.

Contrary to the above studies, van Tendeloo and Vanstraelen (2005), and Lin and Paananen (2007) examined the discretionary accruals of German firms adopting IFRS. They found that IFRS firms had more discretionary accruals, and that there was a low correlation between accruals and cash flows. Similarly Paananen, (2008) investigated whether the quality of financial reporting in Sweden increased after the adoption of IFRS and found that the quality of financial reporting (measured by the degree of smoothing of earnings) decreased after the adoption of IFRS. Platikanova and Nobes (2006) compared the information asymmetry component of the bid-ask spread among companies before and after the EU's adoption of IFRS in 2005. They found a larger volatility in the information asymmetry component for UK and German companies. They also found that companies from countries

where earnings management was more common exhibited a *lower* information asymmetry component compared to other countries. They interpreted this result as indicating that income smoothing reduced information asymmetry.

Although the results are mixed we posit the hypothesis,

Hypothesis 1: Earnings quality is positively associated with IFRS adoption.

Besides accounting standards, accounting earnings quality is influenced by firm- and country-level investor protection rather than accounting standards (Leuz *et al.*, 2003). Leuz *et al.* (2003) examined the relationship between investor protection and earnings management across 31 countries using non-financial industry data. They found that strong investor protection at a country level reduced the earnings management activities of firms and thus led to higher accounting quality. Following the above studies, Shen and Chih (2005) used 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 showed that accounting disclosure (proxied by strong legal enforcement) more effectively explained variations in earnings management across countries. Similarly, earlier research indicated that in countries with strong investor protection regimes there was greater financial transparency (Bhattacharya *et al.* 2003; Bushman *et al.* 2004), and less earnings management - all of which could be interpreted as evidence of higher accounting quality (Ball *et al.* 2000; Hung 2000; La Porta *et al.* 1998, 2000, 2006; and Daske *et al.* 2008). Ball *et al.* (2003) argued that adopting high quality standards was a necessary condition for acquiring high quality information, without being a sufficient one, that is, country level investor protection.

Bushman and Smith (2001) suggest that strong country level investor protection gives rise to high quality accounting information, and that the interaction of these two variables positively affects economic growth. Similarly, Leuz *et al.* (2003) found that firms in countries with developed equity markets, dispersed ownership, strong investor rights, and legal

enforcement engaged in less earnings management (Burgstahler et al. (2007)). Guenther and Young (2000) argued that in countries with strong investor protection there was a strong relationship between accounting earnings and actual economic events.

This leads to the following hypothesis:

Hypothesis 2: Earnings quality is positively associated with investor protection.

Daske et al. (2008) concluded that “investigating the joint effect of investor protection and IFRS adoption was an interesting avenue for future research” (p1132). The present international accounting setting provides an opportunity to address the impact of international governance arrangements - corporate, political, judicial and regulatory - on earnings quality. This paper argues that earnings quality is a joint function of investor protection and the quality of accounting standards, as proxied by IFRS. This view is based on the argument that accounting does not exist in a vacuum; that it is rather ‘a product of its environment’ (for example, Mueller 1968; Nobes 1988 and 1992; Karim 1995; Armstrong et al. 2010). In summary, lower investor protection breeds managerial discretion within the organization which impedes production of high quality accounting numbers, - despite high quality accounting standards. Accounting corruption is likely to accompany socio-political corruption. Clean and reliable financial information remains elusive in a low investor protection environment.

The final research hypothesis is thus as follows:

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

3. Investor protection variable

Economic theory suggests that a strong institutional setting develops in order to alleviate information and transaction costs. Much empirical work has tackled issues related to the importance of institutions and their impact on economic activity. Legal institutions that

safeguard the interests of investors are 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.

We test the effect of investor protection by a number of different measures as investor protection can be strengthened in a variety of ways. That is, investor protection has multiple dimensions. In cross-country research it has become common to test the effect of investor protection by multiple measures not only because it is multidimensional but also because the measures employed tend to be assessed with error and thus consistency of results across the measures, if achieved, provides greater confidence on the role of investor protection.

We use six country level measures of investor protection: board independence, enforcement of securities laws, protection of minority shareholder rights, enforcement of accounting and auditing standards, judicial independence, and freedom of the press. When considering investor protection, researchers have relied primarily on the legal protection database compiled by La Porta et al. (1997 and 1998). However, Spamann (2010) has raised concerns with the construction of one of the most routinely used investor protection measures, 'The Antidirector Right Index' (ADRI)¹. Following a consistent coding process, he found few significant differences between common law and code law countries with respect to ADRI values. Moreover, Kaufmann et al. (2007) reported that there were substantial changes in governance structure during the period 1996-2007². For this reason we have used the recent Kaufman et al. (2007) data for the freedom of the press measure and the World Economic Forum (2008) data for our other measures of investor protection. The World Economic Forum measures are coded on a scale from 1 to 7 with, for example a value of 1 for board effectiveness indicating that management has little independence, and 7 indicating

¹ We conduct robustness tests on the anti-director right index by La Porta et al., (1998) and revised and updated La Porta et al., (1998) ADRI from Pagano and Volpin (2005), which has also been used in earlier studies (Li et al., 2006). We obtained basically the same results (not reported)

² The results in Table 5 are robust to using year specific World Bank scores (2006) as a proxy for investor protection. We obtained basically the same results (not reported)

that board's display strong independence. Finally, for the press freedom measures are coded on a scale from -1.5884 to 1.6319, with higher scores indicating freedom of association and a free media and *vice-versa*. The measures are described in Table 1.

Boards play an important role both as independent scrutinizers of management action, and as protectors of shareholder wealth. The literature on governance emphasises the role played by independent boards in reducing agency problems arising from the divergent interests of the shareholders and the management of the company through monitoring of managerial behaviour (Peasnell et al. 2005). In Fama (1980) argued that independent directors had an incentive to protect shareholders' wealth in order to protect the value of their reputational capital. Peasnell et al. (2005) and Ebrahim (2007) found that companies with a high proportion of independent directors on the board tended to have lower abnormal accruals. Liu and Lu (2002) found that the earnings management endeavors of managers in China were constrained to a certain extent if boards were dominated by outside directors and the shares traded by foreign investors.

Enforcement of securities laws may prevent insiders from manipulating accounting numbers in order to profit from trading company's shares (Hope 2003). Beneish and Vargus (2002) provided evidence that insider trading was related with earnings management (cited from Cai et al. 2008).

From Hung (2000), Ball et al. (2000), Leuz et al. (2003), Daske et al. (2008), La Porta et al. (1998, 2000 and 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. La Porta et al. (1998) argued that country level strong investor protection improved the rights of outside (minority) investors and reduced agency problems between insiders (controlling) owners and outsiders/minority. When minority shareholders have greater legal protection against

opportunistic behaviour by majority shareholders, managers have incentives for a higher standard of care in order to avoid civil or criminal liability, and other punishment and sanctions imposed by regulatory agencies.

Sunder 1997 argued that enforcement of IFRS put pressure on management and auditors who thus had less scope to exercise discretion (FEE 2002, 29). Yu (2005) found that IAS, accrual-based accounting standards, accounting standards with increased disclosure requirements, and the separation of tax and financial reporting all constrained earnings management. He also suggested that high quality accounting standards decreased analyst forecast error. Francis et al. (2003) found no evidence that better accounting practice, independent of a country's underlying legal systems, was positively related to financial market development. Hope (2003) developed a broad measure of accounting standards enforcement and suggested that strong investor protection promotes managers to follow the rules.

Judicial independence measures the "efficiency and integrity of the legal environment as it affects business" (La Porta et al. 1998 and 2006; Francis and Wang 2008). However, it is difficult, to envisage of a situation in which the judicial system in general works poorly but enforcement of accounting regulation is strong.

Finally, freedom of the press indicates the extent to which a country's citizens participate in selecting their government. Other indicators include freedom of expression, freedom of association and a free media. Even prior to the recent financial collapses, free media was viewed as one of the main obstacles facing post-communist countries attempting to introduce democratic institutions and open market economies (Shleifer and Vishny 1997).

4. Research Design and Sample selection

4.1 Discretionary Accrual Analysis

We follow a number of studies on earnings quality that have used signed discretionary accruals as the (inverse) measure of earnings quality (Francis and Wang 2008). Thus, if a particular factor was negatively related to discretionary accruals we have interpreted that factor as contributing to an increase in earnings quality. Our methodology for testing the impact of IFRS adoption and the degree of investor protection closely follows that employed by Francis and Wang (2008).

Francis and Wang (2008) noted two reasons for using signed discretionary accruals rather than absolute discretionary accruals. Firstly, the main interest is in the use of managerial discretion to increase reported earnings because the adoption of IFRS was probably targeted at overstatement of earnings rather than understatement. Secondly, Hribar and Nichols (2006) reported empirical evidence suggesting that signed discretionary accruals were a better measure of earnings quality than absolute discretionary accruals.

A cross-sectional Jones (1991) model was not suitable for the calculation of discretionary accruals in a cross-country study, as the number of industry observations per country was likely to be quite small (Francis and Wang 2008; Wysocki 2004; Meuwissen et al. 2005). To avoid this problem, we followed Francis and Wang (2008) and applied the linear expectation model adapted from DeFond and Park (2001) which uses a firm's own prior year accruals in calculating the benchmark. Using financial data from the OSIRIS database, nondiscretionary accruals are calculated as:

$$\text{Nondiscretionary accruals} = \{[\text{sales in year } t * (\text{current accruals in year } t-1 / \text{sales in year } t-1)] + [\text{gross PPE in year } t * (\text{depreciation in year } t-1 / \text{gross PPE in year } t-1)]\} / \text{total assets in year } t-1.$$

where

$$\text{Current accruals} = \Delta [\text{total current assets} - \text{cash and cash equivalents} - \text{treasury stock shown as current assets}] - \Delta [\text{total current liabilities} - \text{total amount of debt in current liabilities} - \text{proposed dividends}]$$

Discretionary accruals are then calculated as the firm's actual total accruals in year t , minus nondiscretionary accruals for year t where total accruals are calculated as the difference between operating income and cash flow from operations, scaled by lagged total assets.

The model in the regression equation (1) below tests, whether the quality of earnings is a function of mandatory IFRS adoption, the country's investor protection, and the interaction of these two variables. In addition we include a set of firm-specific controls for other factors that may affect discretionary accruals³. Quality of earnings is measured by discretionary accruals and investor protection by our six alternative measures discussed above.

$$\mathbf{DACCR}_{it} = \beta_0 + \beta_1\mathbf{IFRS} + \beta_2\mathbf{INV} + \beta_3\mathbf{IFRS*INV} + \beta_4\mathbf{SIZE}_{it} + \beta_5\mathbf{LEV}_{it} + \beta_6\mathbf{GWTH}_{it} + \beta_7\mathbf{CFO}_{it} + \beta_8\mathbf{\Delta PE}_{it} + \beta_9\mathbf{LAGLOSS}_{it} + \text{fixed effects} \dots \dots \dots (1)$$

where,

\mathbf{DACCR}_{it} = discretionary accruals scaled by lagged total assets for firm i in year t

\mathbf{IFRS} = dummy variable that takes the value of 1 for a given country in the years after mandatory IFRS adoption and 0 otherwise

\mathbf{INV} = Investor protection measured six ways:

- (i) \mathbf{BOIND} = board independence (WEF 2008)
- (ii) \mathbf{SEC} = enforcement of securities laws (WEF 2008)
- (iii) \mathbf{MIN} = protection of minority shareholders' interest (WEF 2008)
- (iv) \mathbf{ACC} = enforcement of accounting & auditing standards (WEF 2008)
- (v) \mathbf{JUD} = judicial independence (WEF 2008)
- (vi) \mathbf{PRESS} = freedom of the press (Kaufman et al. 2007)

| \mathbf{SIZE}_{it} = natural logarithm of total assets in \$ thousands for firm i in year t

\mathbf{LEV}_{it} = total long-term debt/ total assets for firm i in year t

³ This is standard in the literature that uses both country-and firm-level variables (see Francis and Wang 2008). Moreover, the literature provides convincing evidence that country level variables have explanatory power across different time periods, suggesting that country level values change only slowly over time.

$GWTH_{it}$	= sales growth rate, defined as the sales in year t minus sales in year $t-1$ and scaled by sales in year $t-1$
CFO_{it}	= operating cash flows for firm i in year t scaled by lagged total assets
ΔPPE_{it}	= growth rate of PPE, defined as the gross PPE in year t minus gross PPE in year $t-1$ and scaled by gross PPE in year $t-1$
$LAGLOSS_{it}$	= dummy variable equals 1 if firm i reports negative income before extraordinary items in year $t-1$
fixed effects	= industry and year fixed effects

Table 1 below gives a full description of all the variables:

[Insert Table 1 here]

While the focus of this study is on country level factors in the determination of reporting practice, firm specific factors⁴ also contribute to the result. Thus control variables, identified in the literature, have been included with the explanatory variables. The variables SIZE and LEV are included as Klein (2002) documented that discretionary accruals were negatively associated with SIZE and positively associated with LEV. Watts and Zimmerman (1990) posited that larger companies were more politically visible and engaged in earnings management in order to reduce the size of their accruals. Moreover, given that companies that are closer to breaking their debt covenants were 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 and Gilson 1994; DeFond and Jiambalvo 1994; Sweeney 1994; and Francis and Wang 2008) we expected a positive relationship between LEV and accruals.

Growth companies are generally more willing to engage in income increasing earnings management in order to increase the value of their shares, and, therefore, attract more investors to meet their capital needs. The growth in sales and gross PPE, which could

⁴ All variables, excepts for dichotomous variables are translated at the 31 December (financial year) exchange rate for the US dollar. So the variables are based on a common unit of currency.

also affect yearly discretionary accruals if the relation between non-discretionary accruals and its drivers is nonlinear. We have included 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 (LAGLOSS) as a proxy for financial distress and bankruptcy risk and, therefore, have an incentive to increase reported earnings in the subsequent year.

Equation (1) is estimated as a fixed effects model with year-specific dummy variables to control for systematic time period and industry effects. For conciseness, the year and industry dummies are not reported in the table of results.

4.2 Sample Selection

The financial statement data was extracted from the OSIRIS database for the period 1998-2007. Following prior research (Francis and Wang 2008, and Daske et al. 2008), we excluded 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 excluded utility companies because they are regulated and are likely, therefore, to differ from other companies in respect of incentives to manage earnings. We have excluded observations where (i) there were missing values for the variables included in the study, (ii) any of the variables fell in the top and bottom 1% of the range of the variables, and (iii) those with the absolute value of studentized residuals greater than 3 in the estimation of discretionary accruals. The trimming procedure resulted in a sample of 104,348 firm year observations for the period 2000-2007⁵. The sample selection process is summarized in Panel A of Table 2.

[Insert Panel A Table 2 here]

⁵ To compute discretionary accruals, a company must have observations for at least three consecutive years, so 2000 is the first test year.

Panel B of Table 2 shows the sample distribution by year and country. Five countries have less than 200 firm year observations, Twenty three countries have from 200 to 1000 firm-year observations, and 18 countries have more than 1000 firm-year observations. Panel C of Table 2 reports the sample firm year observations with their industry classification. The sample consists of eight broad industries in terms of Global Industry Classification Standard (GISC). From Panel C of Table 2 it can be seen that for example the largest portion comes from “Materials” (23.16%), followed by “Industrials” (19.65%) and “Consumer Discretionary” (18.16%).

[Insert Panel B Table 2 here]

5. Empirical Results

5.1. Descriptive statistics

[Insert Panel A Table 3 here]

Descriptive statistics on the variables used in each of the tests are presented in Panel A of Table 3. The mean (median) of discretionary accruals (DACCR) scaled by lagged total assets is -0.012 (-0.011). The 25th percentile value of discretionary accruals is -0.068, and the 75th percentile value is -0.049. In the sample, 54 percent of the companies had positive DACCR while the other 46 percent had negative DACCR. Firm size (SIZE), as measured by the natural log of total assets, shows considerable variation with a mean of 5.109 but standard deviation of 0.885. The leverage (LEV) ratio is 47.30 percent, sales growth (GWTH) is 11.60 percent, cash flow from operations (CFO) is 5.40 percent, growth rate of gross PPE (Δ PPE) is 13.60 percent, and lag loss (LAGLOSS) is 29.60 percent. These values are consistent with previous studies such as Francis and Wang (2008) and Hope et al. (2008).

[Insert Panel B Table3 here]

Country-level variables are presented in Panel B of Table 3. Sweden (6.09), followed by UK (5.92), Australia (5.81) and South Africa (5.73) have strong board independence. On the other hand, Pakistan (3.57), China (4.01), and Poland (4.13) have the weak board independence. In terms of enforcement of securities laws variable (SEC), Sweden (6.26), Australia (6.22), and Hong Kong (6.19) have the highest scores. Sweden (6.26), Germany (6.14), South Africa (6.02), and Australia (5.86) have the strongest protection of minority shareholders interest, whereas Russia (3.14), Argentina (3.58), China (3.61) have the weakest protection of minority shareholders interest. For the enforcement of accounting and auditing standards variable (ACC), Sweden (6.32), UK (6.29), Australia (6.24), and South Africa (6.22) have the highest scores. Germany (6.53), Finland (6.43), Australia (6.40), and Thailand (6.30) have the highest scores on the judicial independence variable (JUD), whereas Venezuela (1.19), Argentina (2.17), and Peru (2.19) have the lowest scores. Finally, for the freedom of the press variables (PRESS), Finland (1.6319), Netherlands (1.6082), and Norway (1.5790) have the highest scores, where as China (-1.5884), Viet Nam (-1.5813), and Saudi Arabia (-1.5268) have the lowest scores.

[Insert Table 4 here]

Not surprisingly, the Pearson pair wise correlations among the six investor protection variables are relatively high. Table 4, below, shows that the correlations are all positive and range from 0.580 to 0.889 and, except for two cases, are all are significant at ($p < 0.01$). For this reason, the variables are included one at a time in the regressions. 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 strongly associated with other more specific measures of investor protection. That is, countries with strong minority shareholders

protection also have strong investor protection through other means, in particular, corporate and securities laws.

5.2. Main Results

The results of the regression analyses are reported in Table 5 with the significance levels of individual coefficients reported as two-tail p -values. Six models are reported which include IFRS adoption and, in turn, each of the investor protection variables. The regressions were estimated by OLS and use Rogers (1993) to derive t -statistics and p -values that are robust to heteroscedasticity as well as country clustering effects and the common variance among observations within each of the countries.

[Insert Table 5 here]

The coefficients on IFRS adoption and investor protection in all models are not significant. However, the coefficient on the interaction of IFRS adoption and investor protection, which measures the marginal impact of IFRS adoption on earnings quality as investor protection increases, is negative and significant at ($p \leq 0.05$) in all models (including at ($p < 0.01$) in five of the models). The firm specific control variables have expected sign and all models have adjusted R-squares of approximately 36 percent. The conjunction of these results indicates that

- (i) IFRS adoption in an environment of weak investor protection does not improve earnings quality;
- (ii) Increasing the degree of investor protection without adoption of IFRS does not improve earnings quality; and
- (iii) IFRS adoption improves earnings quality as investor protection is strengthened.

This overall result is at variance with the earlier studies that show either a positive or negative unconditional impact of IFRS adoption. Our results suggest that earnings quality increases with mandatory IFRS adoption when a country's investor protection regime provides stronger protection.

5.3. Robustness Tests⁶

To mitigate concern that the uneven country representation in our sample might bias the results towards countries that are more heavily represented, we examined the sensitivity of our results by excluding several countries with very high numbers of observations. Our results (not reported) are robust enough to exclude these countries from the regressions.

In order to ensure that smaller countries with few observations do not drive the results, we re-estimated the model for just the countries in the sample with at least 200 or more firm year observations. The results (not reported) are similar to the results reported in Table 5 in terms of the sign and statistical significance on the test variables of interest. We thus conclude that the countries with the smallest number of firm year observations do not drive the results.

Given the simultaneous adoption of IFRS by all EU countries from 2005, it is possible that these countries might drive the results. If so, their deletion from the data set should result in loss of significance for the coefficient on the IFRS adoption and investor protection interaction variable. Our results from a re-estimation of the model (not reported) were consistent with those reported in Table 5. The results, therefore, demonstrate that the EU is not an outlier with respect to the role of strong investor protection on the earnings quality of IFRS adopting countries.

As discussed above, we have derived our investor protection measures mainly from the World Economic Forum (2008) and The World Bank (2009). As an alternative to using

⁶ These results are available from the authors upon request.

the resulting raw composite measure of these scores, we repeat our analyses using the ranks of investor protection scores. For example, is the difference between a score of 7 and 1 twice as great as the difference between 4 and 1? To test this we re-estimated the models using ranks rather than raw scores. We obtained basically the same results (not reported).

We also re-estimated the models using auto regressive regression instead of OLS. The results (not reported) are similar to those reported in Table 5 in terms of the sign and statistical significance on the test variables of interest. We thus conclude that use of OLS does not drive the results.

Finally, we re-estimated the models using exploratory principal component analysis of the 7 investor protection variables. The results obtained (not reported) were nearly identical to those in Table 5 in terms of the sign and statistical significance.

6. Conclusion

Our results suggest that IFRS adoption per se does not lead to increased earnings quality. However, we find that earnings quality does increase with IFRS adoption where a country's investor protection regime gives stronger protection to investors. This study reinforces the findings of other cross-country studies: earnings are of relatively higher quality in countries with strong 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 regimes. These results are consistent with Leuz et al. (2003); La Porta et al. (1998; 2000; 2002; and 2006); Francis and Wang (2008), and Ball et al. (2003) who concluded that adopting high quality standards was a necessary condition for acquiring high quality information, without being a sufficient one. The results highlight the importance of strong investor protection in promoting earnings quality even given high quality reporting standards.

This study is subject to several limitations. Firstly, the assumption that discretionary accrual is an adequate (inverse) measure of earnings quality. Secondly, the assumption that a country's overall investor protection does not vary over a relatively short period of time, because changing a country's overall investor protection quality is difficult and costly (Soderstrom and Sun 2007: 37). For example, some countries have substantially renewed their investor protection systems to support the adoption of IFRS. Furthermore, as with all empirical studies, there is the possibility of bias from omitted variables, e.g. company level variables often vary systematically between countries (such as block ownership i.e. government, family and institutional ownership).

We also acknowledge the limitations with respect to the measurement of the variables. The investor protection variables, especially, are categorical in nature and were determined in different years. Finally, we note that our study is limited to a relatively short time period after the introduction of mandatory IFRS adoption. Whether the observed effects are sustained in the long run is also a matter for future research.

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Table 1: Descriptions of variables

Variable	Measure	Description	Data Source
Dependent variables			
Earnings Quality	Discretionary accruals (DACCR)	DeFond and Park (2001) model	OSIRIS (2009)
Independent variables			
Investor protection	IFRS	Dummy variable takes the value of 1 for a given country in years from mandatory IFRS adoption and 0, otherwise.	Deloitte IAS Plus Website (2008)
	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)
	Enforcement of securities laws	Aggregate measure of regulation of securities exchanges in the country and ranges from 1 to 7, where 1 signifies not transparent, ineffective and subject to influence from industry and government, and 7 signifies transparent, effective and independent from undue influence from industry and government.	World Economic Forum (2008)

	Protection of minority shareholders' interest	Measure 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 & 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 enforcement and 7 signifies extremely strong.	World Economic Forum (2008)
	Judicial independence	Measure of the efficiency and integrity of the legal environment as it affects business. Ranges from 1 to 7; with lower scores at lower levels of efficiency and integrity.	World Economic Forum (2008)
	Freedom of the Press	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. It ranges from -1.66 to 1.72, with higher scores indicating freedom.	Kaufman et al. (2007)
Control variables	SIZE	Natural logarithm of total assets in \$ thousands for firm <i>i</i> in year <i>t</i>	OSIRIS (2009)
	LEV	Total long-term debt / Total assets for firm <i>i</i> in year <i>t</i>	OSIRIS (2009)
	GWTH	Sales growth rate, defined as the sales in year <i>t</i> minus sales in	OSIRIS (2009)

		year $t-1$ and scaled by sales in year $t-1$	
	CFO	Operating cash flows for firm i in year t scaled by lagged total assets	OSIRIS (2009)
	Δ PPE	Growth rate of PPE, defined as the gross PPE in year t minus gross PPE in year $t-1$ and scaled by gross PPE in year $t-1$	OSIRIS (2009)
	LAGLOSS	Dummy variable equals 1 if firm i reports negative income before extraordinary items in year $t-1$	OSIRIS (2009)

Table 2

Panel A: Sample selection

	<u>DACCR</u> <u>Analysis</u>
Total number of observations for 1998-2007	505,594
Less: Observations from countries not in the list of the WEF report (2008)	(46,298)
Less: Missing values on dependent and independent variables	(324,644)
Less: Financial institutions and utilities	(25,522)
Less Observations with any variables registering in the top or bottom 1%	(2,107)
Less: Observations with $ \text{Studentized residuals} > 3$ in estimation of DACCR	<u>(2,675)</u>
Number of observations used in the tests	<u>104,348</u>

Table 2

Panel B: Sample distribution by year and country

Country	2000	2001	2002	2003	2004	2005	2006	2007	Total
Australia	61	69	72	249	372	536	577	577	2513
Argentina	19	29	38	52	56	58	58	58	368
Austria	29	33	33	34	39	39	39	39	285
Belgium	29	35	42	55	70	103	108	108	550
Brazil	181	194	195	201	274	274	276	276	1871
Canada	204	261	272	296	318	1057	1057	1057	4522
Chile	112	132	146	180	186	371	370	370	1867
China	64	65	131	536	585	981	1120	1124	4606
Columbia	7	8	11	12	19	19	19	19	114
Czech Rep	28	36	45	46	53	25	26	25	284
Egypt	29	52	67	240	240	277	283	283	1471
Finland	16	21	21	57	57	77	93	97	439
France	149	159	184	294	308	712	712	712	3230
Germany	165	175	136	318	386	443	464	464	2551
Hong Kong	3	19	20	36	86	104	104	104	476
India	113	140	251	313	850	1138	1391	1391	5587
Indonesia	10	10	16	108	155	162	176	176	813
Ireland	10	21	21	21	25	55	55	55	263
Israel	18	18	14	18	137	169	203	230	807
Italy	30	71	93	163	161	178	178	178	1052
Japan	81	95	104	1546	1836	2045	2046	2046	9799
K. South	310	702	830	835	852	1303	1303	1314	7449
Kuwait	4	5	6	18	21	25	25	25	129
Malaysia	52	62	93	373	442	537	537	537	2633
Mexico	67	77	93	115	118	131	131	131	863
Netherlands	12	16	18	74	92	112	112	112	548
Nigeria	3	3	6	9	16	22	22	22	103
Norway	12	14	14	106	106	106	106	106	570
Pakistan	40	64	71	85	105	127	127	127	746
Peru	17	25	25	25	68	97	97	97	451
Philippines	25	25	30	106	125	125	125	125	686
Poland	13	13	17	20	30	30	33	33	189
Russia	7	7	16	25	50	60	109	109	383
Singapore	26	26	37	149	198	461	461	461	1819
S. Arabia	12	18	18	32	38	83	83	83	367
S. Africa	25	35	37	95	128	162	162	162	806
Spain	28	30	68	82	84	87	87	87	553
Sweden	22	22	24	186	188	340	340	340	1462
Switzerland	24	22	28	36	50	98	98	98	454
Thailand	11	11	11	234	237	238	238	238	1218
Turkey	1	2	2	4	40	58	89	89	285
UAE	6	10	11	11	21	28	36	36	159
UK	269	305	333	356	524	1018	1018	1018	4841
USA	3544	3865	3956	4050	4415	4615	4615	4615	33675
Venezuela	8	8	8	15	15	16	21	21	112
Viet Nam	30	30	30	43	45	67	67	67	379
Total	5926	7040	7694	11859	14221	18769	19397	19442	104348
%	5.68%	6.75%	7.36%	11.40%	13.62%	17.98%	18.58%	18.63%	100%

Table 2

Panel C: Sample distribution by industry and country

Country	Energy	Materials	Industrials	Cons. discre.	Cons. staples	Health care	Infor. tech	Telec. serv	Total
Australia	456	476	253	345	253	351	232	147	2513
Argentina	47	86	80	72	16	12	28	27	368
Austria	8	31	86	55	20	11	69	5	285
Belgium	21	88	85	74	63	86	113	20	550
Brazil	117	539	366	298	174	121	116	140	1871
Canada	642	2041	624	428	235	232	219	101	4522
Chile	116	895	164	225	224	103	78	62	1867
China	275	652	956	655	475	705	842	46	4606
Columbia	5	18	15	18	29	8	7	14	114
Czech Rep	12	58	33	46	38	42	26	29	284
Egypt	20	222	183	404	395	178	32	37	1471
Finland	5	65	112	85	44	30	86	12	439
France	65	273	852	747	311	276	666	40	3230
Germany	19	200	598	594	175	227	695	43	2551
Hong Kong	13	75	112	96	39	15	87	39	476
India	82	1238	782	952	961	756	753	63	5587
Indonesia	55	168	117	175	115	89	69	25	813
Ireland	39	51	37	29	44	36	23	4	263
Israel	66	150	102	89	128	103	122	47	807
Italy	61	129	117	474	69	70	102	30	1052
Japan	150	1687	2347	2403	879	368	1897	68	9799
K. South	95	1442	1342	1221	459	840	1992	58	7449
Kuwait	26	27	21	25	12	6	6	6	129
Malaysia	125	671	435	601	429	108	206	58	2633
Mexico	4	215	235	188	164	15	6	36	863
Netherlands	29	39	154	112	48	53	101	12	548
Nigeria	15	32	12	15	12	8	7	2	103
Norway	85	40	132	51	66	62	122	12	570
Pakistan	28	225	94	92	112	42	115	38	746
Peru	6	129	73	96	131	1	6	9	451
Philippines	87	139	98	88	115	14	108	37	686
Poland	8	47	47	32	16	9	21	9	189
Russia	54	84	90	56	43	14	13	29	383
Singapore	84	244	615	298	92	87	352	47	1819
S. Arabia	24	119	68	39	61	13	15	28	367
S. Africa	9	145	190	168	142	34	84	34	806
Spain	28	125	142	112	75	37	24	10	553
Sweden	24	220	460	194	55	212	260	37	1462
Switzerland	12	82	85	84	43	64	75	9	454
Thailand	39	270	219	262	223	62	102	41	1218
Turkey	9	89	26	64	43	16	29	9	285
UAE	5	32	29	24	39	14	12	4	159
UK	135	660	1096	1213	296	446	907	88	4841
USA	1147	9753	6745	5609	3254	3254	2456	1457	33675
Venezuela	5	52	11	10	16	6	6	6	112
Viet Nam	12	143	62	34	62	13	26	27	379
Total	4369	24166	20502	18952	10695	9249	13313	3102	104348
%	4.19%	23.16%	19.65%	18.16%	10.25%	8.86%	12.76%	2.97%	100%

Table 3

Panel A: Descriptive statistics for firm-level regression variables (N = 104,348)

Variables	Mean	Std. Dev.	25 th Percentile	Median	75 th Percentile
DACCR	-0.012	0.125	-0.068	-0.011	-0.049
SIZE	5.109	0.885	4.492	5.092	5.710
LEV	0.473	0.245	0.285	0.481	0.655
GWTH	0.116	0.396	-0.052	0.070	0.197
CFO	0.054	0.154	0.011	0.078	0.123
Δ PPE	0.136	0.367	-0.011	0.069	0.189
LAGLOSS	0.296	0.466	0	0	1

DACCR is discretionary accruals scaled by lagged total assets. SIZE is the natural logarithm of total assets in \$ thousands for firm i in year t . LEV is total long-term debt / Total assets for firm i in year t . GWTH is the Sales growth rate, defined as the sales in year t minus sales in year $t-1$ and scaled by sales in year $t-1$. CFO is the Operating cash flows for firm i in year t scaled by lagged total assets. Δ PPE is the Growth rate of PPE, defined as the gross PPE in year t minus gross PPE in year $t-1$ and scaled by gross PPE in year $t-1$. LAGLOSS is dummy variable equals 1 if firm i reports negative income before extraordinary items in year $t-1$.

Table 3

Panel B: Summary of country-level variables

Country	Mean DACCR	Median DACCR	BIND	SEC	MIN	ACC	JUD	PRESS
Australia	.0186	.0191	5.81	6.22	5.86	6.24	6.4	1.4393
Argentina	.0133	.0767	4.67	4.41	3.58	4.01	2.17	.2940
Austria	-.0141	-.0152	5.63	5.80	5.86	6.23	6.06	1.3637
Belgium	-.0173	-.0172	5.41	5.84	5.61	6.01	5.37	1.4129
Brazil	-.0098	-.0081	4.63	5.14	4.80	4.79	3.14	.3637
Canada	.0107	.0117	5.57	5.64	5.63	6.07	6.01	1.5409
Chile	-.0629	-.0361	5.53	5.98	5.27	5.53	4.25	.9814
China	-.0129	-.0128	4.01	3.42	3.61	3.84	3.43	-1.5884
Colombia	.0108	.0089	4.85	4.94	4.49	4.50	3.81	-.3205
Czech Republic	-.0218	-.0102	5.03	4.90	4.13	4.93	4.10	.8817
Egypt	-.0133	-.0129	4.39	3.93	4.51	4.62	4.86	-1.0388
Finland	.0177	.0179	5.67	5.82	5.88	6.22	6.43	1.6319
France	-.0210	-.0214	5.37	5.94	5.10	6.11	5.26	1.2793
Germany	-.0176	-.1809	5.69	5.95	6.14	6.34	6.53	1.4224
Hong Kong	.0164	.0183	5.34	6.19	5.61	6.20	5.94	.5125
India	-.0832	-.0874	5.03	5.52	5.31	5.65	5.30	.4171
Indonesia	-.1010	-.1009	5.36	5.58	5.74	4.52	2.97	.2763
Ireland	-.0171	-.0183	5.50	5.95	5.77	6.21	6.01	1.4342
Israel	.0198	.0207	5.23	5.52	5.40	5.93	6.03	.6995
Italy	-.0156	-.0145	5.32	4.47	3.97	4.46	3.79	1.0091
Japan	.0151	.0156	5.15	5.24	4.98	5.23	5.51	.9935
Korea South	-.0142	-.0140	5.21	5.92	5.12	5.42	5.13	.6776
Kuwait	-.1492	-.1701	4.60	4.42	4.40	5.32	5.23	-.3498
Malaysia	-.0122	-.0123	5.39	5.48	5.53	5.73	5.24	-.3881
Mexico	.0728	.0604	4.61	5.10	4.44	4.63	3.58	.1761
Netherlands	.0174	.0184	5.62	5.70	5.58	6.02	6.41	1.6082
Nigeria	-.0154	-.0168	4.97	5.05	4.33	4.14	3.52	-.6251
Norway	.0157	.0177	5.55	5.81	5.76	6.06	6.09	1.5790
Pakistan	-.0316	-.0337	3.57	3.96	4.97	4.92	3.51	-1.1092
Peru	-.0731	-.0468	4.68	5.31	4.23	4.77	2.19	-.0331
Philippines	.0148	.0162	4.72	4.81	4.66	4.96	3.31	-.0255
Poland	.0215	-.0229	4.13	4.95	4.25	4.38	3.54	.9865
Russia	-.0163	.0421	4.96	3.57	3.14	3.94	2.70	-.8028
Singapore	.0144	.1517	5.61	5.99	5.55	6.10	5.60	-.1786
Saudi Arabia	-.0801	-.0795	4.73	3.91	4.40	4.72	4.39	-1.5268
South Africa	.1185	.1252	5.73	6.02	6.02	6.22	5.45	.7641
Spain	.0839	.0639	5.00	4.93	4.93	5.25	5.13	1.1678
Sweden	.0217	.0224	6.09	6.26	6.26	6.32	3.76	1.5430
Switzerland	-.01467	-.0159	5.41	5.85	5.85	6.13	6.16	1.5301
Thailand	-.0932	-.0941	4.83	5.26	5.26	5.02	6.30	-.1624
Turkey	.1081	.0839	4.34	5.23	5.23	4.82	4.72	-.1346
UAE	.1381	.1421	4.59	4.80	4.80	5.20	4.40	-.8136
UK	.0179	.0186	5.92	5.79	5.79	6.29	6.04	1.3937
USA	-.0241	-.0227	5.47	5.52	5.52	5.79	5.06	1.2961
Venezuela	-.0142	-.0133	4.29	4.49	4.49	4.06	1.19	-.4419
Viet Nam	.1552	.1292	4.46	4.31	4.31	3.89	3.61	-1.5813

BIND is the board independence scores from World Economic Forum (2008). SEC is the enforcement of securities laws scores from World Economic Forum (2008). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008). JUD is the judicial independence scores from World Economic Forum (2008). PRESS is the freedom of the press scores from Kaufman et al. (2007).

Table 4

Pearson correlation matrix (n=46)

	BIND	SEC	MIN	ACC	JUD	PRESS
BIND	1					
SEC	0.824 (0.<01)	1				
MIN	0.789 (0.<01)	0.845 (0.<01)	1			
ACC	0.809 (0.<01)	0.832 (0.<01)	0.889 (0.<01)	1		
JUD	0.710 (0.<01)	0.662 (0.<01)	0.802 (0.<01)	0.885 (0.<01)	1	
PRESS	0.711 (0.<01)	0.773 (0.<01)	0.638 (0.<01)	0.725 (0.<01)	0.580 (0.<01)	1

Note: p-values are in parenthesis.

BIND is the board independence scores from World Economic Forum (2008). SEC is the enforcement of securities laws scores from World Economic Forum (2008). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008). JUD is the judicial independence scores from World Economic Forum (2008). PRESS is the freedom of the press scores from Kaufman et al. (2007).

Table 5

Regression Analysis of Signed Discretionary Accruals with IFRS adoption

$$DACC_{it} = \beta_0 + \beta_1 IFRS + \beta_2 INV + \beta_3 IFRS * INV + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 GWTH_{it} + \beta_7 CFO_{it} + \beta_8 \Delta PPE_{it} + \beta_9 LAGLOSS_{it} + \text{fixed effects}$$

Independent variables	INV = BIND	INV = SEC	INV = MIN	INV = ACC	INV = JUD	INV = PRESS
	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)	Estimate (p-value)
IFRS	0.002 (0.52)	0.001 (0.68)	0.002 (0.46)	0.003 (0.34)	0.001 (0.59)	0.002 (0.48)
INV	0.000 (0.78)	0.016 (0.21)	0.006 (0.62)	0.000 (0.52)	0.001 (0.18)	0.000 (0.62)
IFRS* INV	-0.002 (0.05)	-0.021 (<0.01)	-0.013 (<0.01)	-0.011 (<0.01)	-0.010 (<0.01)	-0.040 (<0.01)
SIZE	0.006 (<0.01)	0.007 (<0.01)	0.007 (<0.01)	0.007 (<0.01)	0.007 (<0.01)	0.008 (<0.01)
LEV	-0.045 (<0.01)	-0.045 (<0.01)	-0.045 (<0.01)	-0.045 (<0.01)	-0.045 (<0.01)	-0.044 (<0.01)
GWTH	0.003 (<0.01)	0.003 (<0.01)	0.003 (<0.01)	0.003 (<0.01)	0.003 (<0.01)	0.005 (<0.01)
CFO	-0.365 (<0.01)	-0.365 (<0.01)	-0.365 (<0.01)	-0.365 (<0.01)	-0.367 (<0.01)	-0.362 (<0.01)
APPE	0.004 (0.36)	0.004 (0.36)	0.004 (0.36)	0.004 (0.35)	0.004 (0.36)	0.005 (0.38)
LAGLOSS	-0.123 (<0.01)	-0.123 (<0.01)	-0.123 (<0.01)	-0.123 (<0.01)	-0.123 (<0.01)	-0.131 (<0.01)
Constant	0.002 (0.82)	0.001 (0.96)	0.005 (0.52)	0.007 (0.68)	0.001 (0.88)	0.006 (0.59)
fixed effects	included	included	included	included	included	included
Adj. R²	0.362	0.362	0.362	0.362	0.363	0.359
N	104,348	104,348	104,348	104,348	104,348	104,348

Note: Coefficient p-values applied two-tail and based on asymptotic Z-statistic robust to heteroscedasticity and country clustering effects using the method in Rogers (1993).

IFRS takes the value of 1 for a given country in years after mandatory IFRS adoption and otherwise 0. BIND is the board independence scores from World Economic Forum (2008). SEC is the enforcement of securities laws scores from World Economic Forum (2008). MIN is the protection of minority shareholders interest scores from World Economic Forum (2008). ACC is the enforcement of accounting & auditing standards scores from World Economic Forum (2008). JUD is the judicial independence scores from World Economic Forum (2008). PRESS is the freedom of the press scores from Kaufman et al. (2007). DACC is discretionary accruals scaled by lagged total assets. SIZE is the natural logarithm of total assets in \$ thousands for firm *i* in year *t*. LEV is total long-term debt / Total assets for firm *i* in year *t*. GWTH 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*. CFO is the Operating cash flows for firm *i* in year *t* scaled by lagged total assets. ΔPPE is the Growth rate of PPE, defined as the gross PPE in year *t* minus gross PPE in year *t-1* and scaled by gross PPE in year *t-1*. LAGLOSS is dummy variable equals 1 if firm *i* reports negative income before extraordinary items in year *t-1*.