

# **Did the market overreact to the mandatory switch to IFRS in Europe?**

## ABSTRACT

Despite studies which indicate that mandatory adoption of International Financial Reporting Standards (IFRS) reduced the cost of capital for adopting firms and improved analysts' forecasts, the evidence supporting any improvement in accounting quality is mixed. In a European wide country study, we calculate a broadly based measure of earnings management defined as accruals which are unrelated to current activity or past-current-future cash flows. At the individual country level we find that accounting quality improved only in France, Germany and Netherland, which are categories as 'legal origin countries'. Moreover, based on an equity valuation model adjusted for earnings quality, we find that, in most European countries, the market overreacted to the impact of mandatory IFRS adoption. Further test shows that investors do not seem to understand the exact components of the financial statements that IFRS will have impact on.

## I. INTRODUCTION

In 2005 International Financial Reporting Standards (IFRS) were mandatory for quoted companies within the European Union (EU). This was a major step to promote harmonisation within the EU, mirroring the audacious promotion of worldwide standards by the International Accounting Standards Board (IASB). The cost of the development and promotion of IFRS was (and still is) significant both for regulators and companies. Of course, the harmonisation of standards does not require that all companies improve the quality of their financial reporting, but some improvement is to be expected. Therefore an important question is whether accounting quality has improved following the mandatory adoption of IFRS within the EU. An associated, and equally important, question is whether financial markets have responded appropriately.

Whether accounting quality is improved has been researched in a number of ways. One approach is to examine the impact of IFRS adoption on the security market. Measuring impact through security price change, the evidence is generally supportive. Another group of studies focus on analysts' forecasts, examining the information environment surrounding the formation of prices, for example Horton et al. (2013). Here again, the evidence suggests that there is a beneficial effect of mandatory IFRS.

Other studies take a more direct approach and examine the quality of reporting. Despite the superficial attraction of assessing the impact of IFRS through accounting quality, this approach has its own problems, namely the measure of accounting quality. Several measures have been used; earnings smoothing; loss avoidance; managing towards a target (for example, last year's earnings or the analysts' consensus forecast). Although accounting quality should include such aspects, accounting quality is a broader concept. In response to this concern, studies have used the well-established measure of earnings management, as measured by discretionary accruals (Jones 1991; Dechow et al. 1995). This method identifies

earnings management as accruals which cannot be explained by the firm's current sales activity or by its stock of plant, property and equipments. We follow this approach except that we use the McNichols (2002) enhancement which allows the explained accruals to include also those accruals which relate to past, current and future cash flows. This adjustment makes sense because, for example, accruals may be recognising future losses, unrelated to current activity. Furthermore, McNichols demonstrates that the modification improves the estimate of discretionary accruals.

The first contribution we make is that, unlike other studies, we do not aggregate observations from different countries. This avoids the need to classify each country according to the strength of its enforcement procedures and according to the difference between the prior local GAAP and IFRS. We conduct the McNichols (2002) earnings quality test for the majority of European countries and find that, indeed, earnings quality improves only in France, Germany and Netherland following IFRS adoption in 2005.

The second contribution we make is that, in addition to investigating whether or mandatory IFRS improved accruals quality, we assess the size of the market's response. In order to achieve this, we construct a quality-adjusted measure of earnings, as part of an earnings and investment opportunities valuation model similar to that of Modigliani and Miller (1961). Given that each observation for earnings is already adjusted for accrual quality, there should be no change in the coefficient of 'accounting quality weighted earnings' before and after mandatory IFRS adoption in 2005. In contrast to this expectation, we find that the coefficient on quality-adjusted earnings increases in the post 2005 era, suggesting an overreaction to the improvement in earnings quality. We argue that this is not surprising given (i) the significant promotion of IFRS undertaken by regulators, (ii) the core competence of analysts being outside of accounting, and (iii) the difficulty which individuals find in deviating from the group consensus.

The rest of the paper is organised as follows. The next section outlines the background and prior work. The third section describes the contribution, which is followed by the research design, the sample selection process and results. The final section is the conclusion.

## **II. PRIOR LITERATURE**

### **Security Market Impact**

Following the mandatory adoption of IFRS in Europe by quoted companies from 2005, an important question, in view of the significant costs involved by both regulators and companies, is whether the quality of financial reporting improved as a result. One approach to assessing the impact of IFRS is to examine how the security market is affected. Several studies have followed this path and generally the findings are positive. For example, Armstrong et al. (2010) examine 3-day returns of 3,265 European firms around 16 events in the run up to mandatory adoption which affected the likelihood of adoption of IFRS in Europe. They find a positive market reaction except in code law countries, which is consistent with investors' concerns over enforcement. Other studies analyse the stock price effects of the IFRS disclosures once they are mandatory, such as Daske et al. (2008) and Li (2010). Both of these studies find that there is a positive price impact, associated with a reduction in the cost of capital, in countries where there is strong legal enforcement.

A weakness of examining the stock price response is that the evidence captures simply the association between (i) shifts in the market's assessment of securities and (ii) the adoption of IFRS. What has changed following IFRS adoption is left ambiguous. The implied change is an improvement in accounting quality, but this is not documented. In the light of this drawback, other studies have tried to identify an improvement in analysts' information environment following IFRS adoption. If an improvement in forecast accuracy can be found, then it is more likely that mandatory IFRS has improved reporting quality. Examples of such

studies are Byard et al. (2011) and Horton et al. (2013). They find that analysts' forecast errors are in fact reduced following IFRS adoption, which suggests that mandatory IFRS improved financial disclosure. A recent study which specifically takes account of changes in enforcement accompanying IFRS adoption is Christensen, Hail, and Leuz, (2013), who examine changes liquidity (as measured by bid-ask spreads). They find that increases in liquidity (decreases in bid-ask spreads) following mandatory IFRS are largely driven by changes in enforcement. However, it is not clear that IFRS should have increased liquidity. Kim and Verrecchia (1994) show that informative earnings disclosure may in fact decrease liquidity by increasing the information asymmetry between traders and market makers. Such a scenario would seem to be even more likely when new measurement methods are being used.

### **Accounting Quality Impact**

Other studies take a more obvious approach and tackle the substantive issue directly, assessing whether or not accounting quality has improved post IFRS. However, this approach is not as effective as it might seem since accounting quality is imprecisely defined. Given the importance of earnings to equity valuation, the vast majority of studies define accounting quality as earnings quality, but even this limited aspect of accounting quality is difficult to capture. A number of approaches have been taken.

First, since accounting quality is to be found largely in the accruals process, studies such as Barth et al. (2008) examine the relative volatility of earnings to cash flows, with low volatility being taken as evidence of poor quality (i.e. earnings smoothing). This measure of earnings quality is consistent with Ball and Shivakumar (2005) where accruals capture the early recognition of losses, and hence earnings are more volatile than cash flows. However, the measure assumes that *any* increase in volatility of earnings relative to cash flows is an

aspect of good quality accounting; a strong assumption. Thus the measure may indicate good quality when in fact the opposite is true.

A second measure of accounting quality used is the extent to which companies manage earnings towards a positive target, following Burgstahler and Dichev (1997). However, this measure is criticised by several papers, since there are other explanations for the results; see for example Durtschi and Easton (2009), Beaver et al. (2007), and Ayers et al. (2006).

Thirdly, in a related vein, other studies such as Ahmed et al. (2013) and Barth et al. (2008) examine whether companies following IFRS report losses more frequently than non IFRS companies. However, this measure captures only a very minor part of the expected improvement from IFRS, which should provide improved information about performance well ahead of the company being in a loss making situation.

A fourth approach to accounting quality is the well-trodden path of estimating earnings management through discretionary accruals, based on the cross-sectional version of Jones (1991) model. Examples of such studies are Ipino and Parbonetti (2011) and Jeanjean and Stolowy (2008). This measure of quality has promise since it is a well-established and broad measure of quality. It is also able to identify different types of earnings management from income smoothing to manipulation towards a target. It achieves this by defining discretionary accruals as those which cannot be explained by the current activity of the firm, which is measured by the change in sales and the level of plant property and equipment.

Given the variety of research methods used to investigate earnings management under IFRS, it is not surprising that the results are mixed. For example: Ahmed et al. (2013) find that IFRS firms exhibit significant increases in income smoothing and aggressive reporting of accruals, and a significant decrease in timeliness of loss recognition; Jeanjean and Stolowy (2008) find that earnings management has not declined; and Barth et al. (2008), albeit focussing on voluntary adoption, find an improvement in accounting quality. These varied

findings contrast with the unambiguous results from the stock price impact and the analyst forecast studies which suggest an improvement in accounting quality following mandatory IFRS adoption for countries which enforce the standards.

### **III. CONTRIBUTION**

#### **Disaggregated Analysis**

The first contribution of the paper is to provide a country-by-country analysis. Other studies typically provide their results for all the countries investigated, with some adjustment for the institutional differences between countries, specifically: (i) the difference between IFRS and domestic GAAP prior to IFRS, and (ii) the extent to which regulation is enforced. However, accounting for these other factors is problematic. There are weaknesses in capturing differences between IFRS and domestic GAAP; see for example Nobes (2009). The measures used are an aggregate of differences over a large number of areas, and apart from the equal weighting given to each area, the differences are often unsigned, i.e. do not capture whether domestic GAAP is worse or better than IFRS.

The enforcement, or rule of law indices are typically based on perceptions. These, of course, suffer from the potential problem of inter country differences in perceptions, since perceptions are likely to be framed by local conditions. This has led some researchers to regard such indices as fatally flawed (Kurtz and Schrank 2007). In addition, the rules of law indices are not specific enough to accounting (Preiato et al. 2012).

A further disadvantage of the investigating countries aggregated together is that it is not clear whether the results obtained are to be found throughout the sample or whether they are driven by just a few countries. This distinction is clearly important from a policy viewpoint.

#### **The Magnitude of the Security Market Impact**

Secondly, and probably more important, new feature of the paper is that, in addition to investigating whether mandatory IFRS improved accounting quality, we evaluate the size of



the market's response. It is important to investigate this issue, since there are three institutional features which may have led to an overreaction to IFRS. Firstly, since its inception in 1973 the International Accounting Standards Committee and subsequently the IASB has achieved remarkable success in its promotion of a single worldwide set of accounting standards to facilitate and encourage the global economy (Ball 2006). This achievement has involved much promotion, debate and argument over a long period of time. Indeed, Young (2003) in discussing the work of the Financial Accounting Standards Board in the USA, argues that accounting standards themselves are an exercise in persuasion through the rhetorical devices which are used to present their conclusions as a rational, sensitive and practical response to business conditions. Arguments with which the IASB has had to battle include Goeltz (1991) who claims that international standards are not necessary because the global economy has succeeded quite well without them. More recently Ball et al. (2003) and Ball (2006) argue that enforcement matters as much as standards in achieving high quality reporting. Therefore the benefits claimed by the IASB for achieving a universal business language are perhaps premature. The limitations to harmonisation between countries, despite their adoption of IFRS, are well documented in Kvaal and Nobes (2012), Nobes (2011), Zeff and Nobes (2010), and Nobes (2006). The achievements of IFRS are limited because of different versions, translations, and interpretations of IFRS as well as the gaps and choices in the standards. Hence, the well-known difference between Anglo Saxon and Continental European countries is still evident even in 2009.

Consequently, in their promotional success the IASB may have allowed an illusion to be created, that IFRS will give rise to a greater improvement than is achievable. An important issue, therefore, is not only whether investors have reacted to the improvement in accounting quality, but whether their reaction is of the correct magnitude.

A second reason why an inappropriate adjustment of share prices to mandatory IFRS is possible, even likely, is that financial statement analysis is not the core competence of professional investors. Barker (2000) reports that they are mostly concerned with understanding the performance of the company from an economic perspective. Goeltz (1991) and Bouwman et al. (1987) make clear that the foremost concern when making investment decisions is not the quality of accounting standards. It is unnecessary to have accounting measurements on exactly the same basis since broad brush adjustments are enough. Therefore, professional investors are likely to take on trust the benefits which are said to come from a common, and improved, set of global accounting standards.

Thirdly, research in behavioural finance suggests that it is difficult for individuals to deviate from the group consensus (Janis 1982; Shiller 2001). This is especially true when judgments are complex and feedback is limited, as in the case of the benefits of accounting standards. In addition, Lo (2004) in the discussion of the Adaptive Markets Hypothesis, argues that investors find it difficult to adapt to a changing environment since the heuristics which have worked in the past are no longer suitable. Obeisance to conventional wisdom is strong.

For these three reasons, (i) the persuasion undertaken by IASB, (ii) the core competence of market agents being outside of accounting, and (iii) the behavioural difficulty of escaping the group consensus, we address the issue of overreaction to the achieved improvement in accounting quality following mandatory IFRS.

#### **IV. RESEARCH DESIGN**

The main thrust of our research design is to construct an equity valuation model which includes accounting quality. Since the model already captures accounting quality, the model

coefficient should not shift between pre and post IFRS periods. Any observed shift is then an indication of overreaction or under reaction.

### **Accounting Quality**

Our measure of accounting quality is based on the extension of Dechow and Dichev's model (Dechow and Dichev 2002) suggested by McNichols (2002). A potential problem with measuring earnings management based on the residuals from the cross-sectional Jones (1991) model, is that some residuals may be informative about future cash flows rather than the product of manipulation. For example, accruals which are an early recognition of future losses are treated as earnings management unless they are correlated with either the change in revenue and or with plant property and equipment (the explanatory variables in the Jones model).

McNichols (2002) deals with this by using the relation between accruals and cash flows developed by Dechow and Dichev (2002) to purge the Jones (1991) model residuals of these informative deviations. We estimate the residual from the extended Jones (1991) model by McNichols (2002) as follows :

$$ACC_{j,t} = \theta_0 + \theta_1 CFO_{j,t-1} + \theta_2 CFO_{j,t} + \theta_3 CFO_{j,t+1} + \theta_4 \Delta Rev_{j,t} + \theta_5 PPE_{j,t} + \mu_{j,t} \quad (1)$$

where:  $ACC_{j,t}$  is total accruals;  $CFO_{j,t}$  is cash flows from operation;  $\Delta Rev_{j,t}$  is change in sales; and  $PPE_{j,t}$  is plant property and equipment, for company  $j$  at year  $t$ , respectively.<sup>1</sup> Our measure of accounting quality  $AQ_{j,t}$  is then defined as:

$$AQ_{j,t} = 1 - |\mu_{j,t}| \quad (2)$$

where  $\mu_{j,t}$  is the residual estimated from Equation (1) above.

The absolute value of the residual is taken so that accounting quality is the same for both negative and positive residuals, and is deducted from one so that smaller residuals are

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<sup>1</sup> The exact definitions of all the variables are contained in the Appendix.

associated with greater accounting quality than larger residuals.<sup>2</sup> The measurement of earnings quality by a single number is consistent with observed practice amongst chief finance officers and standard setters (Dichev, Graham, Harvey and Rajgopal, 2013).

### **The valuation model**

The first component of the valuation model is earnings which is almost the universal approach to valuation in practice; see for example Govindarajan (1980), Arnold and Moizer (1984), Barker (1999b) and Demirakos et al. (2004). There is also empirical support for this emphasis on earnings from Dechow et al. (1999) who find that the model which has the smallest forecast error in explaining security prices is the earnings capitalisation model.<sup>3</sup> However, Barker (1999a) in his interviews with professional investors finds that they do not take earnings at the face value and make adjustments based on their assessment of management. The rationale is that the management of the company will have a strong influence on future performance; and since the management is observable it can be evaluated. In the spirit of this adjustment, we multiply reported earnings with our estimate of earnings quality, to give a quality adjusted measure of performance, weighted earnings.

In our model, the coefficient on weighted earnings is affected by the general conditions in the economy, as reflected in the change in gross national product. The basis for this is that investors are buying not just this year's earnings but a stream of earnings. It is difficult for any company to avoid the general macroeconomic environment in which it operates and the therefore the state of the economy will affect the importance placed on the current weighted earnings.

As well as single period earnings, Demirakos et al. (2004) find that multi-period factors also play a part in valuation in industries such as pharmaceuticals. This arises from the

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<sup>2</sup> Obviously, a problem arises if the absolute value of a residual exceeds one, since accounting quality for that observation would then be negative. However, in the McNichols accruals model, the dependent variable (accruals) is scaled by assets and therefore a negative AQ measure is unlikely. Based on the whole sample the residuals are: mean=0.041; standard deviation=0.035; min=0.000; max=0.367.

<sup>3</sup> This is the model in Dechow et al. 1999, (Table 5, Panel B) where  $\omega=1$  and  $\gamma=0$  (identical to  $\omega=0$  and  $\gamma=1$ ).

importance of research and development and other firm specific actions which may be taken to improve the position of the company. In order to reflect this aspect of valuation we include a capital investment variable in addition to earnings. We also include a book value variable to capture the ability of the company to adapt to changes in the economic environment, as suggested by Burgstahler and Dichev (1997 and Ashton, Cooke and Tippett (2003). When these components of valuation are included, our valuation equation has a similar structure to the classical Modigliani and Miller (1961) investment opportunities approach to valuation, and also to that suggested by Shen and Stark, 2013.

In order to capture the potential effect of mandatory IFRS, we include a dummy variable which may affect the coefficient on weighted earnings and book value. The valuation model is given in equation 3.

$$MV_{j,t} = \alpha + \beta_0 TA_{j,t}^{-1} + \beta_1 WE_{j,t} + \beta_2 WE_{j,t} \cdot \Delta GNP_{j,t} + \beta_3 WE_{j,t} * MD_{j,t} + \beta_4 BV_{j,t} + \beta_5 BV * MD_{j,t} + \beta_6 EX_{j,t} + \varepsilon_{j,t} \quad (3)$$

where:  $MV_{j,t}$  is market value, defined as market value scaled by total asset at the end of fiscal year t.  $TA_{j,t}$  is total assets;  $WE_{j,t}$  is weighted earnings, defined as earnings multiplied by accounting quality;  $\Delta GNP_{j,t}$  is the change in gross national product;  $MD_{j,t}$  is a dummy variable taking a value of 1 if a firm adopts IFRS from 2005 and 0 otherwise;  $BV_{j,t}$  is book value scaled by total asset at the end of fiscal year t; and  $EX_{j,t}$  is a proxy for excess returns on investment scaled by total asset at the end of fiscal year t.

Notable aspects of the model are as follows. The theory of the valuation equation does not require that the variables are scaled by total assets. In our model scaling is applied to all variables to reduce heteroscedasticity, and hence is also applied to the original constant term  $\beta_0$ . We have argued that, for valuation purposes, weighted earnings needs to be viewed in the context of macroeconomic factors, and therefore it is unlikely that the coefficient  $\beta_1$  will be significant. Many IFRS rules are 'fair-value' oriented and therefore favor the balance sheet.

The corresponding changes would have been reflected both in Balance Sheet and in Comprehensive Income Statement rather than ‘net income’. Therefore the variable book value would be able to capture the improvement in accounting quality that comes through the Balance Sheet. The coefficient  $\beta_5$  captures the potential increased emphasis given to the book value of assets under IFRS which places importance on the fair value of assets. Since the weighted earnings variable is already adjusted for the quality of its accruals, the impact of mandatory IFRS is already captured; therefore, the coefficient  $\beta_3$  measures the underreaction ( $\beta_3 < 0$ ) or overreaction ( $\beta_3 > 0$ ) to IFRS. This specification follows the suggestion of Rabin (2013), that psychological assumptions should be specified as alternative parameter values, along with the same independent variables as existing research. The excess returns from the new investment variable,  $EX_{j,t}$  is not adjusted for accounting quality since our quality measure is based on accruals which are unlikely to affect investment.

## V. SAMPLE

### Selection Criteria

Firm valuation, earnings quality measures, and other firm-level variables (including market to book value, earnings, cash flows from operation, capital expenditure, accounting standards that companies follow) are based on accounting and finance data of 8 EU countries (UK, France, Germany, Sweden, Netherland, Denmark, Switzerland and Spain) from 1993 to 2010 and obtained from Thomson Reuters Datastream. The Appendix lists the definition of all the raw variables used in this paper. In order to be included for analysis, companies need to have at least 8 years data.<sup>4</sup> To mitigate the influence of outliers, all firm-level continuous variables are winsorised at the top and bottom 1 percent of their distributions, and

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<sup>4</sup> Due to the selection criteria, there are no observations for Spain left for analysis.

observations with market to book value greater than 3 and lower than -3 are omitted. The final sample consist 9760 firm-year observations from 7 EU countries.

### **Descriptive Statistics**

Panel A of Table1 provides country-level sample descriptive statistics for the variables used in the tests. We can see that the numbers of observations vary widely across sample countries, with the UK having the largest firm-year observations (3319) and Denmark having the smallest (670). Compared with the extant literature (e.g. Li 2010; Barth et al 2008), our sample size is larger, and therefore, be able to account for most of the listed companies in the EU.

[Insert Table 1 about here]

Table 1 also shows that the average market values scaled by total assets have a substantial degree of variation, ranging from 0.0005 (France) to 20.1425 (UK). In addition, the country-level average accruals scaled by total assets are all negative, ranging from -0.7047 (UK) to -1.8270 (UK), and average cash flows from operation scaled by total assets varies from -1.1644 (UK) to 0.7490 (UK). The reason that the data of the UK has a large variation is due to the fact that the UK has the largest sample size, with most of the listed companies being included, regardless of size.

Pearson correlations coefficients between all variables used in the regression models have been reported in Panel B of Table 1. Panel B shows a correlation between market value and weighted earnings with a correlation coefficient of 0.31 ( $p$ -value  $<0.001$ ). This finding suggests that the market value captures common information in accounting quality-adjusted earnings. The results also show a positive relationship between the excess return on capital investment and market value, suggesting that the market does value the capital investment by firms. Besides, accruals has a negative correlation coefficient of -0.49 ( $p < 0.001$ ) with current

cash flows from operation. These results are consistent with Dechow and Dichev (2002), McNichols (2002) and Ball and Shivakumar (2005).

## VI. RESULTS

### Has Accounting Quality Improved?

Panel A of Table 2 lists the descriptive statistics of accounting quality for each individual country. The average accounting quality of Germany and Denmark are relatively poor when compared with other countries in the EU. However, an interesting finding is that the UK has the biggest standard deviation of accounting quality, with the minimum figure of accounting quality as 0.0576 (while for other countries, this figure in average is about 0.7000) and the maximum value as 0.9999. Given that the number of observations is the largest of the UK (and includes most listed companies) it is not surprising that there is substantial variation of accruals quality across firms.

We then estimate the following regression to exam whether accounting quality has improved after the mandatory switch to IFRS:

$$AQ_{j,t} = \gamma + \delta MD_{j,t} \quad (4)$$

Panel B of Table 2 shows the impact of the mandatory adoption of IFRS on accounting quality defined by Equation (1) and (2), as measured by the coefficient  $\delta$ . A positive  $\delta$  implies that accrual quality has improved after the mandatory adoption of IFRS in 2005. The results for the whole sample indicate a positively significant coefficient of 0.0031 with t-statistics of 4.00, suggesting that overall the average accrual quality has improved following the mandatory adoption of IFRS. Our results are consistent with the results of Chen, et al. (2010) and Zeghal, et al. (2012), which find that accounting quality has improved at the aggregate level of 15 EU countries.

[Insert Table 2 about here]



However, in contrast, our results at the individual country level indicate that accruals quality has improved only for a few countries. Our results therefore question the conclusions of other studies that earnings quality consistently improves following IFRS adoption in 2005. As mentioned, prior studies with a pooled sample are unable to capture differences between countries. Our country-by-country analysis indicates that accounting quality has not improved in most of the European countries, and therefore the conclusions of prior studies with a pooled sample need to be treated with caution.

The countries where mandatory IFRS has improved accruals quality are France, Germany, and The Netherlands. France, Germany and UK are usually classified as ‘legal origin countries’, where the shareholder protection has been constantly improved in the last two centuries (Siems 2007). With strong law enforcement to protect shareholders' interest, it is not surprising that accounting quality will be improved in France and Germany after IFRS adoption. It is interesting to notice that our results show that the accounting quality in the UK has not improved. This is reasonable, since there is only a limited difference between the UK GAAP and IFRS. Other European countries are 'transplant countries', which copied the law of one of the origin countries at one point in time. It might take time for shareholders protection to be effective. Our results provide support to this argument and suggest that accounting quality in other countries other than Germany, France (except the Netherland) has not yet improved.

### **Overreaction or Underreaction?**

Table 3 presents the empirical results of multivariate regression analysis of Equation 3. Coefficients of each parameter are reported. Robust t-statistics adjusted for firm and year clustering are reported in parentheses.

[Insert Table 3 about here]

Firstly, as discussed, in the model we include three variables that are related to earnings: weighted earnings, which is defined as earnings multiplied by accounting quality; the weighted earnings multiplied by the changes in GDP, and weighted earnings interacted by mandatory adoption dummy variable of IFRS. We have discussed that when proxy interacted by macroeconomics factor is included, it is not surprising that the coefficients of weighted earnings ( $\beta_1$ ) is not statistically significant; while on the contrary the coefficient  $\beta_2$  should be statistically significant as when weighted earnings is interacted by macroeconomics factor, it captures the weights that the investors put on a stream of weighted earnings. Our results of individual countries generally reflect the proposition. Out of the seven countries, coefficients  $\beta_2$  are statistically significant at 1 percent level for samples of France, Sweden, the UK, Netherland and Switzerland. This implies that investors from these five countries put weight on the weighted earnings interacted by change of GDP. In other words, when investors from these five countries value equities in the market, they focus on not only the current earnings, but also a stream of earnings including future earnings, and they would expect that the future earnings that companies can make are dependent on the macroeconomics condition. For sample of Germany and Denmark, coefficients  $\beta_1$  are statistically significant rather than coefficients  $\beta_2$ , which implies that investors from these two countries, on the contrary, only put weight on current weighted earnings.

Our results indicate that investors seem to value either series of accounting quality adjusted earnings or just current accounting quality adjusted earnings, and the impact of accounting quality is significant on firm value. This finding is consistent with Gaio and Raposo (2011), who also found aggregate earnings quality has significant impact on firm value.

Secondly, the coefficients of the weighted earnings interacted by mandatory adoption dummy variable of IFRS are positive and statistically significant for all countries. The impact

of IFRS on the accounting quality has been incorporated into the measure of weighted earnings. Therefore, if investors react rationally to the mandatory adoption of IFRS, the coefficient of the interacted weighted earnings would be expected to be insignificant. Our results of positively significant coefficient indicate that investors overweigh the impact of the mandatory adoption of IFRS on the market value. This finding of overreaction combined with the evidence that accounting quality has improved in only three countries out of our eight sample countries addresses an issue of overreaction to the impact of mandatory IFRS adoption in accounting quality. As mentioned above, this situation may arise since (i) there is significant promotion of IFRS by domestic regulators and the IASB, (ii) accounting expertise is not the core concern for security investment decisions and (ii) short-termism makes it difficult to deviate markedly from the market consensus.

Thirdly, book value has been adjusted in our model to capture the possible changes due to IFRS ‘marked-to-market’ orientation and has not been reflected in ‘net income’. The item interacted by dummy variable of IFRS adoption will be able to capture the potential increased emphasis given to the book value after adoption of IFRS. For both whole sample and individual country sample, all the coefficients  $\beta_4$  are statistically significant at 1 percent level, which suggests that investors from our sample countries do consider book value when they value a firm. Coefficient  $\beta_5$  is only statistically significant for sample of Denmark. It is 0.21 and significant at 1 percent level, implying that investors from Denmark put extra weight on the book value after the adoption of IFRS. They might think the book value after mandatory adoption of IFRS carries more information than before.

Lastly, 7 out of 9 coefficients for excess returns on capital investment are statistically positive across countries. We believe that this variable is able to reflect the impact of expended capital investment on the market value. Our evidence suggests that market value of

a company increases with the marginal increase of the profit obtained from further capital investment.

It might be argued that improvements in the comparability of financial statements arising from the adoption of IFRS is a potential explanation for our overreaction findings. If companies in one country are more comparable as a result of IFRS, then omitting this variable may give the impression of overreaction. This is unlikely to be the case. First, the paper by DeFranco, Kothari, and Verdi (2011) assumes that comparability is not a component of valuation; the measure of comparability is based on how well earnings maps in to the stock return, which is assumed to capture the impact of all the economic events affecting the company. Secondly, the evidence presented by Yip and Young (2012, Table 4 Panel B) shows that comparability effects are very small, and that if anything IFRS has reduced comparability across national frontiers.

## **VII. ROBUSTNESS TEST**

### **Decomposition of Earnings into Cash Flows from Operation and Accruals**

In order to further investigate the source of the overreaction to earnings, we decompose the earnings into two components: cash flows from operations and accruals. When earnings are replaced by these two components, Equation 3 can be re-written as follows:

$$MV_{j,t} = \gamma + \delta_0 TA_{j,t}^{-1} + \delta_1 CFO_{j,t} + \delta_2 CFO_{j,t} * \Delta GDP_{j,t} + \delta_3 CFO_{j,t} * MD_{j,t} + \delta_4 WACC_{j,t} + \delta_5 WACC_{j,t} * MD_{j,t} + \delta_6 BV_{j,t} + \delta_7 BV_{j,t} * MD_{j,t} + \delta_8 EX_{j,t} + \mu_{j,t} \quad (5)$$

where:  $CFO_{j,t}$  is cash flows from operation;  $WACC_{j,t}$  is weighted accruals, defined as accruals multiplied by accounting quality. As accruals are adjusted by accounting quality,<sup>5</sup> the impact of IFRS should have been incorporated in to WACC. If investor responds rationally to the mandatory adoption, the coefficient  $\delta_5$  should not be significant. A significantly positive

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<sup>5</sup> Cash flows from operation should not be affected by IFRS. Here we assume that investors are aware the difference between cash flows and accruals. Therefore when earnings are decomposed into two components, only accruals are adjusted by the proxy for accounting quality.

coefficient indicates overreaction, whereas a significantly negative coefficient indicates underreaction.

Table 4 presents the estimation results of Equation 5. Firstly, our results indicate that all coefficients of both cash flows from operation  $\delta_2$  are all statistically positive and significant of all the individual countries. This suggests that when valuation by investor is based on a stream of cash flows, and the stream of cash flows are affected by macroeconomics status. Our findings provide support for investment opportunities approach to valuation by Modigliani and Miller(1961). Moreover we have found the same results as we based on earnings as a whole that investors from Germany and Denmark put more weights on current cash flows.

[Insert Table 4 about here]

Our results also show that for the whole sample, the coefficient on the mandatory adoption dummy interacted with CFO ( $\delta_3$ ) is 1.28, and the coefficient on the mandatory adoption dummy interacted with WACC ( $\delta_5$ ) is 0.76. The evidence of statistically significant and positive  $\delta_3$  coefficient and  $\delta_5$  coefficient suggest that in general investors in the European market overreact to the impact of mandatory adoption of IFRS both on the quality of cash flows from operation and the quality of accruals.

When examining the overreaction in each individual country, we find that investors in Germany, Sweden, the UK, Denmark and Switzerland overreact to the accounting quality adjusted accruals, cash flows from operation or book value. This evidence shows that investors are less able to understand the impact of mandatory adoption of IFRS. The don't know the improvement that IFRS could make is reflected in accruals, cash flows or in other forms like book value. Our results are consistent with Xie (2001), who also reports that investors mis-evaluate the components of earnings.

## VIII. CONCLUSION

Our investigation of accounting quality based on McNichols' model (McNichols 2002) suggests that accounting quality with pooled sample of the eight EU countries has improved after the mandatory adoption of IFRS in 2005. However, examination of each individual country shows that accounting quality has been improved only in France, Germany and the Netherland. The evidence questions the existing conclusion that accounting quality has been improved generally, and addresses the issue of prior studies' application of pooled sample data.

The estimation results of earnings and investment opportunity valuation model with accounting quality adjusted earnings suggest that market recognises the possible impact of mandatory adoption of IFRS on accounting quality, but investors actually overreact to the improvement. Given the fact that regulator has significantly promoted IFRS, with 'following the crowd' psycho, investors over-weigh the accounting improvement during valuation process.

When earnings are decomposed into earnings components as cash flows from operation and accruals, our results suggest that investors are less able to understand the way that improvements of IFRS can be reflected, the cash flows, the accruals or book value.

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## APPENDIX

### Variable Definition

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$ACC_{j,t}$	Change of working capital of firm $j$ in year $t$ at the end of fiscal year scaled by total assets at the end of fiscal year $t$
$CAPEX_{j,t}$	The ratio of capital expenditure of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$CFO_{j,t}$	Cash flows from operations of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$Earnings_{j,t}$	Net operating income of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$EX_{j,t}$	Excess return on investment at the end of fiscal year $t$ scaled by total assets at the end of fiscal year $t$ , defined as: $CAPEX_{j,t} * [(MTBV_{j,t} - IR_{j,t}) / IR_{j,t}]$
$IR_t$	3-month T-bill rate at the end of fiscal year $t$
$MD_{j,t}$	Mandatory adoption dummy, which takes the value of 1 if a firm adopts IFRS from 2005, and 0 otherwise
$MTBV_{j,t}$	Market to book ratio of firm $j$ in year $t$
$MV_{j,t}$	Market value of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$BV_{j,t}$	Book value of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$PPE_{j,t}$	Gross value of property, plant and equipment of firm $j$ in year $t$ scaled by total assets at the end of fiscal year $t$
$\Delta Rev_{j,t}$	Change in total sales of firm $j$ between year $t-1$ and $t$ scaled by total assets at the end of fiscal year $t$
$TA_{j,t}$	Total assets of firm $j$ at the end of fiscal year $t$
$WACC_{j,t}$	Weighted accruals, defined as the product of $ACC_{j,t}$ and $AQ_{j,t}$
$WCFO_{j,t}$	Weighted operation cash flows, defined as the product of $CFO_{j,t}$ and $AQ_{j,t}$
$WE_{j,t}$	Weighted earnings, defined as the product of $Earnings_{j,t}$ and $AQ_{j,t}$
$GDP_{i,t}$	GDP growth of country $i$ of fiscal year $t$

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All the variables are measured in thousand units of local currency.

## TABLES

### Table 1 Descriptive Statistics and Coloration Matrix

		MV	BV	Earnings	CFO	ACC	CAPEX	EX
All Obs. 9760	Mean	0.6512	0.4376	0.0627	0.0839	-0.0212	0.0565	0.0003
	S.D	0.5115	0.2753	0.0812	0.0819	0.0795	0.0579	0.0006
	Min	0.0005	-3.1259	-1.3057	-1.1644	-0.7047	-0.0218	-0.0028
	Max	20.1425	7.1466	1.0435	0.7490	1.8270	1.7450	0.0295
France Obs. 1747	Mean	0.5744	0.3877	0.0583	0.0799	-0.0216	0.0486	0.0003
	S.D	0.3749	0.1653	0.0594	0.0644	0.0695	0.0399	0.0005
	Min	0.0005	-0.3503	-0.1810	-0.2435	-0.4982	0.0005	-0.0005
	Max	2.6738	0.9168	0.4356	0.5566	0.3311	0.3576	0.0108
Germany Obs. 1784	Mean	0.5268	0.3518	0.0422	0.0828	-0.0406	0.0612	0.0003
	S.D	0.3931	0.1949	0.0840	0.0776	0.0821	0.0530	0.0003
	Min	0.0055	-0.7278	-0.5445	-0.3532	-0.5547	0.0007	-0.0003
	Max	3.0846	1.6326	0.4691	0.4971	0.3380	0.6094	0.0049
Sweden Obs. 735	Mean	0.6681	0.4203	0.0666	0.0859	-0.0193	0.0541	0.0003
	S.D	0.4497	0.2409	0.090	0.0907	0.0729	0.0578	0.0004
	Min	0.0067	0.0066	-0.4321	-0.5705	-0.4114	-0.0218	-0.0002
	Max	2.8274	2.9959	0.5758	0.5260	0.4697	0.9195	0.0070
UK Obs. 3319	Mean	0.8165	0.5281	0.0803	0.0874	-0.0071	0.0567	0.0002
	S.D	0.6688	0.3565	0.0968	0.0990	0.0921	0.0604	0.0003
	Min	0.0345	-3.1259	-1.3057	-1.1644	-0.7047	0.0001	-0.0028
	Max	20.1425	6.8515	1.0435	0.7490	1.8270	0.5948	0.0057
Netherland Obs. 629	Mean	0.6628	0.4292	0.0821	0.0988	-0.0166	0.0657	0.0003
	S.D	0.3546	0.1633	0.0543	0.0725	0.0739	0.0606	0.0004
	Min	0.0510	0.0321	-0.1508	-0.2042	-0.3446	0.0039	0.0000
	Max	2.0374	1.2281	0.2949	0.4397	0.3110	0.7309	0.0055
Denmark Obs. 670	Mean	0.5430	0.4222	0.0550	0.0769	-0.0220	0.0733	0.0003
	S.D	0.3881	0.2109	0.0667	0.0736	0.0666	0.0842	0.0004
	Min	0.0231	-0.0835	-0.2063	-0.2778	-0.3375	0.0009	-0.0000
	Max	3.060	2.3154	0.5281	0.5207	0.2915	0.9480	0.0045
Switzerland Obs. 877	Mean	0.5676	0.4117	0.0508	0.0825	-0.0317	0.0451	0.0008
	S.D	0.3611	0.1815	0.0543	0.0542	0.0554	0.0332	0.0016
	Min	0.0430	-0.1871	-0.1868	-0.0902	-0.3405	0.0009	-0.0003
	Max	2.5562	1.2708	0.2509	0.3330	0.2159	0.3195	0.0295

Panel B Pearson Correlation

	MV	EARNINGS	CFO	ACC	EX	BV
MV	1					
EARNINGS	0.31***	1				
CFO	0.16***	0.53***	1			
ACC	0.15**	0.48***	-0.49***	1		
EX	0.14***	0.08***	0.16***	-0.08***	1	
BV	0.61***	0.19***	0.08***	0.12***	0.02	1

Panel A shows descriptive statistics of variables used in the paper. All variables are defined in Appendix. Whole sample includes 10,333 observations with 1175 firms. Figures for 8 individual countries are also reported. S.D is standard deviation. Pearson correlations between variables have been reported in panel B. \*, \*\*, and \*\*\* denote significance of coefficients at the 10%, 5% and 1% level respectively, using a two tailed test.

**Table 2 The Impact of Mandatory Adoption of IFRS on Accounting Quality**

Panel A: Descriptive Statistics of Accounting Quality

	All	France	Germany	Sweden	UK	Netherland	Denmark	Switzerland
Mean	0.9621	0.9630	0.9511	0.9644	0.9688	0.9627	0.9606	0.9657
Standard Deviation	0.0382	0.0347	0.0378	0.0320	0.0412	0.0355	0.0345	0.0257
Min	0.0576	0.6661	0.6407	0.7012	0.0576	0.7386	0.7142	0.8036
Max	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
Number of Observation	9760	1747	1784	735	3319	629	121	670

Panel B: The Impact of Mandatory Adoption of IFRS on Accounting Quality

$$AQ_{j,t} = \gamma + \delta MD_{j,t} \quad (4)$$

	All	France	Germany	Sweden	UK	Netherland	Denmark	Switzerland
$\delta$	0.0031 (4.00***)	0.0038 (2.43***)	0.0036 (2.02**)	0.0010 (0.41)	0.0018 (1.16)	0.0058 (1.96*)	-0.0046 (-1.55)	0.0008 (0.45)
Number of observations	9760	1747	1784	735	3319	629	121	670

Panel A of Table 2 presents the descriptive statistics of accounting quality, which is defined by equation 1 and 2:

$$ACC_{j,t} = \theta_0 + \theta_1 CFO_{j,t-1} + \theta_2 CFO_{j,t} + \theta_3 CFO_{j,t+1} + \theta_4 \Delta Rev_{j,t} + \theta_5 PPE_{j,t} + \mu_{j,t} \quad (1)$$

$$AQ_{j,t} = 1 - |\mu_{j,t}| \quad (2)$$

All variables are defined in Appendix.

Panel B of Table 2 reports the results of equation 4. Robust t-statistics are in parentheses. \*, \*\*, and \*\*\* denote significance of coefficients at the 10%, 5% and 1% level respectively, using a two tailed test.

**Table 3 Market Value and Accounting Quality-Adjusted Earnings**

$$MV_{j,t} = \alpha + \beta_0 TA_{j,t}^{-1} + \beta_1 WE_{j,t} + \beta_2 WE_{j,t} * MD_{j,t} + \beta_3 WE_{j,t} * GDP_{j,t} + \beta_5 BV_{j,t} + \beta_6 BV_{j,t} * MD_{j,t} + \beta_7 EX_{j,t} + \varepsilon_{j,t}$$

		All	France	Germany	Sweden	UK	Netherland	Denmark	Switzerland
$TA^{-1}$	Coefficient $\beta_0$	1786.53 (2.91***)	3675.32 (3.48***)	2276.93 (1.15)	-5518.04 (-0.73)	1633.61 (2.28**)	904.10 (0.64)	2732.03 (0.19)	-15245.94 (-1.79*)
WE	Coefficient $\beta_1$	0.61 (4.03***)	-0.03 (-0.13)	0.36 (2.13**)	-0.09 (-0.26)	0.27 (0.97)	0.38 (1.16)	0.67 (2.57***)	0.28 (0.71)
WE*MD	Coefficient $\beta_2$	1.25 (4.46***)	0.66 (1.98**)	0.87 (4.67***)	1.09 (1.81**)	1.73 (4.95***)	1.04 (2.11**)	0.81 (1.73*)	1.00 (2.61***)
WE*GDP	Coefficient $\beta_3$	0.29 (11.80***)	0.44 (6.95***)	0.06 (1.60)	0.24 (5.36***)	0.45 (8.45***)	0.45 (9.95***)	0.15 (1.81*)	0.38 (5.49***)
BV	Coefficient $\beta_4$	0.79 (8.06***)	0.99 (7.54***)	0.96 (7.09***)	0.86 (4.64***)	0.83 (7.42***)	1.02 (7.77***)	0.64 (6.21***)	0.94 (6.43***)
BV*MD	Coefficient $\beta_5$	-0.09 (-1.29)	0.02 (0.35)	-0.02 (-0.34)	-0.15 (-1.06)	-0.11 (-1.63)	0.06 (0.54)	0.21 (2.80***)	-0.04 (-0.45)
EX	Coefficient $\beta_6$	73.50 (3.36***)	56.56 (1.93*)	240.04 (5.39***)	236.23 (5.16***)	425.32 (6.63***)	127.30 (1.47)	206.99 (4.26***)	14.95 (2.11**)
constant	$\alpha$	0.17 (4.02***)	0.08 (1.71*)	0.06 (1.62)	0.21 (3.04***)	0.11 (1.95*)	0.02 (0.40)	0.13 (3.91***)	0.15 (3.05***)
No. of observations		9760	1747	1784	735	3319	629	670	877
No. of firms		1175	205	199	85	397	71	64	92
R <sup>2</sup>		45.41	45.51	61.43	53.12	40.73	54.12	53.07	49.61

Table 3 shows estimation results of equation 3. All variables are defined in Appendix. The sample comprises firm-year observations of 8 countries in the EU between 1993 and 2011. We base the analysis on industry fixed firm and year effect regression. Robust t-statistics are in parentheses. \*, \*\*, and \*\*\* denote significance of coefficients at the 10 %, 5% and 1% level respectively, using a two tailed test.

**Table 4 Market Value and Accounting Quality-Adjusted Earnings Components**

$$MV_{j,t} = \gamma + \delta_0 TA_{j,t}^{-1} + \delta_1 CFO_{j,t} + \delta_2 CFO_{j,t} * GDP_{j,t} + \delta_3 CFO_{j,t} * MD_{j,t} + \delta_4 WACC_{j,t} + \delta_5 WACC_{j,t} * MD_{j,t} + \delta_6 BV_{j,t} + \delta_7 BV_{j,t} * MD_{j,t} + \delta_8 EX_{j,t} + \mu_{j,t}$$

		All	France	Germany	Sweden	UK	Netherland	Denmark	Switzerland
$TA^{-1}$	Coefficient $\delta_0$	2161.29 (3.69***)	3146.16 (3.27***)	1981.84 (1.10)	-4435.76 (-0.51)	1984.77 (3.08***)	984.26 (0.59)	724.60 (0.05)	-14805.45 (-1.71*)
CFO	Coefficient $\delta_1$	0.43 (1.92*)	-0.27 (-1.24)	0.44 (2.73***)	-0.11 (-0.35)	0.08 (0.21)	0.44 (1.26)	0.49 (2.30**)	0.30 (0.84)
CFO*GDP	Coefficient $\delta_2$	0.21 (12.83***)	0.44 (10.86***)	0.05 (2.29**)	0.21 (5.66***)	0.34 (6.41***)	0.29 (8.56***)	0.11 (1.75*)	0.23 (4.74***)
CFO*MD	Coefficient $\delta_3$	1.28 (3.39***)	0.34 (0.96)	0.70 (3.46***)	0.80 (1.24)	1.64 (3.44***)	0.82 (1.45)	0.35 (0.77)	1.34 (3.39***)
WACC	Coefficient $\delta_4$	1.22 (5.71***)	0.65 (2.94***)	0.42 (2.40**)	0.33 (1.09)	1.59 (4.53***)	1.52 (4.15***)	0.97 (4.54***)	0.90 (2.22**)
WACC*MD	Coefficient $\delta_5$	0.76 (3.37***)	0.20 (0.72)	0.86 (4.22***)	1.25 (2.46**)	0.91 (2.24**)	0.63 (1.13)	0.41 (0.88)	0.49 (1.17)
BV	Coefficient $\delta_6$	0.82 (8.77***)	1.02 (7.82***)	0.94 (7.28***)	0.81 (4.33***)	0.86 (7.74***)	1.03 (7.45***)	0.64 (6.01***)	0.97 (6.55***)
BV*MD	Coefficient $\delta_7$	-0.11 (-1.31)	0.09 (1.22)	0.02 (0.31)	-0.06 (-0.42)	-0.14 (-1.51)	0.10 (0.73)	0.28 (3.22***)	-0.11 (-1.16)
EX	Coefficient $\delta_8$	73.82 (3.37***)	77.87 (2.36**)	233.20 (5.33***)	255.88 (5.96***)	422.48 (6.18***)	137.55 (1.61)	215.69 (4.58***)	13.49 (2.02**)
Constant	$\gamma$	0.18 (4.40***)	0.09 (1.77*)	0.06 (1.68*)	0.23 (3.27***)	0.13 (2.05**)	0.05 (0.89)	0.15 (3.88***)	0.16 (3.35***)
No. of observations		9760	1747	1784	735	3319	629	670	877
No. of firms		1175	205	199	85	397	71	64	92
R <sup>2</sup>		44.62	46.51	61.80	53.16	39.53	55.02	52.52	49.08

Table 4 shows estimation results of equation 5. All variables are defined in Appendix. The sample comprises firm-year observations of 8 countries in the EU between 1993 and 2011. We base the analysis on industry fixed firm and year effect regression. Robust t-statistics are in parentheses. \*, \*\*, and \*\*\* denote significance of coefficients at the 10%, 5% and 1% level respectively, using a two tailed test.