MANDATORY ADOPTION OF IFRS AND ANALYSTS' FORECASTS INFORMATION PROPERTIES

By Christof Beuselinck, Philip Joos,
Inder K. Khurana, Sofie Van der Meulen

TILBURG ◆ UNIVERSITY

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Christof Beuselinck [#]
Tilburg University and CentER

Philip Joos
Tilburg University and TiasNimbas Business School

Inder K. Khurana
University of Missouri-Columbia

Sofie Van der Meulen
Tilburg University and CentER

Current draft: September 30, 2010

[#] Corresponding author: Christof Beuselinck Department of Accountancy and CentER, Tilburg University, 5000 LE Tilburg, The Netherlands. C.beuselinck@uvt.nl. T: +31 13 466 2682.

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Abstract: This study examines the properties of the information contained in analysts' earnings forecasts for mandatory IFRS adopters in Europe for the period 2003-07. We find a significant increase in the precision of both *public* and *private* information after switching to IFRS, especially for forecasts pertaining to 2006 and later. However, we are unable to detect a change in the consensus among financial analysts after the mandatory adoption of IFRS. These results suggest that the higher percentage increase in the precision of common information is offset by a proportionate increase in the precision of private information such that consensus among analysts does not change. When exploring analyst-specific precision in more detail, we find that the analysts who are following firms in more than one European country experience the largest post-IFRS improvement in private information precision. These results hold after controlling for factors that are shown in prior research to be correlated with analysts' information precision measures. Taken together, our results suggest that mandatory adoption of IFRS had a significant and positive effect on the information processing of financial analysts but this did not occur homogeneously across analysts.

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1. Introduction

In the last decade, more than 110 countries around the world adopted International Financial Reporting Standards (IFRS) as their official accounting standards. A large fraction of all firms that report under IFRS are domiciled in Europe. In its Regulation No. 1606/2002, the European Commission identifies enhanced comparability and increased transparency as important objectives that should be reached via mandatory IFRS adoption for all listed firms starting from fiscal year 2005. One way to study how the orchestration of such a large-scale, contemporaneous financial reporting switch contributes to these objectives is by studying the effect on financial analysts' information.[1] Mandatory adoption of IFRS can have a direct effect on not only the information that is common across all financial analysts but also on the information that is idiosyncratic (uniquely private) to individual analysts. In other words, the precision of both common and idiosyncratic information can change after the adoption of IFRS. In this study, we empirically evaluate whether and how the mandatory adoption of IFRS in Europe altered the public and private information properties contained in analysts' earnings forecasts.[2]

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[1] Prior research has identified financial analysts as an important set of expert information intermediaries. See Schipper (1991), Brown (1993), and Ramnath et al. (2008) for literature reviews describing the role of financial analysts in capital markets.

[2] In this paper, we use the term IFRS to refer to all standards issued by the International Accounting Standards Committee or the committee's successor, the International Accounting Standards Board, even though the standards issued by the former are typically referred to as International Accounting Standards (IAS). Moreover, to vary the exposition in the paper, we refer to public information as common information and private information as idiosyncratic information.

Evidence on the effect of IFRS adoption on the information common to all analysts and the information idiosyncratically inferred by individual analysts is related to, but distinct from evidence on the properties of realized forecasts such as forecast accuracy. Prior literature has primarily focused on the changes in forecast properties after the mandatory adoption of IFRS and documented that forecast accuracy, analyst following, and analyst dispersion improve after the mandatory adoption of IFRS for a subset of firms from a subset of EU countries (Horton et al. 2009; Byard et al. 2010). However, forecast accuracy is a function of the precision of public and private information, both of which have been shown in prior research to be associated with cost of equity capital (Botosan et al. 2004). To the extent mandatory IFRS adoption triggered private information acquisition, outcomes of forecast precision cannot provide unambiguous inference about changes in the information environment. Tests on how mandatory IFRS adoption affected the *precision of public and private information* provide more direct evidence on the channels by which mandatory IFRS adoption affects analyst behavior and can help sort out the source of the effects of mandatory IFRS adoption.

To measure quality of information, we use the information precision measures that were first developed by Barron et al. (1998; hereafter BKLS). These measures are based on the assumption that analysts' earnings forecasts reflect both public information shared by all analysts and private information available only to individual analysts. We first measure separate empirical proxies for the precision of public and private information from the observed forecast dispersion, error in the mean forecast, and number of analysts, and then use these estimates to derive a consensus measure to capture the proportion of the precision of analyst's common information to the precision of their

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total information. We then use an interrupted time-series design to investigate the patterns in the information properties contained in analysts' forecasts for the year 2005 when IFRS was mandated in the European Union (EU) for listed enterprises and for the post-adoption years (2006-2007), all relative to pre-IFRS years (2003-2004).

Using a sample of 1,364 mandatory IFRS adopters (4,530 firm-year observations) in 16 EU countries (i.e., the EU15 countries excluding Luxembourg, plus Norway and Switzerland) for the period 2003-2007, we find that mandatory adoption of IFRS triggered a significant increase in the precision of common information when forecasting 2005 earnings, the first year of full-IFRS compliant reporting, as well as in the post-IFRS adoption period covering the years 2006 and 2007. Moreover, we find an increase in the precision of private information, although the increase is only statistically significant at conventional levels in the post-IFRS adoption period. These results hold after controlling for factors that are shown in prior research to be correlated with analysts' information precision measures. In addition, we show that post-IFRS improvements in precision are not driven by earnings management to "meet or beat" analysts' expectations. Overall, our results are consistent with the view that the precision of public and private information complemented each other after the first mandatory full-IFRS reports were published for EU firms.

Despite the observed changes in the precision of public and private information, we are unable to detect a change in the consensus among financial analysts after the mandatory adoption of IFRS. This absence of a detectable change in the consensus among financial analysts suggests that the higher percentage increase in the precision of common information is offset by a proportionate increase in the precision of private information such that consensus among analysts does not change.

To rule out the possibility that our results may be driven by some time-varying factor, we replicate our results for a sample of U.S. firms that were not required to adopt IFRS during the 2003-2007 period. Our sample of U.S. firms does not exhibit an increase in the precision of private or public information nor in consensus among analysts for 2005 or later earnings. These out-of-sample benchmark results provide some confidence that our results for mandatory IFRS adopters in EU countries are not driven by a time-varying omitted variable. To further substantiate that our results are due to mandatory IFRS adoption effects, we partition our sample based on the 2004 IFRS-local GAAP earnings per share reconciliation amounts. Consistent with our expectations that information improvements are largest where IFRS affects firms' reporting most, we document that IFRS adoption yields larger improvements in precision of public and private information for firms with larger reconciliation adjustments.

Finally, we use the more generalized information measures developed by Gu (2005) to relax the assumption of equal precision of private information across all analysts in BKLS. This feature of our study enables us to focus on the individual analysts as opposed to aggregate (i.e., consensus or average) measures of forecasts for all analysts following a particular company, and to control for the individual characteristics of analysts. Consistent with the argument that IFRS enhances across country comparability, we find that especially analysts who follow firms from more than one country experience the largest post-IFRS improvement in private information precision. Moreover, the results indicate that the findings reported in this paper using the aggregated measures in BKLS (1998) are robust.

Overall, our paper documents changes in analysts' reporting environment following the mandatory switch to IFRS. With this research, we contribute to two

streams of literature: the literature on the consequences of mandatory IFRS adoption and the literature on analysts' reactions to changes in disclosure. Recent empirical research on mandatory IFRS adoption and analysts' forecasts provides evidence that the information environment in the form of forecast accuracy and dispersion improved in the post-FRS period for a subset of firms from certain countries (e.g., Byard et al. 2010; Horton et al. 2009). Our paper sheds light on how analysts use the information set under IFRS in forecasting earnings. Specifically, our results indicate that mandatory adoption of IFRS not only increased the precision of information that is common across all analysts but also aided particular analysts' abilities to develop idiosyncratic insights from public disclosure. Moreover, our results highlight the importance of isolating the learning effects by distinguishing the time period when firms produced their first IFRS-compliant information and later years following the first IFRS-compliant financial statements.

Our study also contributes to research on regulatory reforms affecting analysts' information environment. Prior studies are primarily based on US data and have, for example, examined the implementation of Regulation Fair Disclosure (Reg. FD) in 2000 (Srinidhi et al. 2009), the Global Research Analyst Settlement of 2002 (Kadan et al. 2009), and the 2002 Sarbanes-Oxley Act (Begley et al. 2009).[3] The general tenor of these studies is that analysts experience only a temporary information quality increase following the reform, if any. In the current study, we look at a significant accounting

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[3] Both Reg FD and Global Research Analyst Settlement affected analysts' activities directly: Reg FD eliminated all private or selective communication between firm management and preferred analysts, and the Global Settlement reform set out restrictions on analyst certification and activity type. Sarbanes-Oxley Act (SOX), which aimed at improving the accuracy and reliability of corporate disclosure, primarily affected the (public) information set available to analysts. Because SOX and Global Settlement were developed in unison and implemented in the same year, it is not feasible to isolate and examine the effects of just the financial reporting reform.

reform in a non-US context. Our results are consistent with IFRS introducing a sustained improvement in the precision of both public and idiosyncratic information.

The remainder of the paper proceeds as follows. The next section discusses prior research and derives testable prediction. In section 3, we address research design issues and sample selection. Section 4 reports summary statistics and empirical evidence. Section 5 concludes the paper.

2. Related Literature and Testable Predictions

2.1 Prior Research on the Association between Public and Private Information

How financial disclosure affects investors' public and private information has been the subject of extensive prior research. In his analysis of how disclosure rules affect public and private information production decisions, Gonedes (1980) argues that the effectiveness of disclosure rules cannot be assessed independently of private information-production activities if there exists a substitutive (or complementary) relationship among the signals produced on private account and those covered by disclosure rules. Consequently, empirical evidence dealing with the effects of new disclosure rules should reflect both the direct (public) effects of the rules on produced information and the indirect effects of any changes in private information production activities.

There are two competing views that exist on the relation between public and private information. One view posits a substitutive relation between public and private information (Verrecchia 1982). The argument here is that more publicly available information lessens the amount of costly private inquiry. To the extent that more public information is available, it decreases not only the investor demand for analyst coverage but also the benefits for analysts in general. An alternative view predicts a positive (complementary) relation between public and private information (Kim and Verrecchia

1994, 1997). The argument here is that analysts primarily would interpret information in a way than complements public announcements (Lang and Lundholm 1996; Francis et al. 2002). Thus, public disclosure can reduce analysts' forecasting costs and in turn increase the supply of forecasts. In other words, more public information increases private information.

In addition to the interaction that takes place between public and private information, analytical studies have also focused on the association between the precision of public and private information. For example, Kim and Verrecchia's (1991) model suggest that an increase in the precision of public information leads to more precision in private information because more informed investors increase the precision of their private information to a greater extent than less informed investors. Empirical evidence on this issue suggests a complementary effect. Barron et al. (2002a) show that the precision of private information increases around earnings announcements and that the absolute increases in the precision of common information are larger than the increases in the precision of idiosyncratic information. Byard and Shaw (2003) find that higher quality disclosures increase the precision of analysts' common and idiosyncratic information. In a similar vein, Botosan and Stanford (2005) examine segment disclosures required by Statement of Financial Accounting Standards (SFAS) No. 131 and find that analysts responded to the change in their information environment by increasing their reliance on the public information that became available under SFAS No. 131.

2.2 Prior Research on Mandatory IFRS Adoption

A number of studies have examined the capital-market effects of mandatory IFRS adoption in EU and other countries. In their review of this stream of work, Hail et al.

(2009) conclude that that there is some evidence of positive capital market outcomes around IFRS adoption by firms around the globe. The evidence from this line of research, while important, is indirect and limited because studies in this area focus on market aggregates without linking them directly to users of financial statement information. As a consequence, there is limited evidence on whether mandatory adoption of IFRS triggered significant idiosyncratic information.

More recent research has begun to focus on a major set of users of accounting information, namely financial analysts. Horton et al. (2009) examine how mandatory IFRS adoption in sixteen EU countries affected analysts forecast accuracy, following, disagreement, and volatility of revisions. They find an improvement in the information environment only for non-financial firms that mandatorily adopted IFRS. They also find the largest benefits for mandatory adopters in industries with high proportion of early voluntary adopters, revealing a learning curve during IFRS adoption.

In contrast, Byard et al. (2010) find that relative to voluntary IFRS adopters, mandatory IFRS adopters in EU countries exhibit no significant change on average in analysts' forecast errors, forecast dispersion, or analyst following. However, they find significant decreases in both forecast errors and dispersion, and a weakly significant increase in analyst following for mandatory adopters domiciled in countries with both strong enforcement regimes and domestic accounting standards that differ substantially from IFRS. They also find significant increases in the precision of both analysts' public and private information for mandatory adopters domiciled in countries with both strong enforcement regimes and domestic accounting standards that differ significantly from IFRS. In summary, the research conducted to date indicates that mandatory IFRS

adoption improved firms' information environment for firms in particular industries and heterogeneously across EU countries.

We extend this research in several respects by examining the impact of mandatory IFRS adoption on aspects of analysts' information environments that remain unexplored in prior research. First, to isolate any learning effects, we distinguish between the year when firms produced their first IFRS-compliant information, and later years following first IFRS-compliant financial statements. Second, we do not use voluntary IFRS adopters as a control group because prior research (e.g., Hail et al. 2009) has questioned the use of this group as a control sample. For example, competitive disclosure can cause these firms to disclose more when IFRS adoption becomes mandatory. Moreover, the results could be attributable at least in part to innate firm characteristics that gave rise to the voluntary IFRS adoption decision in the first place. Instead, we use firms from the U.S. as a benchmark sample. Third, we also focus on *individual* analysts as opposed to aggregate (i.e., consensus or average) measures for all analysts following a particular company. Finally, we test whether earnings management to meet or beat analyst expectations drive the findings of information environment improvements, if any, in the post-IFRS era.

2.3 Testable Predictions

Anecdotal evidence and reports by Big Four auditing firms on IFRS implementation (e.g., KPMG 2006; Ernst & Young 2007; PwC/IPSOS Mori 2007) indicate far greater disclosure and improved comparability across firms as a result of IFRS. The first time mandatory adoption of IFRS in the EU in 2005 led to a significant increase in disclosed information because firms not only explained transition effects due to the use of IFRS but also disclosed more footnotes about segments, pensions, share-

based payments, and other transactions that were not required to be disclosed under local GAAP (e.g., Hall 2008; Hughes 2008). This view is also reflected in the US Securities and Exchange Commission's (2008) roadmap to mandatory IFRS adoption in the US, labeling IFRS as a high quality set of accounting standards.

Several studies also show that IFRS are more comprehensive than most domestic standards (e.g., Bae et al. 2008) and that IFRS adoption tends to enhance financial reporting quality (e.g., Covrig et al. 2007; Barth et al. 2008). As such, one could conceptualize the mandatory adoption of IFRS as a movement from a coarser to a finer information environment.[4] The concepts of finer information environment and precision are inextricably linked in that a finer information environment is likely to result in a more precise public information signal. To the extent that mandatory IFRS adoption indeed exhibits these characteristics, we formally state the first hypothesis as:

H1:   There is a significant increase in the precision of public information reflected in analyst forecasts following the mandatory adoption of IFRS.

The precision of private information (or the information only available to an individual analyst) can come either from their private communication with managers or from individual analytical skills and effort (Gu 2005). Mandatory IFRS adoption does not alter or limit the private communication with managers in the EU setting; analysts can still consult managers on accounting issues. Anecdotal evidence (e.g., Citigate 2005) further documents that private communication in fact increased, especially in the first implementation year and that analysts were requiring additional, private information on certain IFRS numbers or transition effects. Also, the variation across analysts regarding

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[4] Some researchers (e.g. Ball 2006) note that because IFRS is principles-based, it allows the exercise of more management judgment and greater flexibility in its application. In the context of our study, the implication is that weak country-level institutions can undermine the implementation of accounting standards, which in turn result in less credible financial reporting. We test this implication in section 4.7 of our paper.

technical capacities is likely to persist and to become even more important under IFRS; the switch to IFRS requires analysts to get familiar with new accounting rules and information, and get additional training. This suggests that analysts can still differentiate themselves from others, even more so than pre-IFRS. Moreover, the analytical model developed by Indjejikian (1991) suggests that when individual investors are equally informed and risk tolerant, the disutility from all investors becoming equally more informed by increased public disclosure increases investor demand for idiosyncratic interpretation of the disclosure. In the context of our study, mandatory adoption of IFRS is expected to increase the effort put in by analysts on their own idiosyncratic information gathering and analysis. In other words, mandatory adoption of IFRS is likely to increase the precision of private information. Formally stated, the second hypothesis is:

H2: **There is a significant increase in the precision of private information reflected in analyst forecasts following the mandatory adoption of IFRS.**

To the extent that private and public information sets vary in precision, two outcomes are possible. If the public information set increases more in precision than the private information set, then analysts' forecast consensus is likely to increase post-IFRS. Alternatively, if the public information set increases less in precision than the private information set, then analysts' forecast consensus is likely to decrease post-IFRS. The directional effect on consensus, however, remains an empirical issue. This results in our third hypothesis, which is formally stated as:

H3: **There is a change in analysts' forecast consensus following the mandatory adoption of IFRS.**

3. Sample and Research Design

3.1 Sample

Our initial sample consists of all firms that (1) were domiciled in one of the 16 EU countries (EU15 countries minus Luxembourg, plus Norway and Switzerland) which required by law the switch to IFRS for listed firms as of fiscal year 2005, (2) have December 31 fiscal year-ends[5], (3) have annual EPS data available from the I/B/E/S actual earnings announcement file, and (4) have at least two non-stale one-year ahead analyst EPS forecast (FPE1) on the I/B/E/S database.[6] We select forecasts of one-year ahead annual earnings made within three months after the prior year's annual earnings announcement by analysts who also forecasted and/or updated one-year ahead annual earnings within six months prior to the current year's earnings announcement date for that same firm (i.e., are non-stale by nature). Selection of these forecasts ensures that forecasts are conditioned on the same publicly disclosed information set. The choice of relatively 'early' forecasts is especially warranted in a mandatory IFRS setting because prior research by Christensen et al. (2009) documents cross-sectional variation in the timing of information dissemination during the IFRS transition years, which has the potential for affecting the variance in public information of later forecasts from that of interim, IFRS-related news.[7] We select the forecast closest to prior year's earnings

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[5] We limit our analysis to firms with December fiscal year-end to facilitate cross-sectional comparison.

[6] The requirement that earnings forecasts are available from at least two analysts for each earnings announcement is necessary for computing forecast dispersion measures.

[7] Note, however, that our results remain unaffected when we select forecasts from 3, 4 or 6 months before the current year's earnings announcement (results available upon request). We also applied various sensitivity checks to the selection of staleness periods: 6 months before and 6 months after the earnings announcement date; 3 months before and 3 months after the earnings announcement date; and 4 months before and 4 months after the earnings announcement date. All results remain qualitatively unchanged for these alternative definitions of staleness periods.

announcement date in cases where more than one forecast is available from the same individual analyst.

Because the focus of this study is on the effects of mandatory IFRS adoption, we delete firms that voluntarily adopted IFRS prior to 2005 or adopted IFRS only after 2007 (such as AIM firms on the London Stock Exchange).[8] We also require availability of sufficient data on Datastream to compute the financial data items and stock market data used in the empirical tests. This screening process results in 9,856 analyst-year and 4,530 firm-year observations (1,364 unique firms).[9] To benchmark the results for the EU firms, we also identify a U.S. sample of 11,710 analyst-year and 9,976 firm-year observations (3,158 unique firms). Panel A and B of Table 1 summarize the sample selection procedures for EU and U.S. firms, respectively.

[Insert Table 1]

3.2 Research Design

We use an interrupted time-series design to investigate the patterns in the properties of the information contained in analysts' earnings forecasts. Information properties are based on analysts' earnings forecasts issued in the 3 months immediately after prior year's earnings announcement. For example, the information metrics for 2005 are measured using analyst earnings forecasts issued during the 3 months after the 2004

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[8] In unreported analyses we include additional requirements with respect to the minimum number of years that an analyst following a firm should be represented in the sample. Requiring at least 4 years (out of 5) of observations per firm reduces the sample size (firm-years) to 669 firms (3,163 firm-years) but does not affect the conclusions of our analyses.

[9] Sample composition by country (in alphabetical order) is as follows: Austria (31), Belgium (153), Denmark (139), Finland (306), France (629), Germany (327), Greece (124), Ireland (46), Italy (381), the Netherlands (355), Norway (265), Portugal (53), Spain (300), Sweden (444), Switzerland (130), and the UK (847). Industries are fairly well represented in the final sample. Largest number of observations (about 22.3 percent) belong to SIC code 3 (Manufacturing). The least number of observations (about 4.7 percent) are from SIC code 8 (Services other than Entertainment, Food and Accommodation).

fiscal-year earnings announcement. Forecasts that relate to earnings of fiscal year 2005 (ADOPT), the year when IFRS was mandated in EU for listed enterprises, are compared to earnings forecasts for the Pre-IFRS adoption period (2003, 2004). Similarly, earnings forecasts for 2006 and 2007 (POSTADOPT), the years reflecting the Post-IFRS adoption period, are compared to earnings forecasts for the Pre-IFRS adoption period (2003, 2004).[10] For our multivariate analyses, we use the following model to test properties of analysts' information environment around mandatory IFRS adoption:

$$INF_{i,t} = \alpha_0 + \beta_1 ADOPT_i + \beta_2 POSTADOPT_i + \beta_3 Log(MV)_{i,t} + \beta_4 MTB_{i,t} + \beta_5 RD_{i,t}$$

$$+ \beta_6 NUMANAL_{i,t} + \beta_7 AVG\_PREDLAG_{i,t} + \beta_7 PROP\_LATE_{i,t}$$

$$+ \gamma_j \sum IND_j + \theta_c \sum CNTRY_c + \varepsilon_{i,t} \qquad (1)$$

where:

INF	=	properties of the information contained in analysts' earnings forecasts for firm i and fiscal year t
ADOPT	=	dummy variable equal to 1 if a firm observation is from fiscal year 2005 (mandatory IFRS adoption year) and 0 otherwise
POSTADOPT	=	dummy variable equal to 1 if a firm observation is from 2006 or 2007 fiscal year (post-mandatory IFRS adoption years) and 0 otherwise
MV	=	the market value of equity of the firm at fiscal year-end [Source: Datastream]
MTB	=	market-to-book ratio at fiscal year-end [Source: Datastream]
RD	=	average research & development expense in the post-IFRS (2006 and 2007) period [Source: Datastream][11]

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[10] We separate the IFRS transition year (2005) from later years (2006 and 2007) to enable us to isolate the 'learning' effects associated with the new reporting standards. This learning effect would predict a more pronounced improvement in information properties in the period after the first full-IFRS compliant reports, i.e., for metrics labeled as 2006 and later.

[11] We average the research and development expenditures over the post-IFRS period because Nobes (2001) reports different accounting rules for capitalization of R&D in EU countries in the pre-IFRS time-period. However, our inferences are not sensitive to the measurement of this variable.

NUMANAL   =   the number of unique analysts that issue at least one EPS forecast during the 3-month period following prior year's earnings announcement [Source: I/B/E/S]

AVG_PREDLAG=   average number of days between previous year's earnings announcement and an analyst's initial EPS forecast that was initiated within 3 months after prior year's earnings announcement [Source: I/B/E/S]

PROP_LATE   =   number of one-year ahead EPS forecasts not initiated within 3 months after prior year's earnings announcement expressed as a fraction of all one-year ahead EPS forecasts issued during the fiscal year [Source: I/B/E/S]

IND   =   Industry-fixed effects (based on one-digit SIC codes)

CTRY   =   Country-fixed effects

For the test of our hypotheses H1 to H3, we focus on three properties of the information contained in analysts' earnings forecasts: precision of public information; precision of private information; and analysts' forecast consensus. Specifically, we use model (1) to regress these information properties on the test variables ADOPT (2005 dummy) and POST_ADOPT (2006-07 dummy) and a set of control variables including firm characteristics, and industry and country fixed effects. All variables in model (1) are discussed in more detail below.

In the absence of a theoretical basis for predicting whether the relation between our dependent variables and independent variables is linear, we follow Barron et al. (2002b) and transform the dependent and independent variables into standardized rank (0,1) variables and use them in estimating model (1) as an ordinary least squares regression.[12]

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[12] Results based on alternative regression specifications where we include log transformations of the standardized ranked values – where the log transformation of each dependent variable X equals

3.2.1 Dependent Variable

To measure the properties of analysts' information environment, we follow prior studies by Barron et al. (2002a; 2002b) who use the methods initially developed by BKLS to derive empirical proxies. BKLS build a model to derive the unobservable properties of the information environment from the observable properties of analyst forecasts. In this model, each analyst observes two signals about future earnings u: a common prior shared by all analysts that u is normally distributed with mean $\bar{u}$ and precision (inverse of variance) h; a private signal $z_a = u + e_a$ available only to analyst a, where e_a is normally distributed with mean zero and precision s_a, and independent of all other information. Analyst a will make a forecast of future earnings based on her expectation and conditional on her two signals, $F_a = (h\bar{u}+s_a z_a)/(h+s_a)$. Variance of her forecast error is $V_a = 1/(h+s_a)$. Assuming multiple forecasts, BKLS further show that under the assumption of identical s_a's across all analysts (= s), h and s can be computed as a function of the observable, ex-post realized dispersion and error in mean forecast, namely as:[13]

$$h = \frac{SE - \dfrac{D}{N}}{\left[\left(1 - \dfrac{1}{N}\right)D + SE\right]^2} \tag{2}$$

$\psi = \log(\dfrac{stdrank[X]}{1 - stdrank[X]})$ and creates a continuous variable out of an originally (0-1) bounded variable – yield similar results.

[13] In order to calculate dispersion and mean forecasts, we required at least two analysts forecasting each earnings number. The requirement of identical s_a's across analysts is relaxed in section 4.6 following Gu (2005).

$$s = \frac{D}{\left[\left(1 - \frac{1}{N}\right)D + SE\right]^2} \qquad , \tag{3}$$

where D represents the dispersion among the forecasts of a firm and is equal to

$\frac{1}{N-1}\sum_{i=1}^{N}\left(F_i - \overline{F}\right)^2$, SE is the squared error in the mean forecast of a firm and is equal to

$\left(A - \overline{F}\right)^2$, F_a is the forecast by analyst a, $\overline{F}$ is the mean forecast, A is the actual earnings

realization, and N is the number of analysts issuing forecasts. Both D and SE are scaled

by absolute actual earnings A.[14] Using actual forecasts and earnings to estimate the

unobservable precision properties however implies that SE – D/N can be smaller than 0,

resulting in negative precision of common information. Following prior studies (Barron

et al. 2002a; Begley et al. 2009), we restrict h to be positive by including only SE in the

numerator in those cases.[15]

We also compute the BKLS correlation measure (ρ) which is a measure of the

across analyst correlation in forecast errors. Specifically, this correlation represents the

degree of consensus among analysts and captures the ratio of the precision of analysts'

common information to the precision of their total information. That is ρ = h/(h+s).

Empirically, the BKLS consensus measure can be computed using the same observable

features of analysts' forecasts, as follows:

$$\rho = \frac{SE - \frac{D}{N}}{\left(1 - \frac{1}{N}\right)D + SE} \tag{4}$$

To ensure comparability of our study with prior studies on mandatory IFRS adoption and analyst information properties, we also use dispersion and the squared error in the mean forecast (SE) as dependent variables in model (1).

3.2.2 Test Variables

The use of IFRS was made mandatory for all fiscal years commencing on or after January 1, 2005 for all listed firms in the European Union (Deloitte 2005).[16] In the regression model (1) we introduce two indicator variables, ADOPT and POSTADOPT. ADOPT refers to fiscal year 2005 or the year in which all listed-firms in Europe were required to adopt IFRS; POSTADOPT refers to the years after 2005. Both variables are introduced as main effect variables to capture information effects of mandatory IFRS adoption relative to the pre-period covering fiscal years 2003 and 2004.

3.2.3 Control Variables

Following prior research, model (1) includes several control variables previously shown to be related to the properties of analysts' information (e.g., Barron et al 2002b). We include market value of equity (MV) to control for a firm's size and its associated effects on the properties of analysts' information. King et al. (1990) argue that information acquisition is less costly for large firms, which increases the incentives of investors and financial analysts to acquire private information for these firms. Prior empirical research has shown a positive relation between firm size and the quantity of information available to investors.

We also include market-to-book ratio (MTB) as a control for variations in a firm's growth opportunities. Prior research (e.g., Bhushan 1989) has shown that growth firms

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[16] There are exceptions to this rule in that firms listed on less regulated markets (for instance the Alternative Investment Market [AIM] in London) or firms reporting non-consolidated reports have the option to postpone the first IFRS year to fiscal year 2007.

tend to have higher analyst following, suggesting greater demand for private information for high-growth firms. Barron et al. (2002b) show that analyst consensus is negatively related to the degree to which a firm is comprised of intangibles, indicating that forecasts of earnings for high intangible firms contain a high proportion of private information. Given that research and development expenditures represent internally generated intangibles, we include the natural log of research and development expenditures (RD) as an additional control variable.

To control for any differences in BKLS measures arising from the number of non-stale forecasts used for estimation purposes, we include three additional control variables.[17] *NUMANAL* is the number of unique analysts that issue at least one forecast during the 3-month period following prior year's earnings announcement. *AVG_PREDLAG* is the average number of days between prior year's earnings announcement and an analyst's initial EPS forecast that was initiated within 3 months after previous year's earnings announcement. Finally, *PROP_LATE* are the one-year ahead EPS forecasts that are not initiated within the 3 month period after prior year's earnings announcement, expressed as a fraction of all one-year ahead EPS forecasts issued during the calendar year. We include industry fixed effects (IND) based on one-digit SIC codes to control for any relation between informational properties and the industry to which a firm belongs. Moreover, we include country-fixed effects (CNTRY) to control for the impact of cross-country difference in explaining our information environment variables.

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[17] The staleness period starts from 90 days (3 months) after the previous year's earnings announcement date.

4. Empirical Results

4.1 Summary Statistics

Table 2 provides univariate analyses of analysts' information environment properties for the whole EU market to highlight their evolution over three distinct time periods. Period 1 refers to forecasts on fiscal years 2003 and 2004 when IFRS adoption was not mandatory. Period 2 covers forecasts for the fiscal year 2005 when mandatory IFRS adoption became effective and firms produced their first IFRS-compliant information; and period 3 refers to forecasts on the fiscal years following first IFRS-compliant financial statements (i.e., 2006 and 2007).

[Insert Table 2]

The precision of both common (h) and idiosyncratic (s) information exhibit an increase over time. For the whole EU market, the median level of h starts out at 4.88 in pre-IFRS time period (period 1), increases to 6.61 for the 2005 year-end forecasts (period 2), and 11.94 in post-IFRS adoption time period (period 3). The median level of s increases from 2.09 in period 1 to 2.89 in period 2 and then to 5.77 in period 3. Unreported test statistics show a statistically significant increase in h and s over time. On a univariate basis, these results suggest that the precision of both common and idiosyncratic information increases around the mandatory adoption of IFRS and is most pronounced for the later full-IFRS compliant years (i.e., fiscal years 2006 and 2007).

In contrast, the BKLS correlation measure (ρ), which captures the across-analyst correlation in forecast errors, declines over time. Recall that the theoretical value of ρ ranges between zero and one, where zero indicates that the information contained in individual forecasts is entirely idiosyncratic, and one indicates that all forecasts are the same. The median level of ρ is 0.74 in period 1, increases to 0.75 in period 2, and then

reduces to 0.72 in period 3. However, unreported test statistics indicate that the magnitude of the decline is not statistically significant. Moreover, dispersion and squared error in mean forecast, the two measures used in deriving the information properties, exhibit a decline over time. That is, forecasts become more accurate under IFRS and there are smaller forecast differences among analysts.

Panel A and B of Table 3 contain the summary statistics for selected firm-level variables used in our regression models for the EU and US sample, respectively. The median firm in our EU sample has a market value of equity of 970 million Euros and has a market-to-book ratio of 2.23. Fewer than fifty percent of the firm-year observations incur research and development expenditures. Further, for the median firm in our sample there are five one-year-ahead EPS forecasts made by unique analysts within three months after the previous year's earnings announcement. For these *early* forecasts (i.e., made within 3 months), the average number of days between previous year's earnings announcement and the new one-year ahead forecast is 30 days. Moreover, for the median firm, about 55 percent of all one-year ahead forecasts are made after this 3 month estimation period (i.e., are *late* forecasts). On average, the US firms in our sample are larger in size than the EU firms. For these US firms, analysts also take less time to issue a new one-year ahead forecast after a prior years' earnings announcement and analysts issue less late one-year ahead forecasts.

[Insert Table 3]

4.2 Correlations

Table 4 reports Spearman correlation of variables used in our regressions for the EU sample.[18] The precision of analysts' common information (h) is positively correlated (0.54) with the precision of analysts' idiosyncratic information (s). Consistent with its definition, the BKLS measure of consensus (ρ=h/(h+s)) is positively correlated with the precision of common information (0.10) and negatively with the precision of private information (-0.73). Moreover, precision of common and idiosyncratic information exhibit high correlations with dispersion (D; -0.77 and -0.28 respectively) and squared error in analysts' mean forecast (SE; -0.57 and -0.92 respectively). Finally, the high correlations between the information metrics and many of the control variables suggest that it is important to control for these factors in assessing the effects of IFRS adoption on these metrics. To examine whether the correlations among control variables are problematic in regression estimations, we diagnose multicollinearity in the regressions using variance inflation factors (VIFs). Overall, these VIFs are low, suggesting that collinearity is unlikely to be a significant issue in interpreting the regression results.

[Insert Table 4]

4.3 Regression Results

Panel A of Table 5 reports regression results for model (1) using five dependent variables: precision of common information (h), precision of idiosyncratic information (s), across-analyst correlation (consensus) in forecast errors (ρ), dispersion (D), and mean squared error in analysts' forecasts (SE). We include industry fixed effects (one-digit SIC codes) and country fixed effects but do not report coefficients for brevity reasons.

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[18] For brevity, we do not tabulate the spearman correlations for the U.S. sample. Pair-wise correlations for the US sample exhibit patterns similar to those for the EU sample.

The tests of significance reported in Table 5 are based on robust *t*-statistics that are clustered at the firm level (Petersen 2009). The explanatory power of model (1) for the five dependent variables ranges between 0.064 and 0.194.

[Insert Table 5]

For each of the dependent variables, the coefficients on the main effects of ADOPT and POSTADOPT are of interest. In the column labeled (1) where the precision of common information (h) is the dependent variable, the coefficient on ADOPT (0.022; $p<0.05$) indicates that precision of common information increased in the year of IFRS adoption. The coefficient on POSTADOPT in column (1) equals 0.105 ($p<0.01$), which suggests that the precision of common information in the POSTADOPT period (i.e., after 2005) substantially increased, after controlling for all other factors affecting precision of common information. Taken together, these results suggest that precision of common information increased from the moment of, and especially after the first year of the mandatory adoption of IFRS.

The results in column (2) indicate that the precision of idiosyncratic information (s) does not change for forecasts relating to the first year of mandatory adoption. However, the precision of idiosyncratic information (s) increased in the years after the mandatory adoption of IFRS (0.085; $p<0.01$). [19] These results suggest that the precision of idiosyncratic information especially improved once firms are fully-compliant with IFRS reporting. The fact that both private and common information precision increased from fiscal year 2006 onwards supports the view that common and private information

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[19] As an alternative specification, when we include the precision of public information (h) as a control variable, adjusted-R^2 of the model in column (2) increases from 0.138 to 0.188. Moreover,, the coefficient on h is positive and statistically significant at the 0.01 level, while the inferences with respect to the variables, ADOPT and POSTADOPT, remain the same.

serve as complements to each other. That is, better public information increases the quality of private information.

When ρ is the dependent variable in column (3), neither the coefficient on ADOPT nor the coefficient on POSTADOPT are statistically significant at the 0.10 level. These results indicate that the percentage of the common information impounded in the mean forecast did not change in the year of IFRS adoption and thereafter. In other words, the increase in the precision of common information is offset by the increase in the precision of idiosyncratic information, such that the consensus among analysts remains unaffected.

When dispersion (D) or squared error in the mean forecast (SE) are used as dependent variables in columns (4) and (5), respectively, the coefficients on ADOPT and POSTADOPT are negative and statistically different from zero at the 0.05 level, indicating that dispersion and squared mean error in the first year of the mandatory adoption of IFRS and thereafter decreased. These results for dispersion and squared error in the mean forecast are consistent with those reported in prior IFRS research (e.g. Horton et al. 2009), which adds confidence that our sample is representative of what has been used in prior research to examine the effects of mandated IFRS adoption on the properties of realized forecasts.

As a sensitivity analysis, we also compare information environment proxies over time for a benchmark sample of US firms. The models in Panel B of Table 5 are identical to those used in Panel A, but use data from the US. Unlike the mandatory IFRS firms, U.S. firms do not experience an increase in precision of private and public information in 2005 or later years. In fact, the coefficients on ADOPT and POSTADOPT are negative and statistically significant at the 0.01 level when precision of common information (h) is

used as the dependent variable, suggesting that the precision of common information even reduced for U.S firms over the corresponding time period. Moreover, the consensus across analysts went down in the POSTADOPT period, while both dispersion and squared error in the mean forecast increased in the POSTADOPT period. Overall, the evidence from the benchmark U.S. sample provides confidence that our results for mandatory IFRS adopters are not driven by a time-varying omitted variable.

4.4 Subsample Analysis of Information Measures

In this section, we relate the change in the precision of common and private information to the magnitude of the earnings reconciliation between IFRS and local GAAP. Specifically, we measure the distance from local GAAP EPS to IFRS EPS (Diff_EPS) as $|EPS_{2004, \text{ local GAAP}} - EPS_{2004, \text{ IFRS restated}}|/|EPS_{2004, \text{ local GAAP}}|$, assign a firm to LOW, MEDIUM, and HIGH portfolios based on the level of Diff_EPS, and then define RESTATE_MEDIUM (RESTATE_LARGE) as 1 if a firm belongs to the medium (large) restatement portfolio, and 0 alternatively.[20]

We, therefore, consider the following specification in which all independent variables (except RESTATE_MEDIUM and RESTATE_LARGE) are incorporated as flow (change) variables:

$$\Delta INF = \alpha + \beta_1 RESTATE\_MEDIUM + \beta_2 RESTATE\_LARGE + \beta_3 \Delta C \qquad (5)$$

where INF is alternatively precision in private or public information, C refers to firm-specific control variables in model (1), and all other variables are as defined

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[20] Note that EPS restatement information is available for 2004 only and that the sample size for this test drops from 1364 to 749 unique firms because for every firm we require that not only the 2004 EPS restatement information be available but also the forecast information properties' metrics and control variables in at least one year of both the pre- and post 2005 period be available.

before.[21] The change operator (Δ) for the dependent and independent variables represents a change in the average values of the variable in the post (2006 and 2007) period relative to the average values of the variable in the pre (2003 and 2004) period.

In Table 6, we report the results of estimating alternative specifications of regression equation (5). The first two columns report results using Δh as the dependent variable and the last two columns use Δs as the dependent variable. The tenor of our results is essentially unaltered irrespective of whether the control variables are included or excluded in the empirical specification. Specifically, the coefficients on RESTATE_LARGE are positive and statistically significant at the 0.01 level in all estimations, suggesting that changes in the precision of both public and private information in the post period are the largest for firms with largest changes in restatement portfolios. Overall, these results indicate that the information environment of analysts improves most for firms where IFRS adoption constitutes the largest EPS change.

[Insert Table 6]

4.5 IFRS, Earnings Management and Analysts' Expectations

In this section, we consider how a manager's ability to manage earnings to meet or beat analysts' expectations can affect our inferences. To the extent mandatory adoption of IFRS allows enough discretion to encourage meeting or beating earnings benchmarks, the actual earnings realization is likely to be dependent on the mean forecast, and the mean forecast error is biased toward zero. To explore this issue further, we replicate our analyses in Table 5 for subsamples of firms that are least likely to manage earnings. In our first subsample, we take all firm-years and exclude those for

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[21] We also tested model (5) using the change in consensus as the dependent variable. Untabulated results indicated no association of the change in consensus with the RESTATE_MEDIUM or RESTATE_LARGE variable.

which actual earnings beat the last median forecast by less than or equal to 1 percent (i.e., 1.00 < [actual EPS/median consensus EPS] ≤ 1.01) since small earnings surprises are more likely to reflect earning management (Burgstahler and Eames 2006). In our second subsample, we focus on firms with extreme earnings surprises because extreme surprises are also less indicative of earnings management to meet or beat consensus forecasts (Barron et al. 2002). In particular, we only include observations where firms have beaten the last median consensus EPS estimate by 20 percent or more.

Table 7 reports the regression results for the two subsamples. These results are consistent with the main analysis reported in Table 5, indicating that our documented positive IFRS effects on the precision of public and private information do not result from more earnings management practices under IFRS.

[Insert Table 7]

4.6 Analyst-specific Private Information Quality

In this section, we examine the sensitivity of our main results to the BKLS assumption that the expected precision of idiosyncratic information is the same across analysts following a firm. Gu (2005) argues that this assumption is unlikely to hold because analysts' private information can come either from their private communication with managers or from individual analytical skills and efforts, both of which can vary across analysts.

To address this issue, we follow Gu (2005) to derive analyst-specific precision using the following formula:

$$s_a = \frac{1}{V_a} - \frac{N(N-1)[SE - \frac{D}{N}]}{N^2[(1 - \frac{1}{N})D + SE]^2 - \sum_{i=1}^{N} V_a^2}$$

where V_a is the variance of error in the individual forecast by analyst a. Specifically, we calculate the precision of private information averaged at the analyst-year level ($\overline{\sqrt{s_a}}$) and track the evolution over time.

Because the unit of analysis is a specific analyst (instead of the firm followed by the analysts), we control for analyst characteristics related to their resources, skills, and experience. The idea is that analysts with certain characteristics benefit more from the mandatory IFRS adoption, which enables them to engage in more private information acquisition. The three analyst-level variables we examine relate to an analyst's coverage of countries (MULTI_CNTRY) and industries (IND_SPECIALIST), as well as broker size characteristics (BROKER_SIZE). MULTI_CNTRY is a dummy variable equal to one if the analyst follows firms located in more than one country, and zero otherwise. *IND_SPECIALIST* is a Herfindahl-type sector specialization measure based on the number of forecasts (*N*) an analyst (*a*) does in the same 2-digit industry (*i*) in year (*y*) compared to the number of forecasts the analysts provides across different countries (*c*). As in Sonney (2009), we code *IND_SPECIALIST* equal to one if $\sum_{i=1}^{I}\left(\dfrac{Ni,a,y}{Na,y}\right)^2 > 0.9$ and

$\sum_{c=1}^{C}\left(\dfrac{Nc,a,y}{Na,y}\right)^2 < 0.90$; and 0 otherwise.[22] *BROKER_SIZE* is the number of analysts employed by the brokerage firm that employs a firm's analyst.

We then estimate the following model:

$$s_a = \alpha_0 + \beta_1 ADOPT + \beta_2 POSTADOPT + \beta_k \sum C_k + \theta_k \sum C_k * ADOPT +$$
$$\lambda_k \sum C_k * POSTADOPT + \upsilon_a \sum A_a \, \varepsilon_{a,t} \tag{6}$$

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[22] Results are similar if we code IND_SPECIALIST equal to one if an analyst follows one 2-digit industry (SIC) code only.

where s_a is the standardized rank of the precision of private formation as calculated in Gu (2004) and averaged per analyst-year, C is an analyst-specific control variable, A is analyst-fixed effects, and all other variables are as defined above.

Panel A of Table 8 presents the descriptive statistics of precision of private information averaged at the analyst-year level and analyst-specific characteristics. The median analyst covers 2 countries and 3 industries. Sixty-two percent of the analysts follow firms in more than 1 country and 13 percent of the analysts are industry experts. The median number of analysts employed by a brokerage house is 52.

[Insert Table 8]

Panel B of Table 8 reports regression results for model (6) using s_a as the dependent variable. Each estimation adds an additional control variable and its interaction with ADOPT and POSTADOPT variable.[23] Standard errors are clustered at the analyst level (Petersen 2009). The coefficients on the main effects for MULTI_CNTRY are negative and statistically significant at the 0.01 level, suggesting that analysts that cover more countries exhibit less analyst-specific precision of private information in the pre-IFRS adoption period. The main effects for the other control variables (IND_SPEC and BROKER_SIZE) and ADOPT are statistically insignificant. However, the coefficients on POSTADOPT are positive and statistically significant at the 0.10 level, indicating that analyst-specific precision of private information increased after the first year of the mandatory adoption of IFRS. These results are similar to those reported in Table 5 (which is based on the firm-level precision measures) but yield some interesting additional insights. When we allow the analyst-specific variables to interact with

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[23] Because we introduce analyst-fixed effects in the model, we are unable to include an experience variable as an additional control in our models.

ADOPT and POSTADOPT variables, we find that the analysts that are following firms in more than one country experience a large adoption (0.053; t=3.12) and especially post-IFRS adoption increase (0.068; t=4.15) in private information precision. Before IFRS adoption, analysts following firms in multiple countries experienced no private information advantage compared to other analysts. However, IFRS reporting seems to give these analysts a boost in their private information precision quality.

These findings are consistent with IFRS promoting comparability across countries, and comparability affecting analysts' private information production positively, especially for those analysts following firms across different countries. Overall, these results complement the findings in the U.S. setting documented by De Franco et al. (2009) on the effects of comparability on analyst following, forecast accuracy, and bias.

4.7 Industry/Country Types and Forecasts Information Properties

Using similar research samples, related studies have found modest evidence on analyst forecast accuracy and dispersion improvements but stronger evidence when data are sliced across financial versus non-financial firms (Horton et al. 2009) and across country-level variables (Byard et al., 2010). We therefore examine two extensions to our baseline predictions. First, we examine whether the precision of the public and private information, and analysts' consensus vary cross-sectionally depending on whether a firm belongs to the financial or non-financial industry similar to the approach in Horton et al. (2009). Empirically, we group firms into financial and non-financial firms and examine whether the information environment variables changed after the mandatory adoption of IFRS. Unreported results show qualitatively similar findings compared to full sample results reported in Panel A of Table 5, except that the increase in private information

precision in the ADOPT period becomes significant at conventional (5%, one-sided) levels for non-financials. This is consistent with the findings in Horton et al. (2009) who show that analyst forecast accuracy improved especially for non-financial firms.

Second, we examine whether the change in information environment variables varies across countries classified by the strength of the enforcement regime and extent of differences between IFRS and domestic accounting standards. Byard et al. (2010) find significant decreases in both forecast errors and dispersion for mandatory adopters domiciled in countries with both strong enforcement and domestic accounting standards that differ substantially from IFRS. Therefore, we also focus on the information environment variables conditional on countries' institutional characteristics. Specifically, we use the "Rule of Law" measure for 2005 from Kaufman et al. (2007) to capture the strength of legal enforcement. Rule of Law measures can be positive or negative, with higher values indicating stronger legal and enforcement regimes. Moreover, we follow Bae et al. (2008) to measure differences between IFRS and local GAAP. Bae et al (2008) focus on 21 key accounting items and rely on a comprehensive survey (Nobes 2001) to identify differences in these 21 accounting items between the local GAAP and IFRS.[24] GAAP differences have a theoretical range from zero to 21.

Untabulated results indicate that the results for the two subsamples of countries are qualitatively similar with one notable exception. Specifically, for countries with weak enforcement regimes and a large distance in local GAAP to IFRS (i.e., the country cluster of Belgium, France, Greece, Italy, Spain, and Portugal), the increase in public

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[24] Examples of topics of accounting differences across countries relate to recognition and measurement of financial instruments, impairment losses, provisions, employee benefit liabilities, capitalization of research and development expenses and internally generated intangible assets, disclosure of related party transactions, presentation of a statement of changes in equity and a statement of cash flows.

information precision becomes insignificant in the ADOPT period (0.004; *t*=0.29), but is statistically significant in the POSTADOPT period (0.082; *t*=6.17).[25] This finding is not surprising in that analysts' learning effects may have taken somewhat longer when IFRS substantially differed from local GAAP. However, the statistically significant POSTADOPT coefficient does suggest similar information improvements for all EU countries after full-IFRS compliant reporting.

5. Conclusions

In this paper, we examine whether mandatory IFRS adoptions affected the properties of information contained in analyst forecasts. The period surrounding mandatory adoption of IFRS provides a particularly useful setting to examine the effect of change in information publicly available to financial analysts. Whereas prior studies have documented improvements in the corporate information environment post-IFRS adoption, there is no evidence so far on the information channel that caused these improvements. Using the information precision measures derived from analyst forecasts and first developed by Barron et al. (1998), our results indicate that mandatory adoption of IFRS triggered the generation of both more precise common (*public*) and private (*idiosyncratic*) information by financial analysts.

Despite the observed changes in the precision of public and private information, we are unable to detect a change in the consensus among financial analysts after the mandatory adoption of IFRS. This absence of a detectable change in the consensus among financial analysts suggests that the percentage increase in the precision of common information is offset by a proportionate increase in the precision of private

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[25] Following Byard et al. (2010), this cluster consists of sample countries with "Rule of Law" values of less than 1.6 (sample median) and IFRS local GAAP difference greater than or equal to 11 (sample median).

information such that consensus among analysts does not change. At the analyst-specific level, we find that the analysts who followed firms in more than one country experience the largest post-IFRS improvement in private information precision.

Overall, our results suggest that mandatory adoption of IFRS had a significant effect on the information processing of financial analysts, but that analysts do require some adjustment period in which they learn to deal with the new disclosures and measurement rules. This is especially the case when there are large differences between local GAAP and IFRS rules and for financial firms that are governed by complicated and sometimes still evolving IFRS rules (e.g., on financial instruments). Moreover, we show that the precision improvement did not occur homogeneously across analysts. In particular, we find evidence consistent with mandatory IFRS adoption in Europe promoting comparability, which in turn positively affected private information production of those analysts following firms across multiple countries. Our results are consistent with the argument in De Franco et al. (2009) that increased comparability lowers the costs of acquiring information from sources other than management, thereby affecting analyst forecast accuracy and bias. Our results also suggest that analysts invested differently in private information discovery in response to the mandatory adoption of IFRS.

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Table 1: Sample Selection Process

Panel A: EU Sample

Sample Criteria	# Individual Forecasts	# Analyst Years	# Firm Years	# Unique Analysts	# Unique Firms
EU17, 12/31 fiscal year-end firms with non-stale one-year ahead EPS forecasts in I/B/E/S for the 2003-07 period	84,151	11,775	7,347	4,757	2,368
Minus firms with less than 2 analyst forecasts per estimation period (FPE1):	-1,820	-252	-1,795	-109	-608
=	82,331	11,523	5,552	4,648	1,760
Minus: early adopters or those required to adopt only after 2007	-14,867	-643	-708	-169	-173
= Sample of Mandatory IFRS adopters:	67,464	10,880	4,844	4,479	1,587
Minus: firms with insufficient data available to conduct multivariate analyses:	-1,588	-1,074	-314	-396	-223
= Final Sample	**65,876**	**9,856**	**4,530**	**4,083**	**1,364**

Panel B: US (Control) Sample

Sample Criteria	# Individual Forecasts	# Analyst Years	# Firm Years	# Unique Analysts	# Unique Firms
US, 12/31 fiscal year-end firms with 1 or more FPE1 EPS forecasts in IBES for the 2003-07 period	194,643	18,502	14,742	6,743	4,305
Minus firms with less than 2 analyst forecasts per estimation period (FPE1):	-61,404	-6,538	-4,523	-2,205	-1,050
=	133,239	11,964	10,219	4,538	3,255
Minus: firms with insufficient data available to conduct multivariate analyses:	-3,012	-254	243	-123	-97
= Final sample	**130,227**	**11,710**	**9,776**	**4,415**	**3,158**

Table 2: Descriptive Statistics of Barron et al. (1998) Measures by Period

Variable	period	N	Median	Q1	Q3	Std
	1	1,779	4.875	1.002	17.583	354.56
h	2	947	6.607	1.213	22.271	162.30
	3	1,804	11.938	2.319	47.557	418.17
	1	1,779	2.093	0.191	16.823	816.25
s	2	947	2.885	0.197	22.651	338.81
	3	1,804	5.768	0.375	51.397	736.90
ρ	1	1,779	0.736	0.341	0.934	0.34
	2	947	0.751	0.314	0.942	0.35
	3	1,804	0.720	0.283	0.939	0.35
D	1	1,779	0.016	0.004	0.072	42.16
	2	948	0.009	0.003	0.036	2.78
	3	1,804	0.005	0.001	0.025	4.37
SE	1	1,779	0.053	0.009	0.307	118.03
	2	948	0.039	0.007	0.189	6.78
	3	1,804	0.021	0.003	0.123	6.92

Period 1 refers to 2003 and 2004 when IFRS adoption was not mandatory. Period 2 refers to 2005 when IFRS adoption became mandatory. Period 3 covers years after the first year of mandatory IFRS adoption (2006 and 2007). All variables are as defined in Appendix 1.

Table 3: Descriptive Statistics of Control Variables Used in Multivariate Tests

Panel A:EU sample

Variable	N	Mean	Q1	Median	Q3	Std
MV	4,530	5,020	324	970	3,587	11,995
MTB	4,530	3.29	1.51	2.23	3.43	15.30
RD	4,530	60.99	0.00	0.00	9.80	330.30
NUMANAL	4,530	7.22	3.00	5.00	10.00	5.70
AVG_PREDLAG	4,530	33.05	19.50	30.00	45.00	18.20
PROP_LATE	4,530	0.531	0.429	0.548	0.667	0.182

Panel B: US Benchmark Sample

Variable	N	Mean	Q1	Median	P75	Std
MV	9,776	6,743	395	1,105	3,713	22,261
MTB	9,776	3.49	1.51	2.19	3.41	53.45
RD	9,776	99.13	0.00	0.00	21.18	541.00
NUMANAL	9,776	6.53	3.00	5.00	8.00	5.04
AVG_PREDLAG	9,776	23.90	10.67	20.91	34.00	17.61
PROP_LATE	9,776	0.408	0.286	0.412	0.556	0.196

All variables are as defined in Appendix 1.

Table 4: Correlations (EU sample)

Variables	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
[1] h	1.000	0.539	0.102	-0.769	-0.567	0.113	0.168	-0.059	0.045	-0.018	0.102
		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00
[2] s		1.000	-0.727	-0.278	-0.922	0.151	0.157	-0.018	0.162	-0.012	0.090
			0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.40	0.00
[3] ρ			1.000	-0.345	0.601	-0.118	-0.060	-0.038	-0.180	-0.005	-0.025
				0.00	0.00	0.00	0.00	0.01	0.00	0.72	0.09
[4] D				1.000	0.457	-0.031	-0.149	0.096	0.098	0.023	-0.109
					0.00	0.04	0.00	0.00	0.00	0.13	0.00
[5] SE					1.000	-0.135	-0.181	0.040	-0.108	0.008	-0.106
						0.00	0.00	0.01	0.00	0.57	0.00
[6] MV						1.000	0.111	0.311	0.591	-0.212	-0.005
							0.00	0.00	0.00	0.00	0.74
[7] MTB							1.000	0.078	0.059	-0.018	0.039
								0.00	0.00	0.22	0.01
[8] RD								1.000	0.303	-0.154	-0.126
									0.00	0.00	0.00
[9] NUMANAL									1.000	-0.270	-0.317
										0.00	0.00
[10] AVG_PREDLAG										1.000	0.159
											0.00
[11] PROP_LATE											1.000

Note: The table reports Pearson correlations between the variables of interest (standardized and ranked values). *P*-values are reported below the correlation values. All variables are as defined in Appendix 1.

Table 5: Regression Results

Panel A: EU sample

Dependent Variable:	Precision of Common Info. (h)			Precision of Idiosyncratic Info. (s)			Consensus (ρ)			D			SE		
	(1)			(2)			(3)			(4)			(5)		
Constant	0.297	4.73	‡	0.128	2.58	‡	0.784	13.01	‡	0.514	10.84	‡	0.650	14.78	‡
ADOPT	0.022	2.40	†	0.015	1.46		0.009	0.81		-0.040	-4.48	‡	-0.026	-2.50	†
POSTADOPT	0.105	11.05	‡	0.085	8.84	‡	0.006	0.61		-0.153	-15.87	‡	-0.106	-11.16	‡
MV	0.049	1.69	*	0.095	3.11	‡	-0.033	-1.22		-0.083	-2.63	‡	-0.095	-3.09	‡
MTB	0.179	9.99	‡	0.171	9.05	‡	-0.033	-1.93	*	-0.235	-11.92	‡	-0.203	-10.62	‡
RD	-0.178	-3.59	‡	-0.162	-3.14	‡	-0.020	-0.45		0.236	4.11	‡	0.179	3.34	‡
NUMANAL	0.089	3.07	‡	0.126	4.07	‡	-0.187	-6.57	‡	0.151	4.73	‡	-0.068	-2.19	†
AVG_PREDLAG	-0.033	-2.19	†	-0.007	-0.47		-0.043	-2.73	‡	0.074	4.85	‡	0.016	1.11	
PROP_LATE	0.060	3.55	‡	0.090	4.88	‡	-0.050	-2.77	‡	-0.057	-3.18	‡	-0.092	-5.03	‡
Industry (1-digit)-fixed effects	Yes			Yes			Yes			Yes			Yes		
Country-fixed effects	Yes			Yes.			Yes			Yes			Yes.		
N	4,530			4,530			4,530			4,530			4,530		
# of firms	1,364			1,364			1,364			1,364			1,364		
Adj-R^2	0.119			0.138			0.064			0.194			0.150		

‡, †, * : significant at the 1%, 5% and 10% level.
Note that both the dependent and independent variables are standardized rank (0,1) variables as in BKLS (2002). All variables are as defined in Appendix 1. Standard errors are White (1980) heteroscedasticity-consistent and clustered at the firm-level (Petersen 2009).

Table 5: Regression Results (Continued)

Panel B: US (Benchmark) Sample

Dependent variable:	(1) Precision of Common Info (h)			(2) Precision of Idiosync. Info. (s)			(3) Consensus (ρ)			(4) D			(5) SE		
Constant	0.395	13.82	‡	0.188	7.59	‡	0.824	34.81	‡	0.524	17.23	‡	0.807	30.43	‡
ADOPT	-0.019	-3.05	‡	-0.011	-1.58		0.002	0.27		0.011	1.79	*	0.009	1.38	
POSTADOPT	-0.040	-6.68	‡	-0.005	-0.76		-0.023	-3.36	‡	0.045	7.51	‡	0.015	2.38	‡
MV	0.337	19.39	‡	0.228	14.82	‡	0.003	0.20		-0.332	-18.30	‡	-0.284	-17.45	‡
MTB	0.123	9.48	‡	0.095	7.98	‡	-0.023	-1.93	*	-0.103	-7.60	‡	-0.111	-8.80	‡
RD	-0.164	-3.72	‡	-0.026	-0.70		-0.123	-3.50	‡	0.222	4.72	‡	0.058	1.43	
NUMANAL	-0.033	-1.75	*	0.064	3.85	‡	-0.116	-7.14	‡	0.145	7.38	‡	0.009	0.49	
AVG_PREDLAG	0.016	1.61	*	0.063	5.94	‡	-0.074	-6.75	‡	0.033	3.20	‡	-0.043	-4.19	‡
PROP_LATE	0.028	2.46	†	0.070	6.22	‡	-0.060	-5.26	‡	-0.022	-1.84	*	-0.070	-6.01	‡
Industry (1-digit) Fixed Effects	Yes			Yes			Yes			Yes			Yes		
N	9,776			9,776			9,776			9,776			9,776		
# of firms	3,097			3,097			3,097			3,097			3,097		
Adj-R^2	0.187			0.111			0.034			0.184			0.142		

‡, †, * : significant at the 1%, 5% and 10% level.
 Note that both the dependent and independent variables are standardized rank (0,1) variables as in BKLS (2002). All variables are as defined in Appendix 1. Standard errors are White (1980) heteroscedasticity-consistent and clustered at the firm-level (Petersen 2009).

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Table 6: Regression Results of the Changes in the Precision of Public and Private Information for Subsamples Classified by the Magnitude of EPS Restatement Difference Reported At First-time IFRS Adoption

Dependent Variable:	Δ in precision of common information (h)				Δ in precision of private information (s)			
	(1)		(2)		(3)		(4)	
	Parameter Estimate	t-stat	Parameter Estimate	t-stat	Parameter Estimate	t-stat	Parameter Estimate	t-stat
Constant	0.472	24.30‡	0.295	5.96‡	0.479	24.20‡	0.417	8.03‡
RESTATE_MEDIUM	0.007	0.27	0.004	0.14	0.005	0.18	0.001	0.03
RESTATE_LARGE	0.069	2.65‡	0.068	2.66‡	0.063	2.42‡	0.065	2.51‡
Δ(MV)			0.142	3.97‡			0.162	4.34‡
Δ(MTB)			0.077	1.98*			0.004	0.10
Δ(R&D)			-0.004	-0.10			0.045	1.23
Δ(NUMANAL)			0.061	1.48			-0.101	-2.48†
Δ(AVG_PREDLAG)			-0.020	-0.54			-0.010	-0.26
Δ(PROP_LATE)			0.099	2.30†			0.020	0.47
N	749		749		749		749	
Adj-R^2	0.011		0.053		0.021		0.050	

*‡, †, ** : significant at the 1%, 5% and 10% level.

Firms in the SMALL, MEDIUM, and LARGE restatements portfolio reflect the bottom third, middle third, and top third, respectively, of the restatement measured as the absolute value of 2004 local GAAP earnings per share (EPS) minus the reconciled 2004 IFRS EPS, scaled by local EPS (i.e., |(EPS$_{LOCAL04}$ - EPS$_{IFRS04}$)/ EPS$_{LOCAL04}$|. RESTATE_MEDIUM is 1 if a firm belongs to the MEDIUM restatement portfolio, 0 otherwise. RESTATE_LARGE is 1 if a firm belongs to the LARGE restatement portfolio, 0 otherwise. All other variables are as defined in Appendix 1 and the change operator (Δ) for the dependent and independent variables represents a change in the variable in the ADOPT (i.e., 2005) period relative to the average values of the variable in the pre (2003 and 2004) period. Standard errors are White (1980) heteroscedasticity-consistent and clustered at the firm-level (Petersen 2009).

Table 7: Regression Results for Subsamples with Low Earnings Management Probability around IFRS Adoption

Dependent Variables	Sample excluding Firms with Small Positive Earnings Surprise						Sample of Firms with Extreme Positive Earnings Surprise Only					
	Precision of Common info. (h)			Precision of Idiosyncratic Info. (s)			Precision of Common Info. (h)			Precision of Idiosyncratic Info. (s)		
	Parameter Estimate	t-stat		Parameter Estimate	t-stat		Parameter Estimate	t-stat		Parameter Estimate	t-stat	
Constant	0.314	6.54	‡	0.258	5.98	‡	0.078	1.06		-0.164	-2.16	†
ADOPT	0.019	2.05	†	0.007	0.73		0.034	1.73	*	0.019	0.89	
POSTADOPT	0.127	12.83	‡	0.076	7.66	‡	0.102	5.01	‡	0.092	4.50	‡
MV	0.169	4.85	‡	0.199	5.89	‡	0.154	2.53	‡	0.061	1.04	
MTB	0.215	10.95	‡	0.158	8.50	‡	0.105	2.82	‡	-0.045	-1.31	
RD	-0.227	-4.00	‡	-0.153	-2.94	‡	-0.265	-2.92	‡	-0.036	-0.41	
NUM_ANAL	-0.030	-0.88		0.046	1.39		0.016	0.28		0.170	2.98	‡
AVG_PREDLAG	-0.032	-2.03	†	-0.001	-0.04		-0.002	-0.07		0.017	0.54	
PROP_LATE	0.057	3.14	‡	0.049	2.58	‡	0.099	2.73	‡	0.090	2.52	‡
Industry fixed effects	Yes			Yes			Yes			Yes		
Country fixed effects	Yes			Yes			Yes			Yes		
N	4,350			4,350			815			815		
# Of Firms	1,352			1,352			501			501		
Adj-R^2	0.184			0.266			0.226			0.234		

‡, †, * : significant at the 1%, 5% and 10% level.
The first subsample excludes firm-years for which actual earnings beat the last median forecast by less than or equal to 1 percent (i.e., 1.00 < [actual EPS/median consensus EPS] ≤ 1.01). Sample of extreme positive earnings surprise includes firms that have beaten the last median consensus EPS estimate by 20 percent or more. All variables are defined in the Appendix. Standard errors are White (1980) heteroscedasticity-consistent and clustered at the firm-level (Petersen 2009).

Table 8: Descriptive Statistics and Regression Results (Analyst-level Analysis)

Panel A: Analyst Characteristics

Variable

	N	Mean	Median	P5	Q1	Q3	P95	Std
$\sqrt{\overline{s_a}}$	9,856	26.52	5.72	0.00	1.65	16.39	97.97	134.50
NR_COUNTRIES	9,856	2.52	2.00	1.00	1.00	3.00	6.00	1.69
MULTI_CNTRY	9,856	0.62	1.00	1.00	1.00	0.00	0.00	0.49
NR_INDUSTRIES	9,856	4.01	3.00	1.00	2.00	5.00	9.00	2.87
IND_SPEC	9,856	0.13	0.00	0.00	0.00	0.00	1.00	0.34
BROKER_SIZE	9,856	77.55	52.00	8.00	20.00	114.00	228.00	74.83

Panel B: Regression Results

	Parameter estimate	t-stat		Parameter estimate	t-stat		Parameter estimate	t-stat	
				Dependent Variable: STRANK(s_a)					
Constant	0.491	25.39	‡	0.491	22.26	‡	0.495	21.97	‡
ADOPT	0.012	0.86		0.012	0.79		0.008	0.41	
POSTADOPT	0.049	3.77	‡	0.049	3.35	‡	0.036	1.84	*
MULTI_CNTRY	-0.035	-2.28	†	-0.036	-2.00	*	-0.034	-1.90	*
MULTI_CNTRY xADOPT	0.053	3.12	‡	0.053	2.72	‡	0.052	2.59	‡
MULTI_CNTRY xPOST	0.068	4.15	‡	0.070	3.66	‡	0.065	3.27	‡
IND_SPEC	0.011	0.64		0.015	0.63		0.018	0.72	
IND_SPECxADOPT				0.003	0.10		0.002	0.07	
IND_SPECxPOST				-0.012	-0.45		-0.016	-0.58	
BROKER_SIZE	-0.027	-0.81		-0.027	-0.72		-0.037	-0.93	
BROKER_SIZExADOPT							0.009	0.28	
BROKER_SIZExPOST							0.033	0.97	
Analyst Fixed Effects	Yes			Yes			Yes		
N.	9,856			9,856			9,856		
# of Analysts	4,083			4,083			4,083		
Adj-R^2	0.201			0.201			0.201		

‡, †, * : significant at the 1%, 5% and 10% level.
 For regression analysis, the dependent variable s_a and the variable *BROKER_SIZE* are ranked and standardized between 0 and 1 because raw values of are highly skewed.). Standard errors are White (1980) heteroscedasticity-consistent and clustered at the analyst-level (Petersen 2009). All variables are defined in the Appendix 1.

Appendix 1: Variable Definitions

Variable	Definition

Dependent Variables:

Precision of common info (h)

$$\frac{SE - \dfrac{D}{N}}{\left[\left(1 - \dfrac{1}{N}\right)D + SE\right]^2}$$

Precision of private information (s)

$$\frac{D}{\left[\left(1 - \dfrac{1}{N}\right)D + SE\right]^2}$$

Consensus (ρ)

$$\frac{SE - \dfrac{D}{N}}{\left(1 - \dfrac{1}{N}\right)D + SE}$$

where D   Dispersion among the forecasts of a firm and is equal to

$$\frac{1}{N-1}\sum_{i=1}^{N}\left(F_i - \overline{F}\right)^2,$$

SE   Squared error in the mean forecast of a firm and is equal to $\left(A - \overline{F}\right)^2$,

F_a Forecast by analyst *a*,

$\overline{F}$ Mean forecast,

A   Actual earnings realization,

N   Number of analysts issuing forecasts

$\overline{\sqrt{s_a}}$ Average square root of the analyst-specific private information component (s_a), calculated as in Gu (2005).

Test and Control Variables

ADOPT   Dummy variable equal to 1 if a firm observation is from 2005 fiscal-year (mandatory IFRS adoption year) and 0 otherwise.

POSTADOPT   Dummy variable equal to 1 if a firm observation is from 2006 or later fiscal year (post-mandatory IFRS adoption year) and 0 otherwise

MV   Fiscal year-end market value of equity (in millions Euros) [Source: Datastream]

MTB	Fiscal-year-end market-to-book ratio [Source: Datastream]

RD — Average R&D expenses per firm in the post-IFRS [2006 and 2007] period [Source: Datastream]

NUMANAL — Total number of unique analysts that issue at least one forecast during the 3-month period following prior year's earnings announcement [Source: Datastream]

AVG_PREDLAG — Average number of days between previous year's earnings announcement and an analyst's initial EPS forecast that was initiated within 3 months after prior year's earnings announcement [Source: I/B/E/S]

PROP_LATE — Proportion of 1-year ahead EPS forecasts that are initiated *after* the 3 month period after prior year's earnings announcement, expressed as a fraction of all one-year ahead forecasts during the calendar year [Source: I/B/E/S]

Analyst-Specific Variables

NR_COUNTRIES — Number of different countries that a specific analysts covers

MULTI_CNTRY — Dummy variable equal to one if the analyst follows firms located in more than one country, zero otherwise.

BROKER_SIZE — Number of analysts employed by the brokerage house

NR_INDUSTRIES — Number of 2-digit SIC codes that a specific analysts covers

IND_SPEC — Herfindahl-based sector specialization measure based on the number of forecasts (*N*) an analyst (*a*) does for the same 2-digit industry (*i*) in year (*y*) compared to the number of forecasts the analysts provides across different countries (c). *IND_SPEC* is coded equal to one (1) if

$$\sum_{i=1}^{I}\left(\frac{Ni,a,y}{Na,y}\right)^2 > 0.9 \text{ and } \sum_{c=1}^{C}\left(\frac{Nc,a,y}{Na,y}\right)^2 < 0.90; \ 0 \text{ otherwise}$$