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## **How do International Financial Reporting Standards affect information asymmetry? The importance of the earnings quality channel**

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# **How do International Financial Reporting Standards affect information asymmetry? The importance of the earnings quality channel**

## **Abstract**

Previous studies have provided evidence of the effect that accounting regulation through the adoption of International Financial Reporting Standards (IFRS) has on the informational environment. However, none have investigated how this effect is driven. This study examines whether earnings quality is an effective channel through which the IFRS can mitigate the level of information asymmetry. Based on a sample of French listed companies, we find that information asymmetry decreases significantly after the adoption of IFRS. Using a path analysis and maximum likelihood estimations, the results show that the faithful representation component of earnings quality is the only channel through which IFRS decrease the level of information asymmetry. This finding suggests that the faithful representation of earnings increased under IFRS regulation, which, in turn, enhanced the quality of the informational environment. Our findings are robust using several sensitivity analyses.

**Keywords:** IFRS, information asymmetry, earnings quality, faithful representation, relevance, path analysis.

## 1. Introduction

The economic consequences of the voluntary and mandatory implementation of International Financial Reporting Standards (IFRS) have been the subject of an extensive literature (see for example Brüggemann et al., 2013). Some have argued that IFRS enhance market liquidity (Leuz & Verrecchia, 2000; Karamanou & Nishiotis, 2009; Platikanova & Perramon, 2012), reduce the cost of capital (Daske, 2006; Daske et al., 2008; Góis et al., 2018), and improve analyst forecast accuracy (Tan et al., 2011; Horton et al., 2013; He & Lu, 2018). IFRS adoption has also led to a decrease in the level of information asymmetry (Neel, 2017).

The presence of asymmetric information in a financial market is at the origin of a poor informational environment. The accounting regulation via IFRS was intended to enhance the transparency of financial reporting. The effect of IFRS adoption on information asymmetry was studied empirically by Cho et al. (2015), who argued that IFRS failed to decrease the level of information asymmetry between informed and uninformed investors. However, Neel (2017) and Persakis and Iatridis (2017) showed that there is a negative relationship between the IFRS and information asymmetry, and that this effect is more prevalent in firms with high earnings quality.

While the effect of IFRS on information asymmetry has been studied previously, the channels through which IFRS lead to a more transparent informational environment remain largely unexplored. We fill this gap by examining how IFRS adoption affects the level of information asymmetry. In particular, we investigated the earnings quality channel through which IFRS mitigates information asymmetry, as previous studies implicitly assume that high earnings quality under IFRS decreases information asymmetry (Leuz & Verrecchia, 2000; Daske et al., 2008; Karamanou & Nishiotis, 2009; Horton et al., 2013). The focus on the earnings quality channel is important for at least two reasons. First, the IFRS are thought to improve the quality of financial reporting (Barth et al., 2008; Chen et al., 2010; Houqe et al., 2012; Cai et al., 2014). Second, there is empirical evidence of the negative effect of high-quality financial reporting on information asymmetry between users (Richardson, 2000; Affleck-Graves et al., 2002; Yu, 2008; Barth et al., 2013; Bhattacharya et al., 2013; Li, 2015). Therefore, earnings quality may play a mediating role between IFRS and the level of information asymmetry.

Using data from 2002 to 2015 for a sample of 279 French-listed firms, we found that IFRS adoption is associated with a decrease in information asymmetry. This decrease is more pronounced in the later years after adoption. Our findings are robust using alternative measures of information asymmetry and earnings quality. Furthermore, using a path analysis and maximum likelihood (ML) estimations, we found that IFRS did not improve earnings quality; instead, only the faithful representation of earnings improved after the adoption of the IFRS, while earnings relevance decreased. These findings suggest that IFRS mitigates information asymmetry through enhancing the faithful representation of earnings.

Our paper makes several contributions to the literature. First, the effect of IFRS adoption over a significant period of time (i.e., a decade after the 2005 mandate) was examined. Indeed, IFRS recently underwent significant changes that were not included in previous studies on the consequences of IFRS adoption. For instance, the conceptual framework of the International Accounting Standards Board (IASB), published in 2010, has paid a great attention to investors as the primary users of financial information. Second, to the best of our knowledge, this is the first study to examine the indirect effect of IFRS on information asymmetry through earnings quality. We show the existence of an indirect relationship between the implementation of IFRS and information asymmetry levels through earnings quality, using a path analysis.

Moreover, we extended previous research by Neel (2017) who focused on earnings comparability, which is a complementary characteristic to earnings quality. However, we take a closer look at earnings quality. Indeed, according to the conceptual framework of IASB (2010), relevance and faithful representation are the fundamental qualitative characteristics of useful financial information. Hence, our analysis is based on an aggregate measure of earnings quality which includes relevance and faithful representation attributes.

Finally, this research focused on a single continental European country setting: France. This is likely to limit the heterogeneity issue caused by the specific characteristics of the accounting systems in different countries (Platikanova & Perramon, 2012). Also, IFRS are strongly inspired by the standards in common law countries. In France, the accounting system is closely linked to public authorities, and investors are not considered the main users of accounting information. IFRS brings then an innovative approach and a new philosophy of accounting standards in France.

The remainder of the paper is structured as follows. Section 2 provides a review of the literature and outlines the development of the hypotheses. Section 3 describes the sample and presents the research design. Section 4 discusses the results and the sensitivity analysis, and the last section offers conclusions.

## **2. Literature review and hypothesis development**

The regulation of international accounting via IFRS was intended to improve the transparency and comparability of financial statements and to help investors obtain high quality information compared to other domestic accounting systems. According to the IASB's conceptual framework, the objective of financial reporting is to provide financial information that is useful to existing and potential investors (IASB, 2010). This information should limit the opacity of firms and transmit information useful for decision-making.

Prior studies show that international accounting standards improve the information environment. Platikanova and Perramon (2012) and Abad et al. (2018) found evidence that market liquidity increased after the mandatory adoption of IFRS. Góis et al. (2018) showed that mandatory adoption of IFRS led to a decrease in the cost of capital. Similarly, Daske et al. (2013) found that IFRS and the cost of capital are negatively related, particularly for “serious adopters”<sup>1</sup>. Horton et al. (2013) and He and Lu (2018) provided evidence of an improvement in analyst forecast accuracy and a decrease in information asymmetry after IFRS adoption.

While it is unclear through which channels the IFRS decrease the level of information asymmetry, the two most frequent explanations are associated implicitly with accounting comparability and earnings quality. According to Daske et al. (2008), comparability avoids issues related to the diversity of accounting systems between countries. It may also solve the problems of interpreting financial information, which can motivate analysts to follow foreign firms and mitigate forecast errors (Tan et al., 2011). According to Neel (2017), accounting comparability positively affects the informational environment by producing high-quality financial reporting. However, comparability alone may not be adequate in reducing asymmetric information if the main users do not benefit from high-quality information, that is

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<sup>1</sup> According to Daske et al. (2013), “serious adopters” means that firms are “serious” about the change in their reporting strategy. They have strong management reporting incentives, including the underlying motivations for the accounting change, rather than the change in accounting standards per se.

earnings quality (Barth et al., 1999; Daske et al., 2008). Thus, it can be assumed that the effect of the IFRS on information asymmetry is mainly driven by earnings quality.

## **2.1 The effects of IFRS on earnings quality**

High earnings quality is a primary objective of IFRS (IASB, 2010). The IASB Conceptual Framework lists faithful representation and relevance as fundamental qualitative characteristics of useful financial information. Faithful representation means that information reflects the substance of an economic phenomenon in a neutral way, without significant errors or biases (IASB, 2010). However, managers may manipulate earnings to serve their own interests at the expense of external shareholders (Jensen & Meckling, 1976; Burgstahler & Dichev, 1997; Dechow & Skinner, 2000) and mislead investors (Watts & Zimmerman, 1986). Hence, IFRS limits accounting choices to prevent opportunistic managerial behavior. In particular, IFRS are likely to constrain the discretion of managers by imposing specific guidelines for the recognition and production of accounting information (Barth et al., 2008). Previous studies show that IFRS adoption can decrease earnings management via accruals or income smoothing (Chen et al., 2010; Zéghal et al., 2011; Houqe et al., 2012; Cai et al., 2014) and increase conditional conservatism (Barth et al., 2008; Chen et al., 2010; Liu et al., 2011)<sup>2</sup>.

Regarding earnings relevance, the IASB's conceptual framework states that accounting information is relevant when it influences investors' decisions. This is the informational role of accounting figures that must reflect investors' expectations of a firm's future cash flows on stock prices (Ohlson, 1995; Barth et al., 2001; Landsman et al., 2012). IFRS strengthened investors' ability to make decisions through the fair value measurement that reflects real economic situations (Barth et al., 2008). This is likely to enhance information relevance. Most literature on the effects of IFRS adoption found that international standards are likely to increase the relevance of earnings measured by different proxies, such as value relevance (Barth et al., 2008; Liu et al., 2011) and predictability (Sun et al., 2011; Liu & Sun, 2015).

## **2.2 Effect of earnings quality on information asymmetry**

The existing literature identified earnings quality as a major driver of information asymmetry (Leuz & Verrecchia, 2000; Karamanou & Nishiotis, 2009; Horton et al., 2013). The agency conflicts of interests between managers and shareholders may lead the former to

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<sup>2</sup> Previous studies combined the various attribute of earnings quality without distinguishing between faithful representation and relevance.

release poor quality earnings (Watts & Zimmerman, 1986). Consequently, if users differ in their ability to handle information, the poor quality of earnings will increase the gap between informed and uninformed users (Diamond & Verrecchia, 1991; Bhattacharya et al., 2013). The informational gap among market participants increases then the adverse selection risk and exacerbates information asymmetry in financial markets (Glosten & Milgrom, 1985).

The importance of earnings quality in mitigating information asymmetry is largely supported in previous studies using different attributes of earnings quality. Bhattacharya et al. (2013) provided evidence that higher earnings management is significantly associated with higher information asymmetry. Affleck-Graves et al. (2002) found that firms with higher earnings predictability are associated with lower information asymmetry. Barth et al. (2013) showed that value relevance helps to decrease information asymmetry. This finding was also supported by Lang et al. (2012), who showed that earnings quality is associated with increased stock liquidity.

In summary, earnings quality proxied by earnings relevance and faithful representation is a major channel through which IFRS improves the informational environment. Indeed, IFRS is expected to enhance the faithful representation and relevance of earnings, which in turn can lessen the level of information asymmetry (see Figure 1). This leads to the following hypothesis:

*H<sub>1</sub>. The mandatory adoption of the IFRS enhances the faithful representation and relevance of earnings, which mitigates the level of information asymmetry.*

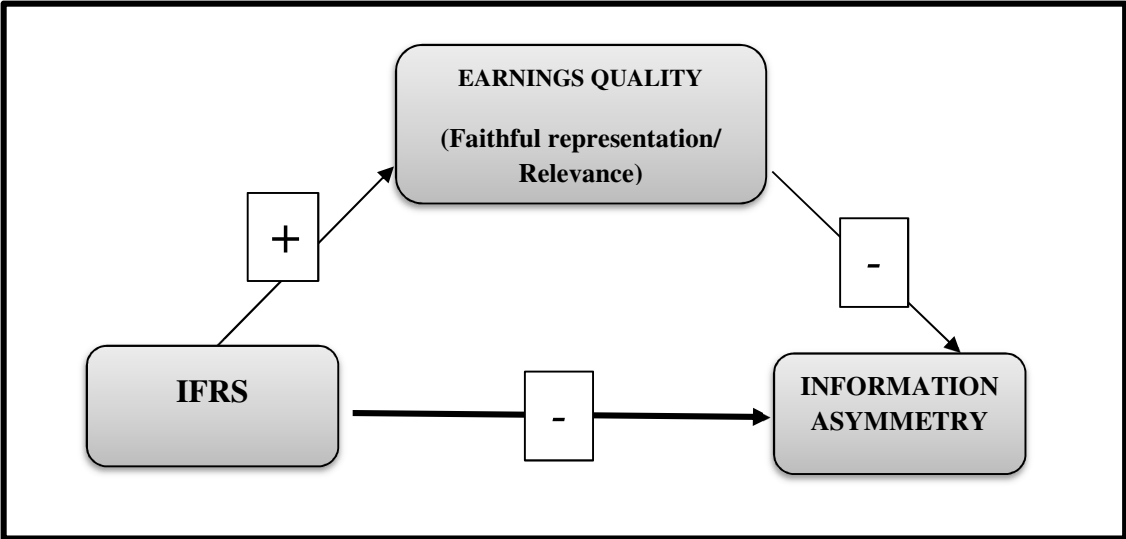


Figure 1. Impact of IFRS adoption on information asymmetry through earnings quality



### 3. Research design

#### 3.1 Data and sample selection

The sample consists of all French non-financial companies listed on the Paris Euronext stock exchange that adopted the mandatory IFRS in 2005. The data were retrieved from the Worldscope, Datastream, and I/B/E/S databases. Data were collected from 2002 to 2015, excluding 2005. The 2005 transition year was not included in the sample period because of the specific accounting requirements in first-time adoption. The final sample included 279 French firms with 3,627 observations.

Based on the Industry Classification Benchmark (ICB), the industry distribution of the sample is presented in Table 1. This table shows that the proportions of industrial and technological sectors total 22.94% and 22.22%, respectively. Only three firms belong to the telecommunication sector, representing the smallest proportion of the overall sample.

[Insert Table 1 Here]

#### 3.2 Definitions and the measurement of variables

##### 3.2.1 Information asymmetry

The most common information asymmetry measures are those related to market microstructure (Welker, 1995; Healy et al., 1999; Daske et al., 2008; Bhattacharya et al., 2013). In a context of uncertainty about a firm's ability to disclose information, market-makers are constrained to increase the range between the bid and the ask prices to compensate for possible losses in negotiations between informed and uninformed traders. The relative bid–ask spread is calculated as follows:

$$AI\_Spread_{it} = \frac{ASK_{it} - BID_{it}}{(ASK_{it} + BID_{it})/2}$$

where  $ASK_{it}$  is the best selling price, and  $BID_{it}$  is the best buying price.

Previous studies identified three components of the bid–ask spread: adverse selection component, order processing, and persistence of order direction (Roll, 1984; Huang & Stoll,

1997). As the French market is an order-driven market, we adopted the methodology of Lin et al. (1995) and used the adverse selection component as a proxy for information asymmetry (Van Ness et al., 2001). Following Lin et al. (1995), the adverse selection component was estimated using the following model:

$$Q_{t+1} - Q_t = \lambda Z_t + e_{t+1} \quad (1)$$

where  $Q_t$  is  $(Ask_t + Bid_t)/2$ ,  $Z_t$  is  $(P_t - Q_t)$

$\lambda$ : is the adverse selection component ( $AI\_SAD$ ).

### 3.2.2 Mediating variable: Earnings quality

According to the IASB's conceptual framework, accounting information should include the attributes of faithful representation and relevance.

#### 3.2.2.1 Faithful representation of earnings

Accounting research has used several measures to detect whether earnings are free of any bias. We used the level of accrual quality, income smoothing, and accounting conservatism (Francis et al., 2004; Barth et al., 2008)

First, we measured the quality of accruals using the standard deviation of the residuals estimated using the Dechow & Dichev (2002) model modified by McNichols (2002) and Francis et al. (2005):

$$WCA_{it} = \alpha_{0i} + \alpha_{1i}CFO_{it-1} + \alpha_{2i}CFO_{it} + \alpha_{3i}CFO_{it+1} + \alpha_{4i}\Delta REV_{it} + \alpha_{5i}PPE_{it} + \gamma_{it} \quad (2)$$

Where  $WCA_{it} = \Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta DEBT_{it}$

$WCA_{it}$  is the working capital accruals;  $CFO_{it}$  is operating cash flow;  $\Delta REV_{it}$  is the change in revenues;  $PPE_{it}$  is property, plant and equipment;  $\Delta CA_{it}$  is the change in current assets;  $\Delta CL_{it}$  is the change in current liabilities;  $\Delta Cash_{it}$  is the change in the firm's cash and cash equivalents; and  $\Delta DEBT_{it}$  is the change in short term debts.

Accrual quality ( $AQ_{i,t}$ ) is calculated using the residuals from equation (2). This measure is inversely related to faithful representation. It was calculated over a five-year window from t-4 to t as follows:  $AQ_{it} = -\sigma(\gamma_{it})$

Second, following Leuz et al. (2003), we measured income smoothing by the ratio of the standard deviation of net income (normalized per total assets) with the standard deviation of operating cash flows per total assets) as follows:  $SMOOTH_{it} = \frac{\sigma(NI_{it})}{\sigma(CFO_{it})}$

Where  $NI_{it}$  is net income and  $CFO_{it}$  is operating cash flows.

The calculation of the standard deviation was based on a five-year window from  $t-4$  to  $t$ . This measure is an increasing function of the faithful representation of earnings.

Our third proxy for faithful representation is accounting conservatism defined by Basu (1997) as the asymmetry of the incorporation of losses (measured using negative returns) into profits (measured using positive returns) at the outcome level. The Basu (1997) model is presented as follows:

$$EARN_{it} = \varphi_{0i} + \varphi_{1i}LOSS_{it} + \varphi_{2i}RET_{it} + \varphi_{3i}RET_{it} \times LOSS_{it} + \varepsilon_{it} \quad (3)$$

where  $EARN_{it}$  is the net income per share normalized by the total assets of firm  $i$  at date  $t$ ;  $RET_{it}$  is the market return of firm  $i$  for a period of 15 months, 3 months after the end of the fiscal year; and  $LOSS_{it}$  is a dummy variable that takes the value 1 if the net income of firm  $i$  at date  $t$  is negative and takes the value 0 otherwise. In accordance with Basu (1997) and Pope and Walker (1999), conservatism was measured as follows:

$$CONSERV_{it} = \frac{\varphi_{2it} + \varphi_{3it}}{\varphi_{2it}} \quad (4)$$

The coefficients were estimated on a firm-year basis using a rolling regression with a Newey-West<sup>3</sup> estimator over a five-year window from  $t-4$  to  $t^4$ .

We then calculate an aggregate measure of earnings faithful representation by averaging the decile ranking of the different values of the three proxies for each year (assigning class 1 for the lowest values and class 10 for the most important values):

$$AgFaith_{it} = \frac{rAQ_{it} + rSMOOTH_{it} + rCONSERV_{it}}{3}$$

### 3.2.2.2 Earnings relevance

We identified four proxies of earnings relevance: persistence, predictability (based on accounting data), value relevance, and timeliness (based on market data). In accordance with

<sup>3</sup> According to Francis et al. (2004), the rolling approach allows for the presentation of firm-specific data for each period  $t$ . This cannot be valid using the cross-section approach, so we used a Newey-West estimator to address the problem of the autocorrelation of residuals.

<sup>4</sup> We followed Cai et al. (2014) and chose a five-year window.

Francis et al. (2004), persistence was measured using the estimated slope coefficient estimated by the following equation, based on Ali and Zarowin (1992):

$$NI_{it} = \mu_{1i} + \mu_{2i}NI_{it-1} + \varepsilon_{it} \quad (5)$$

where  $NI_{it}$  is the income for firm  $i$  at date  $t$ .

Using the rolling regression methodology, this model was estimated for each firm year. Persistence was detected based on the estimated slope coefficient as follows:

$$PERS_{it} = \mu_{2i}$$

As for predictability, we follow Lipe (1990) who used the variance in earnings shocks. We then calculate the square root of the residual variance estimated from Equation (4).

$$PRED_{i,t} = -\sqrt{\sigma^2(\varepsilon_{i,t})}.$$

The value relevance was estimated using the explanatory power ( $R^2$ ) of Ohlson's (1995) model:

$$R_{it} = \gamma_0 + \gamma_1EPS_{i,t} + \gamma_2\Delta EPS_{i,t} + \varepsilon_{i,t} \quad (6)$$

where  $R_{it}$  is the market return of firm  $i$  for a 15-month period, 3 months after the end of the fiscal year, and  $EPS_{i,t}$  is the earnings per share on the share price at the beginning of the period ( $P_{i,t-1}$ ). This equation was estimated for each firm year using the rolling regression methodology.

The last proxy of earnings relevance is timeliness (*TIMEL*), which refers to the provision of information and news of financial statements on a timely basis (Ball et al., 2000). Timeliness was measured using the explanatory power ( $R^2$ ) of Basu's (1997) model (see Equation (3))

We then calculated the aggregate measure of relevance as the average of the decile ranking of the values calculated for the different proxies each year:

$$AgRelev_{it} = \frac{rPERS_{it} + rPRED_{it} + rRELEV_{it} + rTIMEL_{it}}{4}$$

### 3.2.2.3 Earnings quality

Faithful representation and relevance are complementary because faithful representation increases value if it allows informed investors to make investment decisions. Therefore, we calculated the aggregate measure of earnings quality, including both the faithful

representation and relevance attributes of earnings.  $AgEQ_{it}$  was calculated as the sum of the aggregate measure of faithful representation and relevance.

The proxy is the average of the different ranks attributed to the seven retained proxies of earnings quality for each year (Parte-Esteban & García, 2014):

$$AgEQ_{it} = \frac{rAQ_{it} + rSMOOTH_{it} + rCONSERV_{it} + rPERS_{it} + rPRED_{it} + rRELEV_{it} + rTIMEL_{it}}{7}$$

### 3.2.3 Measures of IFRS adoption: IFRS

*IFRS* is a dummy variable taking the value 1 for the years post-transition, 2006 to 2015, and 0 for the years 2002 to 2004. We also used the "trend-time" measure. The *IFRS\_Trend* variable identifies the number of years following adoption and assesses the variability of the impact of the IFRS throughout the post-adoption period.

### 3.2.4 Control variables

Following previous studies, we included the following variables: firm size (*SIZE*) is the natural logarithm of market capitalization at the beginning of period *t* (Amihud & Mendelson, 1986); the volume of transactions (*VOLUME*) is the natural logarithm of the annual average of number of transactions (Demsetz, 1968; Stoll, 1978; Heflin et al., 2005; Daske et al., 2008); the risk of owning the stock (*VOLAT*) is the standard deviation of daily returns (Heflin & Shaw, 2000; Leuz & Verrecchia, 2000); stock price (*PRICE*) is the natural logarithm of closing price at the end of the year (Leuz & Verrecchia, 2000; Heflin et al., 2005; Daske et al., 2008); analysts' coverage (*ANALYST*) is the natural logarithm of the number of analysts plus one (Brennan & Subrahmanyam, 1996); and the financial crisis (*CRISIS*) is a dummy variable that equals 1 for the years 2008 and 2009 and 0 otherwise. We expected a negative association between the proxies of information asymmetry and firm size, volume of transactions, and price. However, we also expected the association to be positive with volatility and financial crises.

## 3.3 The models' specifications

The research models are specified as follows:

$$AI\_Spread_{it} \text{ or } AI\_SAD_{it} = \alpha_0 + \alpha_1 IFRS_{it} + \alpha_2 VOLAT_{it} + \alpha_3 VOLUME_{it} + \alpha_4 SIZE_{it} + \alpha_5 PRICE_{it} + \alpha_6 ANALYST_{it} + \alpha_7 CRISIS_{it} + \varepsilon_{it} \quad (7)$$

where  $AI\_Spread_{it}$  and  $AI\_SAD_{it}$  are both proxies of information asymmetry measured by the relative bid–ask spread and the adverse selection component, respectively.

We estimate Equation (7) using the ordinary least squares (OLS) estimator. Heteroskedasticity and autocorrelation were corrected by introducing the robust standard error and were clustered at the firm level (Petersen, 2009). To confirm the results, we used the Newey-West estimator. This estimator produces a consistent standard error when there is autocorrelation in addition to heteroskedasticity.

As we assume that the effect of IFRS on information asymmetry is through earnings quality, we used a path analysis that required the specification of the following equations:

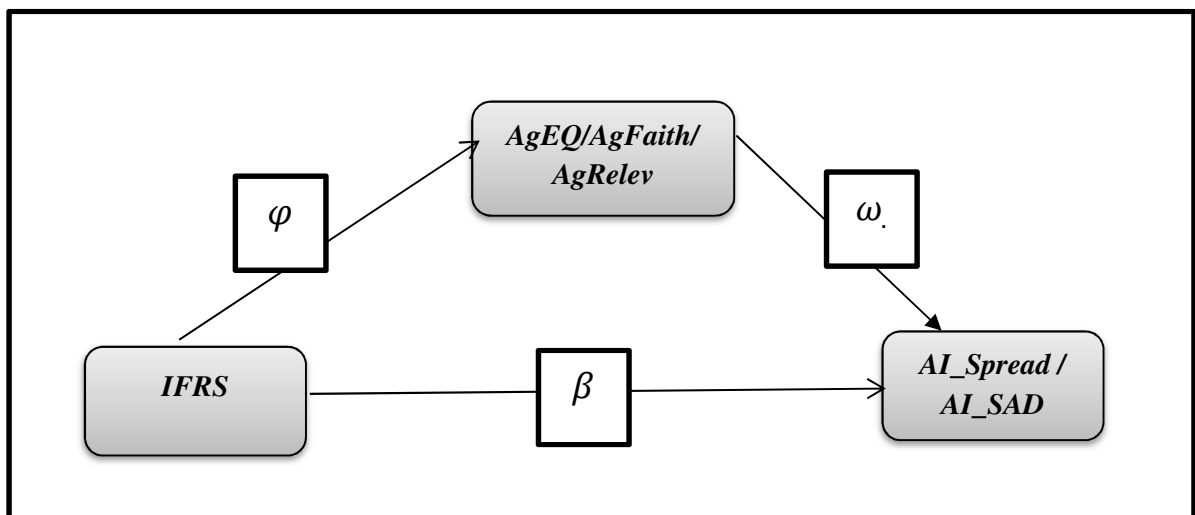
$$AI\_Spread_{it} \text{ or } AI\_SAD_{it} = \alpha_0 + \beta IFRS_{it} + \omega AgEQ_{it} + \alpha_1 VOLUME_{it} + \alpha_2 SIZE_{it} + \alpha_3 PRICE_{it} + \alpha_4 ANALYST_{it} + \alpha_5 CRISIS_{it} + \varepsilon_{it} \quad (8)$$

$$AgEQ_{it} = \gamma_0 + \varphi IFRS_{it} + \sum \gamma_n CONTROLS_{it} + \varepsilon_{it} \quad (9)$$

where  $AgEQ_{it}$  is the aggregated measure of earnings quality.

$CONTROLS_{i,t}$  are control variables including  $SIZE$ ;  $SDCFO$ , the variability of operating cash flows;  $SDSALES$ , the variability of turnover;  $NEG$ ;  $BIG4$ , the presence of an audit by a Big 4 accounting firm;  $LEV$ , the ratio of total liabilities to total assets;  $MTB$ , the firm's growth opportunities; and  $CRISIS$ .

The coefficient  $\beta$  in Equation (8) represents the direct effect of IFRS on the level of information asymmetry after controlling for earnings quality. However, the mediating effect through earnings quality is represented by the interaction between coefficients  $\varphi$  and  $\omega$ , where  $\varphi$  is the effect of the IFRS on earnings quality as estimated in Equation (9), and  $\omega$  is the effect of earnings quality on the level of information asymmetry.



*Figure 2: Basic diagram showing the mediating role of earnings quality in the relationship between the IFRS and information asymmetry*

We use the structural equation modeling approach to simultaneously estimate equations (8) and (9) based on ML estimation. We then use the technique of bootstrapped confidence intervals taken from MacKinnon et al. (2004) to test the null hypothesis of the interaction of coefficients  $\varphi^*\omega$  following Bonsall et al. (2018).

## **4. RESULTS AND DISCUSSION**

### **4.1 Univariate analysis**

Table 2 shows that the mean (median) of the relative bid–ask spread for the French companies was 0.029 (0.012). The adverse selection component, on average, equaled 0.118. The earnings quality measures are on average 6.553 and 3.938 for earnings relevance and faithful representation, respectively. In addition, the companies included in our sample recorded an average market capitalization of more than 243,775 M€, are followed, on average, by six analysts, and have an average annual transaction volume of 107,848.

**[Please Insert Table 2 Here]**

According to Kennedy (1985), a serious multicollinearity issue exists if the correlation coefficient is greater than or equal to 0.7. The correlation matrix between the different variables presented in Table 3 did not reveal correlation coefficients above 0.7, except for earnings quality and earnings relevance (0.883). Thus, we continued the analysis without serious multicollinearity problems that could have biased the results of the subsequent tests (Neter et al., 1996).

**[Please Insert Table 3 Here]**

### **4.2. A multivariate analysis and discussion of the results**

Table 4 presents the results of the effect of IFRS adoption on the level of information asymmetry using OLS estimation, showing a negative and significant relationship between IFRS and the bid–ask spread. The Newey-West estimation confirms the finding that the effect of IFRS remains negative and significant using the adverse selection component as an

alternative proxy for information asymmetry. This finding suggests that IFRS helped reduce information asymmetry. Hence, IFRS can mitigate the risk of adverse selection between informed and uninformed agents. This finding is consistent with Platikanova and Perramon (2012), Neel (2017), and Abad et al. (2018). Table 4 also shows that the number of years following the 2005 regulation further exacerbates the negative association between IFRS and both proxies of information asymmetry, suggesting that the French market continuously improved the level of transparency since the adoption date.

**[Please Insert Table 4 Here]**

As for control variables, transaction volume is a fundamental factor in determining the bid-ask spread, with a significant negative association at the 1% level. The coefficient of analysts' coverage is also negative and significant, suggesting that monitoring by analysts improves the informational environment. As expected, the financial crisis increased information asymmetry.

Table 5 shows the estimation results of the simultaneous equation models used to examine the indirect effect of IFRS on information asymmetry by applying ML estimation in Panel A. Model (1) includes the effects of IFRS on earnings quality. The coefficient of IFRS is significantly negative at the 1% level. This result suggests that earnings quality decreased following the mandatory adoption of IFRS by French companies. Thus, the adoption of IFRS is not associated with high earnings quality in French companies.

**[Please Insert Table 5 Here]**

The coefficient of earnings quality in column (1) of Table 5 is negative and statistically significant at the 1% level, suggesting that earnings quality decreases information asymmetry between informed and uninformed investors. Column (3) of Table 5 shows the same result using the adverse selection component as a measure of information asymmetry. This is consistent with previous studies (Lang et al., 2012; Barth et al., 2013; Bhattacharya et al., 2013). Hence, earnings quality is not a significant driver for the ability of IFRS to reduce the level of information asymmetry.

Table 6 reports the estimation results of the simultaneous equation models of the relationship between IFRS, information asymmetry, and the faithful representation of earnings in Panel A. The results show that IFRS has a positive and significant effect on the



faithful representation of earnings, suggesting that IFRS decreased earnings manipulations. Indeed, IFRS constrained accounting choices (Barth et al., 2008). These findings are consistent with those of previous studies (Barth et al., 2008; Zéghal et al., 2011; Houque et al., 2012).

**[Please Insert Table 6 Here]**

The coefficient of the faithful representation of earnings in column (1) of Table 6 is negative and statistically significant at the 1% level. This means that faithful representation of earnings is associated with a decrease in information asymmetry. Hence, the disclosure of faithful earnings leads to a decrease in the gap between informed and uninformed users and improves the informational environment. The results, presented in Panel B of Table 6, show that the indirect effect through the faithful representation of earnings is negative and significant at the 1% level, providing support for our hypothesis. The bootstrap results indicate that the indirect effect of IFRS on both the bid–ask spread and the adverse selection component is significant at 1% levels. Thus, faithful representation of earnings is a robust channel through which IFRS reduces the level of information asymmetry.

Table 7 shows the results using the earnings relevance measure. Column (2) of Table 7 shows a negative and significant coefficient of IFRS on the relevance of earnings, indicating that the regulation of accounting standards strongly decreased earnings relevance for investors. This finding suggests that the fair value associated with IFRS adoption leads to high volatility and weak relevance of earnings. This result is in line with exiting literature (Ahmed et al., 2013; Elbakry et al., 2017). In addition, the relationship between earnings relevance and information asymmetry, shown in column (1) of Table 7, is negative and statistically significant at the 1% level. Column (3) of Table 7 reports the same result using the adverse selection proxy of information asymmetry. This is consistent with previous studies (Barth et al., 2013).

**[Please Insert Table 7 Here]**

Panel B of Table 7 shows that the indirect effect through earnings relevance is positive and significant at the 1% level. This finding indicates that the relevance of earnings is not a robust channel through which IFRS mitigates information asymmetry.

### **4.3 Robustness checks**

#### *4.3.1 Sub-periods analysis*

The effect of IFRS may have been biased by the financial crisis. Thus, we consider two sub-periods: the first one covers the years 2006 to 2008, which was assigned the dummy variable *IFRS1*, and the second sub-period was from 2009 to 2015, which was assigned the dummy variable *IFRS2*. Table 8 shows a negative and significant coefficient of *IFRS1* at the 1% level, suggesting that IFRS decreased information asymmetry in the years preceding the financial crisis. The coefficient of *IFRS 2* was also negative and significant. This means that the effect of IFRS on information asymmetry was not biased by the crisis.

**[Please Insert Table 8 Here]**

#### 4.3.2 Alternative measure of information asymmetry

We use the error of the earnings per share (EPS) forecast as an alternative proxy for information asymmetry. It was calculated as the absolute value of the difference between the consensus of the EPS forecast and the current EPS scaled by the stock price. Data were collected from the I/B/E/S database. Following Horton et al. (2013), we chose analysts' forecasts that ended three months before the end of the fiscal year. The specification of the model is as follows:

$$ERROR_{it} = \mu_0 + \mu_1 IFRS_{it} + \mu_2 ANALYST_{it} + \mu_3 SIZE_{it} + \mu_4 LEV_{it} + \mu_5 ROA_{it} + \mu_6 LOSS_{it} + \mu_7 CRISIS_{it} + \mu_8 HORIZONS_{it} + \varepsilon_{it} \quad (10)$$

where *ROA* is the profitability measured by return on assets and *HORIZONS* is the forecast horizon that is equal to the number of days between the forecast at the end of the fiscal year. All other variables are defined previously in the text and in the Appendix.

Table 9 shows a negative effect of IFRS on *ERROR*, as a proxy of information asymmetry. The results remain then qualitatively unchanged.

**[Please Insert Table 9 Here]**

Table 10 displays the results of the simultaneous equation models using ML estimation. Panel A of Table 10 shows that errors in analyst forecasts are not affected by earnings quality. The results also show that only faithful representation is a significant determinant of analyst forecast accuracy. The results in Panel B of Table 10 support our findings and show that faithful representation is a robust channel for IFRS adoption to improve the informational environment.

**[Please Insert Table 10 Here]**

### *4.3.3 Alternative measures of faithful representation and relevance aggregates*

In 2005, the IASB declared that conservatism is a non-desirable quality in accounting. Timeliness as a proxy for relevance is another concern. Indeed, timeliness is generally perceived as an implicit characteristic of value relevance. Therefore, we reran our regressions by removing the attributes of conservatism and timeliness from the faithful representation and relevance aggregates, respectively. Table 11 shows that our major findings were not affected by these alternative measures.

**[Please Insert Table 11 Here]**

## **5. Conclusion**

The purpose of this study is to investigate the relationship between IFRS adoption and the level of information asymmetry. This study also examined the indirect effect of IFRS on information asymmetry through the earnings quality channel. Based on a sample of French listed companies from 2002 to 2015, the findings show that information asymmetry, measured by the bid–ask spread and the adverse selection component, decreases significantly after IFRS adoption. This decrease was found to be more prevalent in the later years after adoption. To further investigate this effect, we performed a path analysis and tested whether earnings quality is the channel through which IFRS negatively affected information asymmetry.

We used an aggregate earnings quality measure including faithful representation and relevance as fundamental qualitative characteristics. The ML estimations showed that IFRS reduces earnings quality, which is not found to be the channel that mitigates information asymmetry under IFRS adoption. Our results also showed that the decrease in earnings quality was due to a decrease in earnings relevance after IFRS adoption. However, IFRS was shown to improve the faithful representation of earnings, which is a robust channel through which IFRS can mitigate information asymmetry. This finding is inconsistent with Neel (2017), who asserted that faithful representation of earnings has a marginal effect on the level of information asymmetry. Our findings are robust, as we used alternative measures of information asymmetry, earnings quality aggregates, and sub-period analyses.

Future research should focus on other channels that may explain the indirect relationship between IFRS and information asymmetry, such as accounting comparability, corporate governance, and enforcement change. Institutional, cultural, and firm incentives regarding earnings quality may also further clarify this relationship.

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**Table 1**



Industry distribution according to the Industry Classification Benchmark (ICB)

ICB Name	Observations	Number of Companies	Percent %	% Cum.
Basic Materials	208	16	5.73	5.73
Consumer Goods	741	57	20.43	26.16
Consumer Services	637	49	17.56	43.73
Health Care	169	13	4.66	48.39
Industrials	832	64	22.94	71.33
Oil & Gas	91	7	2.51	73.84
Technology	806	62	22.22	96.06
Telecommunications	39	3	1.08	97.13
Utilities	104	8	2.87	100
<b>Total</b>	<b>3627</b>	<b>279</b>	<b>100</b>	

**Table 2**

Descriptive statistics

<b>Variables</b>	<b>Mean</b>	<b>SD</b>	<b>Q10</b>	<b>Q25</b>	<b>Median</b>	<b>Q75</b>	<b>Q90</b>
<i>AI_Spread</i>	0.029	0.051	0.001	0.004	0.012	0.027	0.073
<i>AI_SAD</i>	0.118	0.113	0.017	0.042	0.088	0.154	0.246
<i>AgEQ</i>	5.287	0.716	4.334	4.865	5.338	5.710	6.102
<i>AgFaith</i>	3.938	0.857	3.164	3.547	3.800	4.184	4.913
<i>AgRelev</i>	6.553	1.329	4.706	5.711	6.738	7.556	8.099
<i>VOLAT</i>	0.025	0.014	0.013	0.016	0.021	0.029	0.041
<i>VOLUME</i>	107848	313730	1164	3106	11591	52418	270222
<i>SIZE</i>	12.404	2.371	9.439	10.654	12.184	13.976	15.884
<i>PRICE</i>	56.463	149.647	2.481	6.641	20.060	47.850	96.100
<i>ANALYST</i>	1.831	1.529	0.000	0.000	1.693	3.303	3.996

Note: All Variables definitions are in the Appendix.

**Table 3**

## Pearson Correlation Matrix

	<i>AI_Spread</i>	<i>AI_SAD</i>	<i>IFRS</i>	<i>AgEQ</i>	<i>AgFaith</i>	<i>AgRelev</i>	<i>VOLAT</i>	<i>VOLUME</i>	<i>SIZE</i>	<i>PRICE</i>	<i>ANALYST</i>
<i>AI_Spread</i>	1										
<i>AI_SAD</i>	0.4033*	1									
<i>IFRS</i>	-0.1408*	-0.0843*	1								
<i>AgEQ</i>	-0.0324*	-0.0469	0.0453	1							
<i>AgFaith</i>	-0.2505*	-0.0542	0.0885*	0.4390*	1						
<i>AgRelev</i>	-0.1457*	-0.0931*	-0.1055*	0.8076*	0.1753*	1					
<i>VOLAT</i>	0.4882*	0.1839*	-0.1268*	-0.0217	-0.2008*	0.1106*	1				
<i>VOLUME</i>	-0.7596*	-0.3325*	0.0360	0.0833*	0.2308*	0.0924*	-0.2221*	1			
<i>SIZE</i>	-0.1961*	-0.1155*	0.0766*	0.0241	0.0193	0.0158	-0.1461*	0.1766*	1		
<i>PRICE</i>	-0.0616*	0.0190	0.0471*	0.0203	0.0031	0.0249	-0.0663*	-0.0567*	0.0166	1	
<i>ANALYST</i>	-0.3395*	-0.1712*	0.0160	0.0345	0.1738*	0.0980*	-0.1210*	0.3081*	0.2398*	0.0872*	1
<i>CRISIS</i>	0.0568*	0.0053	0.2335*	0.0701*	0.0279	0.1445*	0.1964*	0.0173	0.0383	0.0300	0.0239

Notes: All Variables definitions are in the Appendix. \* The significance level at 5%.

**Table 4**

IFRS effects on information asymmetry

VARIABLES	<i>AI_Spread</i>			<i>AI_SAD</i>		
	(1) <i>OLS</i>	(2) <i>Newey- West</i>	(3) <i>OLS</i>	(4) <i>OLS</i>	(5) <i>Newey- West</i>	(6) <i>OLS</i>
<i>IFRS</i>	-0.317*** (0.045)	-0.316*** (0.033)		-0.152** (0.072)	-0.150** (0.069)	
<i>IFRS_Trend</i>			-0.026*** (0.006)			-0.006** (0.009)
<i>VOLAT</i>	32.360*** (2.866)	32.858*** (1.382)	33.223*** (2.791)	8.181*** (2.160)	8.538*** (1.833)	8.522*** (2.150)
<i>VOLUME</i>	-0.473*** (0.026)	-0.464*** (0.009)	-0.471*** (0.026)	-0.128*** (0.018)	-0.121*** (0.015)	-0.129*** (0.018)
<i>SIZE</i>	-0.004 (0.019)	-0.008 (0.007)	-0.006 (0.019)	-0.011 (0.017)	-0.014 (0.012)	-0.012 (0.016)
<i>PRICE</i>	-0.009 (0.029)	-0.002 (0.010)	-0.013 (0.029)	0.022 (0.027)	0.036* (0.021)	0.019 (0.027)
<i>ANALYST</i>	-0.102*** (0.029)	-0.112*** (0.011)	-0.103*** (0.029)	-0.064** (0.029)	-0.068*** (0.022)	-0.064** (0.029)
<i>CRISIS</i>	0.044 (0.038)	0.042 (0.044)	-0.074** (0.035)	0.042 (0.075)	0.043 (0.083)	-0.012 (0.070)
Constant	-0.367 (0.363)	-0.005 (0.166)	-0.489 (0.357)	-1.261*** (0.323)	-0.993*** (0.343)	-1.327*** (0.323)
<i>Observations</i>	3,627	3,627	3,627	3,534	3,534	3,534
<i>R-squared</i>	0.710		0.706	0.135		0.132
<i>Industry Effect</i>	YES	YES	YES	YES	YES	YES
<i>F-Statistic</i>	105.12	510.1	95.36	14.47	16.54	14.19

Notes: Table 4 presents the results of the OLS and Newey-west regressions. All Variables definitions are in Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 5**

IFRS effects on information asymmetry: The mediating effect of earnings quality

**Panel A. ML estimations using AgEQ as a mediating variable**

VARIABLES	(Model 1)		(Model 2)	
	<i>AI_Spread</i>	<i>AgEQ</i>	<i>AI_SAD</i>	<i>AgEQ</i>
<i>IFRS</i>	-0.321*** (0.036)	-0.169*** (0.034)	-0.238*** (0.073)	-0.200*** (0.051)
<i>AgEQ</i>	-0.035** (0.020)		-0.122*** (0.044)	
<i>VOLAT</i>	33.947*** (1.615)		7.198*** (2.339)	
<i>VOLUME</i>	-0.478*** (0.010)		-0.138*** (0.016)	
<i>PRICE</i>	0.014 (0.009)		0.038*** (0.002)	
<i>ANALYST</i>	-0.090*** (0.012)		-0.061** (0.025)	
<i>SIZE</i>	-0.009 (0.007)	0.020** (0.008)	-0.001 (0.013)	0.007** (0.012)
<i>SDCFO</i>		-1.772*** (0.327)		-1.687*** (0.452)
<i>SDSALES</i>		-0.041 (0.116)		0.128 (0.168)
<i>NEG</i>		-0.188*** (0.062)		-0.256*** (0.065)
<i>BIG4</i>		-0.027 (0.029)		-0.040 (0.038)
<i>LEV</i>		-0.170** (0.083)		-0.148 (0.132)
<i>MTB</i>		-0.004 (0.009)		0.002 (0.015)
<i>CRISIS</i>	0.051* (0.045)	0.141*** (0.026)	0.071 (0.089)	0.102* (0.057)
Constant	0.206 (0.195)	6.034*** (0.162)	0.662* (0.340)	5.692*** (0.238)
<i>Observations</i>	3,172	3,172	3,172	3,172
<i>R-Squared</i>	0.689	0.224	0.108	0.228
<i>Industry effects</i>	Yes	Yes	Yes	Yes

**Panel B. Earnings quality Mediating Effect**

	<i>Bootstrap Method</i>			
	<i>AI_Spread</i>		<i>AI_SAD</i>	
	<i>Coeff</i>	<i>Bootstrap Z</i>	<i>Coeff</i>	<i>Bootstrap Z</i>
<b>Direct Path</b>				
<i>IFRS==&gt;AI</i>	-0.321***	-8.68	-0.238***	-3.54
<b>Mediated Path</b>				
<i>I. IFRS==&gt; AgEQ</i>	-0.169***	-4.82	-0.200***	-4.32
<i>II. AgEQ==&gt;AI</i>	-0.035***	-1.70	-0.122***	-3.66
<b>Indirect effect</b>				
<i>I×II</i>	0.006***	1.55	0.03***	3.09
<b>Total Effect</b>	-0.315***	-8.67	-0.201***	-4.19

Notes: Table 5 reports the regression results using the Maximum likelihood estimation in Panel A. Panel B displays results of the indirect effect through earnings quality using the Bootstrap method. All Variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 6**

IFRS effects on information asymmetry: The mediating effect of faithful representation

**Panel A. ML estimations using AgFaith as a mediating variable**

VARIABLES	(Model 1)		(Model 2)	
	<i>AI_Spread</i>	<i>AgFaith</i>	<i>AI_SAD</i>	<i>AgFaith</i>
<i>IFRS</i>	-0.342*** (0.040)	0.235*** (0.040)	-0.196*** (0.066)	0.228*** (0.054)
<i>AgFaith</i>	-0.090*** (0.018)		-0.076** (0.041)	
<i>VOLAT</i>	32.974*** (1.519)		8.711*** (2.317)	
<i>VOLUME</i>	-0.472*** (0.011)		-0.141*** (0.016)	
<i>PRICE</i>	0.014 (0.008)		-0.000 (0.014)	
<i>ANALYST</i>	-0.085*** (0.013)		0.032 (0.020)	
<i>SIZE</i>	-0.011 (0.007)	0.131*** (0.010)	-0.063*** (0.024)	0.126*** (0.012)
<i>SDCFO</i>		-1.073*** (0.340)		-1.416*** (0.379)
<i>SDSALES</i>		0.083 (0.140)		0.162 (0.206)
<i>NEG</i>		0.318*** (0.052)		0.314*** (0.076)
<i>BIG4</i>		0.040 (0.031)		0.003 (0.044)
<i>LEV</i>		-0.036 (0.092)		0.097 (0.121)
<i>MTB</i>		-0.003 (0.012)		-0.004 (0.015)
<i>CRISIS</i>	0.065 (0.047)	-0.132*** (0.044)	0.036 (0.108)	-0.161** (0.067)
Constant	-0.765*** (0.153)	6.447*** (0.193)	1.039*** (0.284)	6.237*** (0.223)
<i>Observations</i>	3,172	3,172	3,172	3,172
<i>R-Squared</i>	0.721	0.399	0.120	0.462
<i>Industry Effect</i>	Yes	Yes	Yes	Yes

**Panel B. Earnings faithful representation mediating effect**

	<i>Bootstrap Method</i>			
	<i>AI_Spread</i>		<i>AI_SAD</i>	
	<i>Coeff</i>	<i>Bootstrap Z</i>	<i>Coeff</i>	<i>Bootstrap Z</i>
<b>Direct Path</b>				
<i>IFRS==&gt;AI</i>	-0.342***	-11.33	-0.196***	-2.85
<b>Mediated Path</b>				
<i>I. IFRS==&gt; AgFaith</i>	0.235***	5.48	0.228***	4.18
<i>II. AgFaith==&gt;AI</i>	-0.090**	-4.50	-0.076**	-2.86
<b>Indirect effect</b>				
<i>I×II</i>	-0.021***	-3.84	-0.017**	-2.42
<b>Total Effect</b>	-0.363***	-11.67	-0.213***	-4.09

Notes: Table 6 shows the regression results in Panel A. Panel B displays results of the indirect effect through earnings faithful representation using the Bootstrap method. All Variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 7**

IFRS effects on information asymmetry: The mediating effect of earnings relevance

**Panel A. ML estimations using *AgRelev* as a mediating variable**

VARIABLES	(Model 1)		(Model 2)	
	<i>AI_Spread</i>	<i>AgRelev</i>	<i>AI_SAD</i>	<i>AgRelev</i>
<i>IFRS</i>	-0.357*** (0.034)	-0.587*** (0.054)	-0.031*** (0.007)	-0.597*** (0.054)
<i>AgRelev</i>	-0.067*** (0.011)		-0.011*** (0.002)	
<i>VOLAT</i>	31.275*** (1.373)		1.935*** (0.237)	
<i>VOLUME</i>	-0.464*** (0.009)		-0.012*** (0.001)	
<i>PRICE</i>	0.000 (0.010)		0.006*** (0.002)	
<i>ANALYST</i>	-0.110*** (0.011)		-0.006*** (0.002)	
<i>SIZE</i>	-0.005 (0.007)	0.094*** (0.012)	(0.001) -0.001	0.088*** (0.012)
<i>SDCFO</i>		-2.273*** (0.479)		-2.337*** (0.479)
<i>SDSALES</i>		-0.060 (0.182)		-0.039 (0.179)
<i>NEG</i>		-0.392*** (0.077)		-0.391*** (0.077)
<i>BIG4</i>		-0.035 (0.048)		-0.035 (0.047)
<i>LEV</i>		-0.233* (0.123)		-0.212* (0.123)
<i>MTB</i>		-0.013 (0.013)		-0.014 (0.013)
<i>CRISIS</i>	0.099** (0.048)	0.652*** (0.061)	0.009 (0.008)	0.660*** (0.060)
Constant	-0.003 (0.142)	5.410*** (0.260)	0.179*** (0.028)	5.509*** (0.252)
<i>Observations</i>	3,172	3,172	3,172	3,172
<i>R-Squared</i>	0.701	0.112	0.107	0.118
<i>Industry Effect</i>	Yes	Yes	Yes	Yes

**Panel B. Earnings relevance mediating effect**

	Bootstrap Method			
	<i>AI_Spread</i>		<i>AI_SAD</i>	
	Coeff	Bootstrap Z	Coeff	Bootstrap Z
<b>Direct Path</b>				
<i>IFRS</i> ==> <i>AI</i>	-0.357***	-10.50	-0.031***	-2.84
<b>Mediated Path</b>				
I. <i>IFRS</i> ==> <i>AgRelev</i>	-0.587***	-10.01	-0.597***	2.61
II. <i>AgRelev</i> ==> <i>AI</i>	-0.067***	-6.63	-0.011***	-7.93
<b>Indirect effect</b>				
I×II	0.034***	5.69	-0.004***	-2.73
<b>Total Effect</b>	-0.318***	-9.62	-0.030***	-2.99

Notes: Table 7 reports the regression in Panel A. Panel B displays results of the indirect effect through earnings relevance using Bootstrap method. All variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 8**

IFRS effects on information asymmetry: Sub-periods analysis

VARIABLES	<i>AI_Spread</i>		<i>AI_SAD</i>	
	<i>OLS</i>		<i>OLS</i>	
<i>IFRS1</i>	-0.626***	(0.084)	-0.181**	(0.091)
<i>IFRS2</i>	-0.296***	(0.078)	-0.142*	(0.074)
<i>VOLAT</i>	32.816***	(2.899)	8.144***	(2.161)
<i>VOLUME</i>	-0.471***	(0.026)	-0.129***	(0.018)
<i>SIZE</i>	-0.003	(0.019)	-0.011	(0.017)
<i>PRICE</i>	-0.011	(0.029)	0.022	(0.027)
<i>ANALYST</i>	-0.098***	(0.028)	-0.063**	(0.029)
<i>CRISIS</i>	0.267***	(0.058)	0.051	(0.078)
Constant	-0.486	(0.358)	-1.259***	(0.323)
<i>Observations</i>	3,627		3,534	
<i>R-squared</i>	0.718		0.135	
<i>Industry Effect</i>	YES		YES	
<i>F-Statistic</i>	76.65		13.94	

Notes: Table 8 reports the regression results of IFRS sub-periods effects on information asymmetry. All variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.



**Table 9**

Alternative measure of information asymmetry

	(1)	(2)	(3)	(4)
<b>VARIABLES</b>	<b>ERROR</b>		<b>ERROR-INDeflated</b>	
<i>IFRS</i>	-0.028*** (0.010)		-0.434*** (0.151)	
<i>IFRS_Trend</i>		-0.003*** (0.001)		-0.043*** (0.015)
<i>ANALYST</i>	-0.013*** (0.003)	-0.013*** (0.003)	-0.418*** (0.060)	-0.425*** (0.057)
<i>SIZE</i>	-0.000 (0.001)	-0.000 (0.001)	0.187*** (0.028)	0.186*** (0.026)
<i>LEV</i>	0.000*** (0.000)	0.000*** (0.000)	-0.002 (0.002)	-0.002 (0.002)
<i>ROA</i>	-0.003*** (0.001)	-0.003*** (0.001)	-0.013** (0.006)	-0.012* (0.006)
<i>LOSS</i>	0.058*** (0.008)	0.058*** (0.008)	0.664*** (0.116)	0.709*** (0.112)
<i>CRISIS</i>	0.005 (0.008)	-0.012 (0.008)	0.113 (0.104)	-0.149 (0.107)
<i>HORIZONS</i>	0.000 (0.002)	0.000 (0.002)	-0.007 (0.041)	-0.007 (0.041)
Constant	0.064 (0.131)	0.061 (0.129)	-1.655 (3.083)	-1.688 (3.079)
<i>Observations</i>	2,672	2,672	2,672	2,672
<i>R-squared</i>	0.299	0.300	0.148	0.153
<i>Industry Effect</i>	Yes	Yes	Yes	Yes
<i>F-statistic</i>	10.72	11.10	8.255	9.286

Notes: Table 9 presents the regression results of IFRS effects on earnings forecast errors. All Variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 10**

Mediating effects with alternative measure of information asymmetry

<b>Panel A. ML estimations</b>						
<b>VARIABLES</b>	<b>(Model 1)</b>		<b>(Model 2)</b>		<b>(Model 3)</b>	
	<b>ERROR</b>	<b>AgEQ</b>	<b>ERROR</b>	<b>AgFaith</b>	<b>ERROR</b>	<b>AgRelev</b>
<i>IFRS</i>	-0.136** (0.054)	-0.168*** (0.056)	-0.124** (0.060)	0.285*** (0.052)	-0.129** (0.053)	-0.456*** (0.075)
<i>AgEQ</i>	-0.033 (0.0270)					
<i>AgFaith</i>			-0.072** (0.028)			
<i>AgRelev</i>					-0.014 (0.017)	
<i>Observations</i>	2,053	2,053	2,053	2,053	2,053	2,053
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Industry Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes
<b>Panel B. Earnings Quality mediating effect</b>						
<b>Bootstrap Method</b>						
	<i>AgEQ</i>		<i>AgFaith</i>		<i>AgRELEV</i>	
	<i>Coeff</i>	<i>Bootstrap Z</i>	<i>Coeff</i>	<i>Bootstrap Z</i>	<i>Coeff</i>	<i>Bootstrap Z</i>
<b>Direct Path</b>						
<i>IFRS==&gt;ERROR</i>	-0.136**	-4.50	-0.124**	-2.64	-0.129**	-2.54
<b>Mediated Path</b>						
<i>I. IFRS==&gt; earnings quality</i>	-0.168***	-8.11	0.285***	9.33	-0.456***	-7.85
<i>II. earnings quality ==&gt;AI</i>	-0.033	-0.63	-0.072**	-4.93	-0.014	0.85
<b>Indirect effect</b>						
<i>I×II</i>	0.005	0.304	-0.020**	-2.32	0.006	0.517
<b>Total Effect</b>	-0.131**	-4.88	-0.144**	-4.23	-0.123**	-4.21

Notes: Table 10, Panel A reports the regression results using the Maximum likelihood estimation. Panel B displays results of the indirect effect using the Bootstrap method. All Variables definitions are in the Appendix. All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

**Table 11**

IFRS effects on information asymmetry: The mediating effect of alternative measure of earnings faithful representation and relevance

<b>Panel A. ML estimations</b>				
VARIABLES	(Model 1)		(Model 2)	
	<i>AI_Spread</i>	<i>AgFaith2</i>	<i>AI_Spread</i>	<i>AgRelev2</i>
<i>IFRS</i>	-0.342*** (0.044)	0.336*** (0.058)	-0.351*** (0.035)	-0.586*** (0.048)
<i>AgFaith2</i>	-0.090*** (0.023)			
<i>AgRelev2</i>			-0.067*** (0.011)	
<i>VOLAT</i>	32.974*** (1.602)		30.773*** (1.382)	
<i>VOLUME</i>	-0.472*** (0.010)		-0.465*** (0.008)	
<i>PRICE</i>	0.014 (0.010)		0.006 (0.009)	
<i>ANALYST</i>	-0.085*** (0.013)		-0.104*** (0.012)	
<i>SIZE</i>	-0.011* (0.007)	0.177*** (0.013)	(0.008) -0.011**	0.101*** (0.013)
<i>SDCFO</i>		-1.753*** (0.362)		-3.099*** (0.483)
<i>SDSALES</i>		-0.041 (0.142)		-0.017 (0.182)
<i>NEG</i>		0.540*** (0.075)		-0.623*** (0.066)
<i>BIG4</i>		0.026 (0.033)		-0.115** (0.052)
<i>LEV</i>		-0.093 (0.126)		-0.403*** (0.134)
<i>MTB</i>		-0.001 (0.012)		0.007 (0.014)
<i>CRISIS</i>	0.065 (0.048)	-0.199*** (0.051)	0.084* (0.047)	0.466*** (0.049)
Constant	-0.765*** (0.176)	8.769*** (0.249)	0.074 (0.129)	5.460*** (0.291)
<i>Observations</i>	3,172	3,172	3,172	3,172
<i>R-Squared</i>	0.740	0.398	0.714	0.154
<i>Industry Effects</i>	Yes	Yes	Yes	Yes

<b>Panel B. Earnings Quality mediating effect</b>				
	<b>Bootstrap Method</b>			
	<i>AgFaith2</i>		<i>AgRelev2</i>	
	<i>Coeff</i>	<i>Bootstrap Z</i>	<i>Coeff</i>	<i>Bootstrap Z</i>
<b>Direct Path</b>				
<i>IFRS==&gt;AI</i>	-0.342***	-10.50	-0.351***	-8.84
<b>Mediated Path</b>				
<i>I. IFRS==&gt;AgFaith2/AgRelev2</i>	0.336***	9.01	-0.586***	-4.61
<i>II. AgFaith2/AgRelev2==&gt;AI</i>	-0.090***	-10.13	-0.067***	-7.93
<b>Indirect effect</b>				
<i>I×II</i>	-0.003***	-5.99	0.003***	5.73
<b>Total Effect</b>	-0.345***	-9.62	-0.348***	-7.99

Notes: Table 11, Panel A reports the regression results using the Maximum likelihood estimation. Panel B displays results of the indirect effect using the Bootstrap method. All Variables definitions are in the Appendix.

All continuous variables were winsorized from 1 to 99 percent. Robust Standard errors clustered at the firm level are in brackets. \*\*\*, \*\*, \* indicate the significance of 0.01, 0.05, and 0.10 levels, respectively.

## Appendix. Variables definitions

<i>Variable</i>	<i>Definition</i>
<i>Dependent Variables</i>	
<i>AI_Spread<sub>it</sub></i>	The natural logarithm of the relative bid–ask spread $(\frac{ASK_{it}-BID_{it}}{(ASK_{it}+BID_{it})/2})$ .
<i>AI_SAD<sub>it</sub></i>	The adverse selection component estimated using Lin et al. (1995) model.
<i>ERROR<sub>it</sub></i>	Absolute value of the difference between the consensus of the EPS forecast and the current EPS scaled by the stock price.
<i>ERROR-INDeflated<sub>it</sub></i>	Error forecasts not normalized by stock price.
<i>Test Variables</i>	
<i>IFRS</i>	Dummy variable that equals 1 for the years post-adoption (2006 to 2015), and 0 for the years 2002 to 2004.
<i>IFRS_Trend</i>	Number of years following first adoption.
<i>IFRS1</i>	Dummy variable equal to 1 for years 2006 to 2008, and 0 otherwise.
<i>IFRS2</i>	Dummy variable equal to 1 for years 2009 to 2015, and 0 otherwise.
<i>Mediating variables</i>	
<i>AgFaith<sub>it</sub></i>	Aggregate measure of earnings faithful representation calculated by the average decile rankings of the sum of <i>AQ<sub>it</sub></i> , <i>SMOOTH<sub>it</sub></i> , and <i>CONSERV<sub>it</sub></i> .
<i>AQ<sub>it</sub></i>	The accruals quality is the standard deviation of the residuals estimated from the Dechow and Dichev (2002) model and modified by Francis et al. (2005).
<i>SMOOTH<sub>it</sub></i>	Income smoothing is the variability of net income on the variability of cash flows (Leuz et al. (2003).
<i>CONSERV<sub>it</sub></i>	Accounting conservatism is estimated using Basu's (1997) model.
<i>AgRelev<sub>it</sub></i>	Aggregate measure of earnings relevance calculated by the average the decile ranking of the sum of <i>PERS<sub>it</sub></i> , <i>PRED<sub>it</sub></i> , <i>RELEV<sub>it</sub></i> , and <i>TIMEL<sub>it</sub></i> .
<i>PERS<sub>it</sub></i>	Earnings persistence refers to the estimated slope coefficient of Ali and Zarowin's (1992) model.
<i>PRED<sub>it</sub></i>	Earnings predictability is calculated as the square root of the residual variance estimated using Ali and Zarowin's (1992) model.
<i>RELEV<sub>it</sub></i>	Earnings value-relevance is estimated using the explanatory power of Ohlson's model (1995).
<i>TIMEL<sub>it</sub></i>	Timeliness is estimated using the explanatory power of Basu's (1997) model.
<i>AgEQ<sub>it</sub></i>	Aggregate measure of earnings quality including the aggregate measures of faithful representation and relevance of earnings.
<i>AgFaith2<sub>it</sub></i>	Aggregate of earnings faithful presentation calculated by excluding accounting conservatism measure.
<i>AgRelev2<sub>it</sub></i>	Aggregate of earnings relevance calculated by excluding timeliness
<i>Control variables</i>	
<i>SIZE<sub>it</sub></i>	Natural logarithm of market capitalization at the beginning of period t.

<i>VOLUME<sub>it</sub></i>	Natural logarithm of the annual average of the number of transactions.
<i>VOLAT<sub>it</sub></i>	Standard deviation of daily returns.
<i>PRICE<sub>it</sub></i>	Natural logarithm of the closing price at the end of the year t.
<i>CRISIS</i>	Dummy variable that equals 1 for the years 2008 and 2009, and 0 otherwise.
<i>SDCFO<sub>it</sub></i>	The standard deviation of operating cash flows from t-4 to t.
<i>SDSALES<sub>it</sub></i>	The standard deviation of sales from t-4 to t.
<i>BIG4<sub>it</sub></i>	Dummy variable that equals 1 if firm has audit by a Big 4 accounting firm and, 0 otherwise.
<i>LEV<sub>it</sub></i>	Ratio of total liabilities to total assets.
<i>MTB<sub>it</sub></i>	Firm's growth opportunities calculated by the ratio of market capitalization on total assets.
<i>ANALYST<sub>it</sub></i>	Natural logarithm of the number of analysts plus one.
<i>ROA<sub>it</sub></i>	Return on asset ratio.
<i>LOSS<sub>it</sub></i>	Dummy variable that equals 1 if the net income is negative, and 0 otherwise.
<i>HORIZONS<sub>it</sub></i>	Forecast horizon equal to the number of days between the forecast and the end of the fiscal year t.

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