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The effect of IFRS mandatory adoption on the information asymmetry

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Abstract: This paper examines whether the mandatory adoption of IFRS/IAS in the European Union is beneficial in terms of the information content of earnings. The informational relevance of earnings was reflected by the level of information asymmetry measured by the cost of capital and the financial analysts' forecasts. So, the article purpose is to study the impact of IFRS adoption on the cost of capital and on the financial analysts' forecasts. Using an unbalanced panel data of firm—year observations spanning from 2002 to 2012, we hypothesize and empirically find the following. First, IFRS adoption represents a key determinant of information asymmetry reduction, as it contributes significantly to the decrease in the capital cost for the post-IFRS period. Second, the adoption of these international standards has significantly contributed to the improvement of financial analysts' forecasts reflected by an enhancement of the forecasts properties, a decrease in dispersion and error. The results contribute to the literature dealing with the additional informational content stemming from IFRS mandatory adoption. The originality of this study consists primarily in the use of a long analysis period which eliminates any bias relating to the period of learning and understanding of IFRS and any bias related to the financial crisis started in 2007 and secondly in the use of two measurements of information asymmetry which makes the results obtained more robust.

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PUBLIC INTEREST STATEMENT

Most countries adopt a set of accounting standards in preparing the financial statements. These standards are different from one country to another because they are generally dependent on its specific legal, economic, and social context. The divergence of accounting standards makes the comparison of financial statements of companies very difficult and even impossible in a context characterized by an increasing internationalization of markets and businesses. This highlights the need for international accounting harmonization. The European Union has engaged in standardization of accounting standards by requiring its listed member states the application of International Financial Reporting Standards (IFRS) at the beginning of 2005. Indeed, given the particularity of the French context, this article focuses on this environment. It analyses the additional informational content of IFRS through their impact on the information asymmetry measured by the cost of capital and the properties of financial analysts' forecasts.

1. Introduction

International openness is a source of proliferation of existing relationships between the different stakeholders of the company where each relationship can be characterized by an information asymmetry. Solving problems of information asymmetry requires the establishment of means of control. One of these means is the obligation of production and disclosure of accounting and financial information that reflect the true financial position of a company. Financial reporting can represent a source of reducing information asymmetry. This latter aim requires reliable, relevant, and comparable financial information. So, it is necessary to provide a regulatory framework at the international level for the publication of financial information in order to properly assist to decision-making.

According to Philippe Danjou, Chief of Accountant business in the Financial Markets Authority (AMF), the adoption of new accounting standards IFRS introduced a new estimation philosophy and upgrading business performance. They have a considerable impact on the financial reporting and they change the meaning and the significance of several indicators used by investors. This impact is in terms of quality and quantity of information disclosed. Dicko and Khemakhem (2010) stipulate that the IFRS adoption has been certainly a source of increasing the amount of information disclosed, (in terms of frequency and number of published financial statements). But, even if the superiority of IFRS relating to the amount of information disclosed was undeniable, previous work showed two divergent reflections concerning the information disclosed quality. On one hand, some researchers consider that IFRS improve the information content of accounting numbers because they lead companies to disclose more and better information and limit discretionary accounting choices. On the other hand, others consider that IFRS adoption is likely to reduce the information content of accounting numbers because it limits the number of authorized accounting policies.

Indeed, the IFRS standards require high quality, transparent and comparable information in financial statements and other reports to help investors in all global markets and other users to make economic decisions (Epstein & Mirza, 1999). This postulate is in line with the main objective of these new standards. To do this, IFRS are based on a new and important principle; the fair value instead of historical cost.

The fair value facilitates decision-making of investors who are always looking for latest information (Ball, 2006). According to this author, the market value; because it synthesizes the latest expectations of various economic agents, is incomparably more informative than historical cost. This view is widely defended by Mistral (2003) which states that the principle of fair value is certainly more useful and appropriate to measure assets and liabilities than historical cost.

This principle permits to provide relevant information about financial instruments because it allows to reflect company events and economic conditions timely and to provide a good basis for analysis and forecasting of future cash flows. According to the IASB, it offers to users of the financial statements, the ability to appreciate the consequences of investment and funding strategies undertaken by a firm. From then, the principle of fair value used in the preparation of financial statements is expected to increase the quality and the relevance of the accounting numbers produced.

Several previous studies have been interested in the effect of IFRS on the quality of published accounting numbers. These studies highlighted the need for further exploration of this impact for various reasons. First, the results do not show unanimity. Second, the majority of previous studies have researched the effect of IFRS on earnings quality focusing on changes in the properties of earnings (e.g. earnings management) or on investor responsiveness to earnings. Third, the study periods post-IFRS adoption is fairly short which can generate biased results by the effect of learning and

understanding of these standards newly introduced. This study contributes to the prior research by analyzing the impact of IFRS on the information content of earnings after the mandatory adoption on 2005 in the French context using their impact on the information asymmetry.

In fact, this study used two measures of information asymmetry: the capital cost and the financial analysts' forecasts. The capital cost used reflects the real level of risk perceived by investors following the IFRS adoption which represents a good measure of the relevance of published earnings. In addition, analysts' forecasts are a direct measure of the usefulness of earnings information, an important qualitative characteristic of accounting information. In this vein, Jiao, Koning, Mertens, and Roosenboom (2012) stipulate that the analyst forecasts is related to the use of reported earnings information without confounding the use of this information with subsequent trading decisions.

The choice of French context can be explained by the enormous criticisms addressed to IFRS in the French environment. The French General Accounting Plan constitutes a reference document that shows the differences between IFRS and continental accounting systems. Ding, Hope, Jeanjean, and Stolowy (2007) show that France is one of the European countries where the accounting standards are most different from IFRS and subsequently the mandatory adoption of IFRS in 2005 has led to a profound change in the Financial reporting.

Furthermore, the study of French context enables us to determine the effect of the adoption of IFRS and generalize the results to all the companies of Europe because the adoption of IFRS is mandatory for all companies listed in Europe from January 2005. So, the principal research question is: Does the mandatory IFRS adoption improve the quality of accounting numbers reflected by a reduction in information asymmetry in the French context?

The results found show a decrease in information asymmetry after IFRS mandatory adoption. This decrease is manifested by a decrease in capital cost and the improvements of the ability of analysts to forecast earnings (decrease in error and dispersion).

The remainder is organized as follows. The first part presents the background (theories and related reviews) and the hypothesis development. The second part describes the research methodology adopted and the last part is devoted to the presentation and analysis of results obtained.

2. Background and hypotheses development

European Union imposed the application of IFRS in all listed companies from January 2005 as a result of unsuccessful attempts of harmonization. This decision is argued by the improvement of the financial information quality for better decision-making.

The results found by researchers studying the impact of IFRS on the financial information quality are not similar. Several authors have confirmed the improvement of the explanatory power of the accounting numbers following the adoption of IFRS (Barth, Landsman, & Lang, 2008; Bartov, Goldberg, & Kim, 2005; Iatridis, 2010; Jermakowicz, Prather-Kinsey, & Wulf, 2007; Landsman, Maydew, & Thornock, 2012; Salameh, 2013). This result was attributed to the existence of additional information under IFRS. Escaffre and Sefsaf (2010) study the impact of additional informational relevance due to the adoption of IFRS in 2005 in several contexts. They test the relationship between stock returns and accounting numbers (earnings and equity). The results indicate that the impact of adopting IFRS on the informational relevance of accounting numbers is different from one country to another. These authors concluded that the effect of adopting IFRS on the quality of accounting numbers depends on institutional factors in each country, which is confirmed by Zogning (2013).

Ahmed, Chalmers, and Khlif (2013) conduct a meta-analysis of studies that verify the impact of adopting IFRS on informational relevance and reported revenues transparency. Their result shows that the informational relevance of equity did not increase after the adoption, while the informational relevance of earnings generally increased when they valued using pricing models. The authors

controlled factors such as legal origin, accounting system, and auditing and the difference between domestic GAAP and IFRS on the impact of IFRS and have not found any significant effect.

In addition, many studies have shown a similarity in the informational relevance of accounting data under IFRS and US GAAP (Ahmed, Neel, & Wang, 2010; Leuz, 2003; Van der Meulen, Gaeremynck, & Willekens, 2007). This result can be explained by the fact that IFRS are inspired mainly from American accounting standard. Eccher and Healy (2000) discuss the usefulness of the application of IFRS in the People's Republic of China. They concluded that the information produced under IFRS is not more useful than information prepared using Chinese standards. They attributed the IFRS failure to the lack of effective control system in China, to monitor additional information produced under international standards.

This study contributes to this literature with a different approach that attempts to verify the impact of IFRS on the informational content of earnings through their impact on the information asymmetry that originated in the agency theory dealing with the consequences of the principal–agent relationship. Jensen and Meckling (1976) define this relationship as "a contract by which one or more persons (the principal) engages another person (the agent) to perform on his behalf any task that involves a delegation of a power decision to the agent." The asymmetry of information is the fact that leaders, who are the company's directors, have more information about its financial position may pursue different interests from those of shareholders which encourage them to serve their interests against the interests of investors. Given that it is unobservable, the prior research apprehended it by three principle measures: capital cost, liquidity of shares, and financial analysts' forecasts.

According to the defendants of IFRS adoption, IFRS constitute a source of information asymmetry reduction. This reduction mitigates the risk perceived by investors, and consequently the cost of capital. According to Tweedie (2006), the elimination of a major investment risk is the concern that the different national accounting systems are not fully understood, are expected to reduce the cost of capital and open new opportunities for improvement of investment returns.

Cuijpers and Buijink (2005) and Daske (2006) find an insignificant relationship between the voluntary adoption of IFRS and the cost of equity. This result is contrary to expectations of the standard bodies, which stipulate that IFRS reduce the cost of equity. To explain this non-significant impact of the voluntary adoption of IFRS on the cost of equity, Daske, Hail, Leuz, and Verdi (2012) examine the impact of voluntary and mandatory IFRS adoption on the liquidity and the cost of capital. They make a comparison between companies applying full IFRS and those that apply a few standards only. They show no change after the voluntary adoption of IFRS. However, the mandatory adoption of full IFRS is followed by an increase in liquidity and a decrease in the cost of capital which is not the case for partial adoption. They explained the insignificant effect of the voluntary IFRS adoption and partially adoption by the non-serious application of those standards. These firms have not considered the IFRS adoption as a commitment to provide investors a higher quality of financial information.

These results have been criticized by Kim, Shi, and Zhou (2013) for two reasons. First, the differentiation between companies adopting full IFRS of partial adopters is not easy. Second, there is a general tendency to improve the quality of reports which makes it impossible to exclude the possibility that companies applying local standards, improve the quality of their reports. These authors examined the impact of the voluntary adoption of IFRS on the cost of capital and they showed a significant effect independent of the country's institutional infrastructure.

Barth et al. (2008) find that the better quality of financial statements is associated with a lower cost of capital. According to these authors, reducing the cost of equity is related to the voluntary adoption of IFRS and not related to the mandatory adoption. Li (2010) shows that the adoption of the international standard reduces the cost of equity in companies that have a strong legal enforcement. This adoption improves the comparability of information and increases the disclosure level. To

our knowledge, this is the only study that analyzed the impact of the mandatory adoption of IFRS on the cost of capital in the European Union. However, the study period ranging from 1995 to 2006, excluding the years 2004 and 2005 considered as a transition period, is insufficient to give a clear and general idea of the IFRS impact. In other words, the study period is limited to one year after the mandatory application of IFRS which may not be sufficient to properly identify the effect of the mandatory adoption of IFRS. The results may be biased by the effect of learning after the adoption of new accounting standards.

In fact, the information asymmetry may reduce after the adoption of international standards because the main objective of accounting harmonization is to improve the relevance and the comparability of information published. This reduction results in a reduction in the risk perceived by investors. According to Marston (1998), the former chairman of the Securities and Exchange Commission, "high quality accounting standards [...] reduce capital costs." In the same line of thinking, Foster (2003), a former member of the financial accounting standards board (FASB) stipulates that "More information always equates to less uncertainty, and [...] people pay more for certainty. In the context of financial information, the end result is that better disclosure results in a lower cost of capital." Furthermore, Lambert, Leuz, and Verrecchia (2007) show that higher quality accounting information and financial disclosures affect the assessed covariances with firms, and this effect unambiguously moves a firm's cost of capital closer to the risk-free rate. So, the first hypothesis states that the IFRS adoption decreases the cost of capital.

H$_1$: The IFRS mandatory adoption decreases the companies' cost of capital.

IFRS, the accounting language adopted by listed companies since 2005, gives more transparent, more rigorous, and more detailed information. Therefore, it certainly had an impact on the financial analysis of companies.

Marchal, Boukari, and Cayssials (2007) seek the effect of adopting IFRS on financial analysis and predict that these standards have made several methodological changes in the financial analysts work. They find that the adoption of IFRS weakens the comparability and makes the financial analyst work more difficult.

Ashbaugh and Pincus (2001) study the impact of differences between local standards and international standards in terms of disclosure requirements and evaluation effects on the accuracy of analysts' forecasts. The result shows that more the local standards are converged with IFRS, more the analysts' forecasts are accurate. So, they stipulate that the use of international standards informs analysts about the company's economic and financial situation better than the local standards. This study is based on a sample of firms that have adopted the international standards between 1990 and 1993 and during this period, firms could state that they adopt IFRS without applying them entirely, which may affect the relevance of the results found. To resolve this problem, Cuijpers and Buijink (2005) focus only on the year 1999, from which firms are obliged under IAS 1, to comply with all IFRS, to declare that they use these standards. They find that the voluntary adoption of these standards leads to a higher level of dispersion of financial analysts' forecasts. In contrary, Hodgdon, Tondkar Rasoul, Harless David, and Adhikari (2008) suggest that compliance with the disclosure requirements of IFRS reduces the information asymmetry and strengthens the ability of analysts to provide more accurate forecasts.

The impact of the mandatory adoption of IFRS on analysts' forecasts has been also studied by Jiao et al. (2012) in the European context. The results show that the forecasts become more accurate and less dispersed after the adoption of the new accounting standards. Jönsson, Jansson, and von Koch (2012), with a sample of five countries (Sweden, Netherlands, France, Germany, and the UK) show that the mandatory adoption of IFRS has no significant effect on the accuracy of global forecasts of financial analysts. However, by comparing the IFRS impact between countries, they show an improvement in forecast accuracy in the UK, a country with local accounting standards more similar to

IFRS, and no decrease in error forecasting in countries with previous accounting standards that differ from IFRS. They also show that, after adopting IFRS, the forecasts' dispersion seems to decrease in most countries. Tan, Wang, and Welker (2011), by studying the impact of IFRS in 25 countries, show that the quality of the forecasts of financial analysts is improved only for foreign analysts attracted by the adoption of these standards.

The heterogeneity of the previous research' results shows that the question of the impact of IFRS on financial analysts' forecasts requires more exploration. Financial analysts collect and analyze companies' financial information to form their opinions. So, the important source of information for them is the data from the financial statements (Barker & Imam, 2008). The analyst's outputs are informative to investors because their publication led to a market reaction that results in the observation of abnormal returns on the publication day or on the following day (Frankel, Kothari, & Weber, 2006). Moreover, the financial analyst is considered responsible for partial reduction in the asymmetry through his publication. Given the important role of financial analysts' forecasts in decision-making, the international accounting standards are expected to improve forecasts of financial analysts. It is predicted that the mandatory adoption of IFRS in Europe is positively associated with analysts' earnings forecast accuracy. Therefore, the second hypothesis is:

H_2: The IFRS mandatory adoption increases the financial analysts' forecasts accuracy.

Through earnings published after adoption of IFRS, companies should provide to different users of financial statements; especially the participants in the financial markets information that enable them to assess the value of the firm. According to Lang and Lundholm (1996), the adoption of IFRS will reduce the weight of private information as the result of the improvement of the quality and quantity of public information. That's why, the standards would lead to increased consensus among analysts. Therefore, it is supposed that the mandatory adoption of IFRS in Europe is negatively associated with the degree of disagreement among analysts. So, the third hypothesis is:

H_3: The IFRS mandatory adoption decreases the financial analysts' forecasts dispersion.

3. The methodological options research

3.1. Sample and data

To conduct this empirical study, the sample consists of all listed French companies in the CAC All Tradable Index. This index has replaced SBF 250 since 21 March 2011 and is the largest of the Paris Bourse. It represents the entire French economy and can indicate the overall evolution of the French equity market. According to Cormier, Ledoux, and Magnan (2010), this index reflects the diversity of the implementation of IFRS and it is the best type of samples that can draw conclusions on the application of international standards.

The examination of the impact of IFRS taking one country as sample aims to eliminate any biases associated with the use of international samples and to avoid the effect of differences in institutional environments before adopting IFRS.

Firms in financial sectors identified by Global Industry Classification Standard, such as insurance companies, credit agencies and banks, are excluded. This treatment is justified by the specific accounting and financial characteristics of these organizations that might bias the results (Bravo Urquiza, Abad Navarro, & Trombetta, 2012).

This study spreads over 11 years from 2002 to 2012, while eliminating the transition year. Several researchers consider the transition year, the first year of mandatory adoption of IFRS 2005 (Jiao et al., 2012; Jones & Finley, 2010). Others consider the year of transition the year prior to the year of the mandatory adoption of IFRS 2004 (Saadi, 2010). The third line of research has considered the two years 2004 and 2005 as transition years (Li, 2010).

According to Saadi (2010), managers are more likely to manage their results during the year preceding the year of the mandatory adoption of IFRS to avoid large fluctuations in results and to keep them within a certain range at the time of mandatory adoption. The year 2004 was a year of comparative financial statements where many companies had practiced a double set of books. Indeed, the presence of two repositories on the same financial markets during the same period may bias the results. Based on this postulate, the year 2004 considered as a transition year is excluded.

The choice of long-term study involves several interests. On the one hand, the analysis of 10 years allows us to take into account changes in standards (from PCG to IFRS) and to stand back from each accounting standards (two PCG-year and eight-year IFRS). On the other hand, this choice allows us to limit the change period of Standards bias (2004) and bias related to the period of learning and understanding of IFRS which can differentiate from one company to another (this is related to the familiarity degree of the leaders and the financial analysts to IFRS).

The observations which data are missing or extreme are eliminated. Subsequently, our final sample for the first model consists of 355 observations, for the second model consists of 617 observations and for the third model consists of 472 observations.

To collect data, the market data have been taken from the database DataStream, data from financial analysts' forecasts from I/B/E/S data and annual reports from Worldscope database.

3.2. Model and variables of research
To check the impact of IFRS adoption on information asymmetry reduction, three models are proposed.

In the first model, the information asymmetry is apprehended by the cost of capital. Then the model is the following:

$$COC = \beta_0 + \beta_1 IFRS + \beta_2 Size + \beta_3 LEV + \beta_4 \Delta R + \beta_5 Loss + \beta_6 Crisis + \varepsilon \tag{1}$$

The properties of analysts' forecasts (error and dispersion) are used as a measure of information asymmetry in the second and third models:

$$Error_{t,i}(EPS) = \beta_0 + \beta_1 IFRS_t + \beta_2 \ln MktCap_{t-1,i} + \beta_3 \ln N_{t-1,i} + \beta_4 \Delta EPS_{t-1,i}$$
$$+ \beta_5 Decline_{t-1,i} + \beta_6 Loss_{t-1,i} + \beta_7 SDeps_{t-1,i} + \beta_8 FP_{t-1,i} + \beta_9 CS_{t,i} + \varepsilon \tag{2}$$

$$Dispersion_{t,i}(EPS) = \beta_0 + \beta_1 IFRS_t + \beta_2 \ln MktCap_{t-1,i} + \beta_3 \ln N_{t-1,i} + \beta_4 \Delta EPS_{t-1,i}$$
$$+ \beta_5 Decline_{t-1,i} + \beta_6 Loss_{t-1,i} + \beta_7 SDeps_{t-1,i} + \beta_8 FP_{t-1,i} + \beta_9 CS_{t,i} + \varepsilon \tag{3}$$

Table 1 summarizes the variables of the models:

According to Bravo Urquiza et al. (2012), the measure of the capital cost is problematic in this current literature. Thus, to calculate this cost, the formula of Easton (2004), which is widely adopted by previous studies Li (2010), Bravo Urquiza et al. (2012) and Kim et al. (2013), was used. These later authors state that the measure proposed by Easton (2004) is a robust assessment of specific cost of

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Table 1. Definitions and measures of variables	
Variables	**Definitions and measures**
COC	Capital cost of the company in year t
Error	Analyst forecasts' error for year t
Dispersion	Analyst forecasts' dispersion for year t
IFRS	IFRS is a dummy variable, which equals to 1 for years after 2005 and 0 otherwise
Size	Firm size is measured by the natural logarithm of the total market capitalization at the end of t-1
LEV	Firm leverage measured by the ratio (net debt/EBITDA) to t-1
ΔR	Variation in the annual return of the company calculated by the annual standard deviation of monthly stock returns at the end of year t-1
Ln N	Natural logarithm of the number of estimates in the final consensus forecast for year t
Δ EPS	Absolute value of the change in EPS of firm i between t-1 and t
Decline	Decline takes the value 1 if the result of year t is less than that of the year t-1, 0 otherwise
Loss	Loss takes the value 1 if the result for the year t is negative, 0 otherwise
SDeps	Standard deviation of the actual EPS of firm i over the four years preceding the year t standardized to the stock price of the same firm in the same year
FP	Firm performance volatility measured by the standard deviation of ROE based on the five years before year t
CS	CS is a dummy variable, which takes 1 for the years 2008, 2009, and 2010 and 0 otherwise

Note: Presents and defines the different variables used in this study.

capital. This measure is based on the assumption of zero growth of abnormal profits. It is based on earnings per share forecasts for two years in advance and the current price combined as follows:

$$COC = \sqrt{\frac{(eps2 - eps1)}{P0}}$$

where eps 2 and eps 1 refer to earnings per share forecast of 2 and 1 year in advance, P_0 is the current price, and the COC is used to proxy the cost of capital.

To apply this formula, it is compulsory that the earnings forecast of the second year of a given firm are higher than earnings forecast of this company in the first year later.

The forecasting error is the difference between the expected profit and profit released. So it is expressed:

$$E(EPS)_t = EPS_{it} - \pi (EPS)_{it}$$

With EPS_{it} = The earnings per share of firm i on year t and $\pi (EPS_{it})$ = The average forecast of EPS for firm i in year t

The dispersion is determined by the absolute value of the difference between the highest forecasting and the lowest forecasting.

$$D(EPS)_t = |forecast_{h,i,t} - forecast_{l,i,t}|$$

To make comparability across firms, dispersion and error are normalized by the stock price of the company at t-1.

To calculate these variables, earnings forecasts submitted in 180 days starting 15 days after the beginning of the year are used. The choice of this period is derived from the study's aim which is an assessment of the informational content of earnings published by forecast EPS of year t. This procedure ensures that when the analyst makes his prediction, he takes into account the accounting information published.

The variable of interest is the IFRS that indicates the change in accounting standards following the IFRS mandatory adoption in Europe dice 2005.

The effect of IFRS adoption on information asymmetry may be affected by several control variables.

The size of the company for example has been introduced by several researchers to explain the cost of capital (Botosan, 1997; Easton, 2004; Francis, Nanda, & Olsson, 2008; Gebhardt, Lee, & Swaminathan, 2001; Kothari, Li, & Short, 2009). This variable is negatively related to the cost of capital and to the error and dispersion of financial analysts' forecasts (Jiao et al., 2012; Lang & Lundholm, 1993). However, large firms are considered more transparent. They disclose more information about their financial situations than small firms because disclosure policy gives them many benefits in net terms (Lang & Lundholm, 1993; Welker, 2005) and because they may have access to more information more easily than small (Barron, Byard, & Kim, 2002). Therefore, the level of information asymmetry will decrease for large companies. The negative relationship between firm size and cost of capital is explained also by the fact that the risk of insolvency of large companies is less than the smaller companies which confirms the reduction in the cost of capital for large companies (Bravo Urquiza et al., 2012). Consequently, large companies are expected to have a high level of disclosure which leads to less cost of capital, greater precision, and less dispersion in financial analysts' forecasts. Similar to prior studies (Ashbaugh & Pincus, 2001; Jiao et al., 2012), the firm size is defined as the natural log of a firm's market capitalization at the end of year t-1.

According to Hail and Leuz (2006), it is commonly accepted that leverage has an effect on the cost of capital. Moreover, many researchers find that this leverage measured by the ability of the company to repay its debts, affects positively the cost of capital (Easton, 2004; Francis et al., 2008; Gebhardt et al., 2001; Li, 2010). Indeed, firms with high leverage have more risk of insolvency which increases their cost of capital.

Variation in returns is positively associated with the cost of capital. In other words, the more volatile the stock returns the higher the risk perceived by investors . This reduces the level of confidence of the latter and thus increases the capital cost (Fama & French, 1992; Hail & Leuz, 2006; Li, 2010).

The number of analysts is another variable that may have an impact on the forecasts quality (Byard, Li, & Yu, 2011; Jiao et al., 2012; Lang & Lundholm, 1996; Lys & Soo, 1995). It is determined by the number of analysts following the company and providing earnings forecast (Lang & Lundholm, 1996). This variable is positively associated with forecast accuracy and negatively associated with the dispersion of financial analysts' forecasts. Lys and Soo (1995) argue that there is more competition among analysts when the number of analysts increases. These will be more incentive to forecast accurately. So, the firms followed by a high number of financial analysts will have more accurate forecasts and a higher level of forecasts' dispersion.

It is widely discussed in the literature that the change in the firm's result has an effect on financial analysts' forecasts (Lang & Lundholm, 1996; Marston, 1997). So, forecasts of firm's earnings with more variable results are less accurate and more dispersed. Furthermore, Hope (2003) shows that the results variability makes the forecasting more problematic. So, more the change in the result of two successive years , the more difficult the forecasting profits.

Because financial analysts are subject to conflicting interests and firms in difficulty tend to disclose little information to conceal its difficulties, analysts anticipate imperfectly losses (Maghraoui & Dumontier, 2008). Forecast error and dispersion tend to be higher when the announced EPS is negative or significantly decreased. Financial distress is approached through Decline and Loss.

Decline is a binary variable which designed whether the result of the year t has been increased or decreased compared to result of the year t-1. In addition, Loss is a binary variable which designed whether the result of the year t is negative. These two variables are expected to be positively associated with the error and forecast dispersion. Yet, only the loss is expected to increase the cost of capital. In fact, financial analysts are optimistic agents that tend to underestimate profit falls and losses. Indeed, Coën and Desfleurs (2010) confirm that it is easier for analysts to forecast profits as losses and increases profits rather than decreases. The results of these authors suggest that the "type and variation of profit expected" is by far the effect that best explains the accuracy and dispersion of forecasts.

SDeps represents the standard deviation of EPS for firm i calculated over the four years preceding the year relative to estimated EPS (Maghraoui & Dumontier, 2008). It is standardized by the stock price of the company concerned in t and it aims to assess the difficulty of forecasting. The dispersion and the error increase with the increasing of this value (Lang & Lundholm, 1996). In fact, more fluctuating the benefits of the firm, less easier the forecasting profits.

The financial performance of the company, as measured by the standard deviation of ROE based on the five years before year t, is positively associated with forecast error and forecast dispersion (Jiao et al., 2012). According to these authors, it is difficult to have accurate forecasts and less dispersed forecasts where the financial performance varies widely.

The last control variable is the financial crisis which has begun in 2007. This crisis, in the beginning banking and located in the American mortgage market, quickly became global and financial. It has led to difficulties in investment and to a heightened uncertainty in financial markets because investors are more risk averse when selecting projects and markets. So, it creates severe problems of asymmetric information, makes the collection of the necessary information more difficult which increases the difficulty of the work of the financial analysts. That's why, it is expected that crisis is positively associated with the cost of capital, the error, and the dispersion of analysts' forecasts. The effects of this crisis persist until now but the main effects can be limited to the three years 2008, 2009, and 2010.

The impact of IFRS on cost of capital and financial analysts' forecasts is tested using a panel data model and the regression is performed using STATA.

4. Empirical tests and results

4.1. Descriptive statistics
Descriptive Statistics of numeric and dichotomous variables are presented, respectively, in Table 2 and Table 3. To test the dispersion of financial analysts' forecasts, the firm must be necessarily followed by at least two analysts. Consequently, the observation characterized by a single financial analyst is eliminated.

Table 2. Descriptive statistics of numeric variables				
Variables	**Mean**	**Std. dev.**	**Min**	**Max**
Panel A: Cost of capital				
COC	0.439	0.519	0	3.640
Log MC	3.345	0.730	1.768	5.133
LEV	2.715	7.705	0.003	96.4
ΔR	441.761	1,122.253	0.148	13,057.67
Panel B: Error of financial analysts' forecasts				
Error	−0.440	1.339	−19.881	3.197
Log MC	3.524	0.710	1.899	5.122
Log *N*	0.435	0.302	0	1.204
Δ EPS	0.030	0.048	0	0.462
SDeps	0.046	0.070	0	1.019
PF	3.513	8.360	0.010	94.683
Panel C: Dispersion of financial analysts' forecasts				
Dispersion	0.575	0.835	0.161	8.396
Log MC	3.669	0.683	1.982	5.122
Log *N**	0.565	0.216	0.301	1.204
Δ EPS	0.030	0.050	0	0.462
SDeps	0.045	0.061	0	0.880
PF	3.764	9.386	0.010	94.683

Notes: *N**: The number of analyst forecast for the dispersion model.

The descriptive statistics of numeric variables used respectively in the capital cost, error and dispersion models.

Table 4 presents the simple correlations between the different variables of the first, the second, and the third model. The dependent variable COC is positively and significantly correlated with variables loss and financial crisis at 1%. This can be explained by the uncertainty resulting from the financial crisis and the high level of risk that is generated.

Error is negatively associated with IFRS, positively associated with size, negatively associated with analyst coverage (Jiao et al., 2012), and positively associated with crisis. Furthermore, dispersion is negatively associated with IFRS and size and positively associated with analyst coverage, variation in EPS, decline, loss, standard deviation of EPS, financial Performance, and crisis.

For the three models, the examination of the correlation matrix shows that all correlation coefficients are lower than 0.9 which indicate that there aren't serious problems of multicollinearity. Furthermore, all variables used, have a value of VIF "Variance Inflation Factor" less than 10, limit suggested by Gujarati (1995) and Kennedy (1998). These results allow concluding that there is no serious problem of multicollinearity.

Table 3. Descriptive statistics of dichotomous variables			
Variables	**Modalities**	**Frequency**	**%**
Panel A: Cost of capital			
IFRS	1	288	81.13
	0	67	18.87
Loss	1	46	12.96
	0	309	87.04
CS	1	106	29.86
	0	249	70.14
Panel B: Error of financial analysts' forecasts			
IFRS	1	476	77.15
	0	141	22.85
Decline	1	221	35.82
	0	396	64.18
Loss	1	69	11.18
	0	548	88.82
CS	1	162	26.26
	0	455	73.74
Panel C: Dispersion of financial analysts' forecasts			
IFRS	1	336	71.19
	0	136	28.81
Decline	1	169	35.81
	0	303	64.19
Loss	1	48	10.17
	0	424	89.83
CS	1	111	23.52
	0	361	76.48

Note: The descriptive statistics of dichotomous variables used, respectively, in capital cost, error and dispersion models.

4.2. The empirical results

The comparison of dependent variables (COC error and dispersion) in both periods pre-IFRS and post-IFRS, was done by the non-parametric Mann–Whitney test. This test was adopted following the significant results of the normality test. The results of M W test reveal significant differences in the three dependent variables based on the mandatory adoption of IFRS in 2005 (Table 5).

Given that this study is based on a sample of panel data, it is necessary to verify the specification of a homogeneous or heterogeneous data. The Hausman specification test is used to discriminate between fixed and random effects.

The results found from Hausman test (Table 6) lead us to retain the fixed-effect model to estimate models and the Fisher statistic of the three models confirms their good quality at a significance level of less than 1%. So, models are statistically significant and explain the phenomenon.

Table 6 presents the regressions results. For the value of *Z*, it is not always equivalent to the exact value of the ratio between the coefficient and standard deviation that taking into account only the first three digits after the decimal point.

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Table 4. Correlation matrix

	COC	IFRS	Log MC	LEV	ΔR	Loss	CS	VIF
Panel A: Cost of capital								
COC	1.000							
IFRS	−0.062	1.000						1.19
Log MC	0.083	0.055	1.000					1.12
LEV	−0.039	0.055	0.017	1.000				1.10
ΔR	0.086	0.139	0.541***	−0.001	1.000			1.10
Loss	0.137***	−0.221***	0.009	0.111**	−0.090*	1.000		1.09
CS	0.304***	0.314***	0.065	0.000	0.142***	−0.031	1.000	1.04

Panel B: Error of financial analysts' forecasts

	Error	IFRS	Ln MC	Ln N	Δ EPS	Decline	Loss	SDeps	FP	CS	VIF
Error	1.0000										
IFRS	−0.296***	1.0000									1.74
Ln MC	0.278***	0.090**	1.0000								1.50
Ln N	−0.113***	−0.380***	0.469***	1.0000							1.46
Δ EPS	0.080	−0.041	−0.029	−0.040	1.0000						1.19
Decline	−0.002	−0.030	−0.018	−0.005	0.149***	1.0000					1.19
Loss	0.016	−0.150***	−0.030	−0.090**	0.173***	0.104***	1.0000				1.17
SDeps	−0.017	0.035	−0.012	−0.061	0.359***	0.194***	0.210***	1.0000			1.15
FP	−0.0082**	−0.023	0.029	−0.059	0.251***	0.081**	0.187***	0.271***	1.0000		1.06
CS	0.236***	0.326***	0.087**	−0.151***	0.030	0.102**	−0.008	0.076*	0.002	1.0000	1.05

Panel C: Dispersion of financial analysts' forecasts

	Dispersion	IFRS	Ln MC	Ln N*	Δ EPS	Decline	Loss	SDeps	FP	CS	VIF
Dispersion	1.0000										
IFRS	−0.330***	1.0000									1.52
Ln MC	−0.239***	0.190***	1.0000								1.48
Ln N*	0.226***	−0.346***	0.343***	1.0000							1.40
Δ EPS	0.209***	−0.028	0.011	−0.015	1.0000						1.27
Decline	0.138***	−0.017	−0.035	0.019	0.157***	1.0000					1.21
Loss	0.145***	−0.154***	−0.007	−0.085*	0.124***	0.038	1.0000				1.18
SDeps	0.301***	0.042	−0.019	−0.050	0.392***	0.200***	0.201***	1.0000			1.16
FP	0.231***	−0.011	0.058	−0.080*	0.271***	0.103**	0.174***	0.280***	1.0000		1.08
CS	0.089*	0.353***	0.154***	−0.165***	0.049	0.149***	−0.065	0.088*	0.010	1.0000	1.06

Note: The correlation matrix of the capital cost, error, and dispersion.

*Significant at 10%.

**Significant at 5%.

***Significant at 1%.

Table 5. Results of the comparison test

	Skewness/Kurtosis test of normality	Non-parametric Mann–Whitney test	
	Prob. > χ^2	Z	Prob. > Z
COC	0.000	1.167	0.0243
Error	0.000	−7.320	0.000
Dispersion	0.000	7.129	0.000

Note: The results of comparison test.

Table 6. Regression results				
Variables	**Coef.**	**Std. err.**	**Z**	**P > |Z|**
Panel A: Cost of capital				
IFRS	−0.163	0.066	−2.45	0.015**
Log MC	−0.321	0.118	−2.72	0.007***
LEV	−0.004	0.003	−1.42	0.158
ΔR	0.000	0.00003	0.39	0.697
Loss	0.148	0.087	1.70	0.091*
Crisis	0.333	0.054	6.10	0.000***
Constant	1.536	0.397	3.87	0.000***
R^2 = 16%				
χ^2 = 12.49, Prob. > χ^2 = 0.051				
F = 8.44, Prob. > F = 0.0000				
Panel B: Error of financial analysts' forecasts				
IFRS	−0.305	0.138	−2.21	0.027**
Ln MC	2.050	0.255	8.02	0.000***
Ln N	−0.551	0.227	−2.43	0.015**
Δ EPS	1.534	1.123	1.37	0.173
Decline	0.003	0.101	0.03	0.974
Loss	0.121	0.181	0.67	0.501
SDeps	3.073	0.823	3.73	0.000***
	−0.001	0.007	−0.16	0.870
CS	0.132	0.112	1.17	0.243
Cons	−7.426	0.902	−8.23	0.000***
R^2 = 0.1387				
χ^2 = 66.28, Prob. > χ^2 = 0.000				
F = 9.39, Prob. > F = 0.0000				
Panel C: Dispersion of financial analysts' forecasts				
IFRS	−0.162	0.074	−2.18	0.030**
Ln MC	−1.467	0.144	−10.18	0.000***
Ln N*	0.691	0.166	4.16	0.000***
Δ EPS	0.577	0.621	0.93	0.353
Decline	0.027	0.057	0.48	0.628
Loss	0.190	0.111	1.71	0.089*
SDeps	−1.211	0.540	−2.24	0.026**
FP	0.088	0.004	2.08	0.039**
CS	0.057	0.067	0.86	0.391
Cons	5.654	0.536	10.55	0.000***
R^2 = 0.2996				
χ^2 = 35.24, Prob. > χ^2 = 0.000				
F = 18.16, Prob. > F = 0.0000				

Note: The regression results of the IFRS mandatory adoption impact on the companies' capital cost, error, and dispersion of financial analysts' forecasts.

*Significant at the 10%.

**Significant at the 5%.

***Significant at the 1%.

4.2.1. IFRS and cost of capital

Statistical tests highlight the negative impact of adopting IFRS on the cost of capital. Indeed, the examination of causal relationships shows that the coefficient associated with the link between the adoption of IFRS and the capital cost is negative (−0163) and statistically significant (*P* value > is 0.015). These results show that the mandatory adoption of IFRS in 2005 leads to a significant reduction in the cost of capital.

The capital cost was used in this study as a measure of the level of information asymmetry of a given company. However, the reduction in this cost reflects a reduction in information asymmetry. This result highlights the informational contribution of the adoption of this new international standard which permits to conclude that the IFRS mandatory adoption improves the information content of accounting earnings.

In addition, and in line with our expectations and the previous results (Li, 2010; Paugam, Ramond, Husson, Philippe, & Casta, 2013), there is a negative association between firm size and the capital cost. This association can be explained by the fact that large companies are encouraged to disclose more information to the public than the smaller ones. Moreover, large companies are considered more transparent and this transparency represents a source of information asymmetry reduction and therefore of cost of capital reduction.

Loss and financial crisis are control variables that also have a significant effect on the cost of capital. The positive association between these two explanatory variables and the cost of capital is related to their effects on the level of investor confidence to the company. In other words, the investor has less confidence in loss making company and more uncertainty to any investment in times of crisis.

Several authors state that the significant impact of the crisis on the financial situation of listed companies is largely related to the adoption of international standards and particularly the fair value principle applied within these standards. Obert (2008) provides that IFRS are not responsible for the financial crisis, but they have undoubtedly exacerbated it following the use of fair value as the measurement basis. This was invalidated by the IFRS defendants as Danjou and Gelard (2008), who stipulate that these standards have helped to anticipate the behavior in investors and eliminate sudden volatilities in crisis. In fact, the application of IFRS considered as a factor accentuating the financial crisis remains a subject of ongoing debate between the defendants and the opponents of IFRS.

4.2.2. IFRS and analyst proprieties

The analysis of the IFRS mandatory adoption on the financial analysts' forecasts shows that IFRS adoption is negatively associated with the properties of analysts' forecasts namely error and dispersion. Indeed, an examination of causal relations shows that the coefficient associated with the link between the adoption of IFRS and the error of analysts' forecasts is negative (−0,305) and statistically significant (*P* value > is 0.027). In addition, the results show that the coefficient associated with the link between the adoption of IFRS and the dispersion of analysts' forecasts is negative (−0,162) and statistically significant (0.30). These results show that the IFRS mandatory adoption produces an improvement in the quality of financial analysts' forecasts. Indeed, the forecasts are more accurate and less dispersed after the adoption of IFRS.

The financial analysts' forecasts were used in this study as a measure of information asymmetry level of a given company. However, the reduction in error and forecast dispersion reflects a reduction in information asymmetry. This result confirms the previous findings at cost capital level and highlights the informational contribution of the adoption of this new international standard which allows concluding that the mandatory adoption of IFRS represents a source of improving the information content of accounting earnings.

The forecast error is significantly and positively associated with firm size, the standard deviation of EPS, and negatively associated with the number of financial analysts. In addition, the forecast dispersion is significantly and positively associated with the number of financial analysts who follow the company, the loss, and the financial performance and negatively associated with the size of the company and the standard deviation of EPS.

The positive association found between the error and the size of the company is opposite to the result found by Jiao et al. (2012) and to our expectations and similar to the results of Maghraoui and Dumontier (2008). According to these latter authors, this result can be explained by the complex assets and activities of large companies. On the contrary, the size is negatively associated with the forecast dispersion which can be explained by the higher possibility of large companies to access further information.

The standard deviation of EPS is a measure of the results instability which represents a source of forecast difficulties. So, the increase in instability generates a higher level of error and a low forecast accuracy. The negative effect of this variable on forecast dispersion may be explained by the analysis period. In fact, in times of crisis, financial markets are characterized by a high instability which led analysts to reconcile their forecasts to previous results.

In accordance with previous findings (Jiao et al., 2012; Lys & Soo, 1995), forecast error is negatively correlated with analyst coverage which is explained by the competition among the analysts. When the number of analysts following the company is higher, each analyst aims to forecast more accurately than the others and consequently the forecast error decreases and the forecast dispersion increases.

It is confirmed by the results obtained that the losses and the variation in the financial performance increase the forecast dispersion.

The non-significant effect of the crisis on error and dispersion of financial analysts' forecasts can be explained by the analyst's reaction to this critical period. Faced with the risk of committing significant forecast errors, the analysts are forced to intensify their research. According to Levasseur and Romon (2011), financial analysts, in times of crisis, most follow market movements to eliminate any estimated errors.

5. Conclusion

Our study focuses on a major objective of the mandatory adoption of IFRS in Europe since 2005, which is the improving of the relevance of earnings. To answer the research question, this study tried to determine the impact of these standards on the information content reflected by their impact on information asymmetry. For this purpose, the cost of capital and the financial analysts' forecasts were used as proxies of information asymmetry. The sample comprised all of the CAC all tradable for the period 2002–2012.

The results show that the information content of earnings is improved after the IFRS mandatory adoption and this improvement is reflected by a reduction in capital cost and error and dispersion of financial analysts' forecasts.

The originality of this study consists first in analyzing the impact of mandatory IFRS on the information content of earnings using the two measures of information asymmetry, cost of capital and analysts' forecast properties and second in taking a long analysis period from 2002 to 2012 as a period of study. This eliminates all bias related to the learning of these standards and to crisis.

The results provide evidence relevant to the continued debate about the benefits of international accounting harmonization. So, even if the adoption of IFRS is mandatory diced 2005 for all listed European companies, the impact of these standards may be dependent on the specific institutional factors in each country. This study can be enriched by the inclusion of several European countries to clearly identify the impact of institutional environments.

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