Mandatory IFRS adoption, investor protection and earnings management: A data analysis of Germany, France and Belgium listed companies

1. Introduction

This paper investigates the impact of investor protection on earnings management before and after mandatory adoption of International Financial Reporting Standard (IFRS) based on panel analysis in France, Germany and Belgium context. IFRS was developed by the International Accounting Standard Board (IASB) with the aim to establish a common accounting language across the world (Ball, 2006). Globalization of financial markets has provided strong motives for the IFRS adoption. The principal determinant for adopting IFRS is the quest for economic efficiency and effectiveness (Guerreiro, *et al.,* 2012). IASB seeks to release more relevant accounting information that underwrites the making economic decisions (Houqe *et al.*, 2012). Hilliard (2013) suggests that investor protection is one of the major concerns of IFRS. Shleifer and Vishny (1997) and La Porta *et al.*, (2000) focused that investor protection is an institutional determinant of corporate choices and policy. Similarly, prior researches provide that strong investor protection is a potential factor that determines the disclosure of high quality accounting information (La Porta *et al.,* 1998; Ball, *et al.*, 2000; La Porta *et al.*, 2000; Leuz, *et al.,* 2003; La Porta *et al.*, 2006; Houqe *et al.,* 2012). Leuz *et al.,* (2003) stressed that investor protection has a significant effect on earnings management.

In this paper, we associate the investor protection with mandatory IFRS adoption and their effect on earnings management from the perspective of agency theory. Jensen and Meckling (1976) reveal that this theory aims to mitigate the conflict of interest between manager and investor. Manager tries to adopt opportunistic behaviors that maximize his personal interest based on accounting choice offered by reporting standards. However, this behavior affects the investor interest by limiting his decision-making power. Barth *et al.,* (2008) show that the inherent flexibility in principles based standards could grant greater opportunity for managers to manage earnings. Iatridis (2012) reveals that IFRS adoption aims to enhance accounting quality, mitigate informational asymmetry and reduces agency costs. In this sense, Grecco *et al.,* (2014) focused that after transition to IFRS enforcement of investor protection reduces earnings management. This assumption makes the communication between the principal and the agent more confidents and accounting information becomes more relevant.

In our study, we use a panel data from two countries namely France, Germany and Belgium as these countries are characterized as civil law legal origins. We test our hypotheses on a sample of 1166 firm-year observations from 2000 to 2011, except 2005 (the transition year). In the pre-IFRS period, sample composed by firms that voluntary adopt IFRS and those which keep their domestic standards (DS). In the post-IFRS period, all firms have mandatory adopt IFRS.

Our article contributes to the literature in several ways. First, the study has been concerned with comparative analysis in three levels. In the first level, we make the analysis in the pre-adoption period (from 2000 to 2004) between voluntary IFRS adoption and domestic standards. In the second level, we do the comparison between mandatory IFRS adoption and voluntary IFRS adoption in the post-adoption period (from 2006 to 2011). In the third level, we perform the analysis into both reporting periods. Second, our sample includes three different countries from Franco-Germanic law origin. Finally, in order to measure investor protection we develop a score composed of four macroeconomics factors collected from annuals reports of World Economic Forum (WEF). The score consists of calculating the weighted averages of each index for each company (i) of each country (j) at time (t), then, we made the sum of all indexes and finally we divided the sum by the number of indexes.

Therefore, the main objective of this paper is to examine the effect of investor protection on earnings management before and after transition to IFRS. To achieve this goal, we conducted a comparative study between pre-IFRS and post-IFRS periods.

The remainder of the paper is organized as follows. In section 2 we develop the theoretical background. Section 3 describes prior empirical literature and hypotheses development. Section 4 explains the research design and section 5 presents the results and discussion. Section 6 offers conclusions and summary.

2. Theoretical background

2.1. Investor protection determinants

Investor protection is conditioned by legal factors and economic factors.

2.1.1. Legal determinants of investor protection

The degree of investor protection depends of the country's legal system. In fact, the literature highlights the existence of two systems; *civil law* and *common law* (La Porta *et al.*, 1998). The civil law is based on the codification (Houqe *et al.,* 2014). Laws obey a set of rules and regulation. However, common law is based on the judicial decisions determined by

jurisprudence (Daske *et al.,* 2008). In addition, the laws are established following a decentralized and controlled fashion by several interest groups. Under common law, institutions and private organizations can ensure the production of rules and principles. Indeed, the IASB takes its legitimacy from this opportunity offered by the common law (Collin *et al.,* 2009). It succeeded to adapt to the requirements of financial markets through the developments of the IFRS standards. In fact, these standards have been accepted socially and publicly by EU countries. This Accounting event has validated the effectiveness of common law, especially since those who have imposed the adoption of IFRS standards are a code law countries. Strict, rigid and restrictive civil law character has become an obstacle to adaptation to the market fluctuations and environmental changes, indeed, the interests of investors will be threatened. However, common law offers to investors a legal protection better than that offered by the code law (La Porta *et al.,* 2008).

La Porta *et al.,* (1997) suggest that institutional factors affect the legal investor protection. In this sense, La Porta *et al.,* (2000) assumed that the distribution of dividends requires an efficient market and effective legal investors' protection. Thus, they have indicated that good legal protection mitigate the discretionary behaviours of managers. As a result, the confidence of minority shareholders in legal system offers them the opportunity to accept low dividends. However this opportunity is not the same in the code law countries. Investors are at the centre of economic sphere, so their protection is of first necessity. However, all party involved in the movement of capital and strengthen its financial systems are concerned more effectively to ensure a high level of investors' protection.

2.1.2. Accountant and financial determinants of investor protection

Accounting aims to provide relevant accounting information that supports investors' decision-making (Houqe *et al.*, 2012 and Houqe *et al.*, 2014). This matter has been explained in terms that are the beginning of a new era in the history of financial systems that converged accounting and finance. In fact, professional and accountants agreed for the need to protect the investors for the continuity of financial markets (Defond and Hung, 2004). The thread of this connection is the fair value. This principle is the valuation model of some elements of assets and liabilities of firms. Similarly, the value relevance of accounting information is measured by the Ohlson model (1995). This model is based on the ability of the accounting values to explain the company's market value. We can conclude from this model that accounting information can be relevant if it explains the market value of the company.

Market value is associated with expectations of investors, and therefore the decision-making usefulness of the latter is associated with the informational content of the financial statements of the company. This reasoning implies that the value relevance of accounting information is an important determinant of investors' protection. In this sense, the relevance must characterize the accounting information to facilitate decision-making by investors for confirmation or correction of its forecast earlier. However, information from the traditional accounting model suffers from lack of the relevance and does not adopt the point of view of the investors. As a result, international standards have introduced the principle of fair value which favours the interests of the investors in the dissemination of information (Hilliard, 2013). This principle sets a financial dimension to accounting information. This dimension is manifested when the determination of fair value, on an active market, is based on stock prices, or its determination on the basis of discounting of future cash flows in the case of inactive market. This assumption implies that this principle offers to investors a relatively strong protection against the contingencies of financial markets.

2.2. The motivations of earnings management

Earnings management is rooted in the accounting literature. It has been the subject of many current theoretical research and practice. Several studies considered earnings management as a measure of the accounting quality (Barth *et al.,* 2008; Tsalavoutas, André and Evans, 2012; Iatridis and Dimitras, 2013; Palea and Maino, 2013). In this paper, we will study the effect of the investors' protection on the earnings management in the context of the transition to IFRS. The motivations of earnings management can be influenced by several factors such as the requirements of shareholders (a contractual dimension), the political cost monitoring and the interests of other stakeholders.

2.2.1. Shareholders' Interests

Jensen and Meckling, (1976) noted that the existence of conflicts of interest between CEO and shareholders generated by the information asymmetry. Managers are considered to be opportunistic. Indeed, they can use their informational power to maximize their self-interest at the expense of the interest of the shareholders. To prove his good *"faith"*, managers attempted to produce accounting information allowing the reduction of agency costs. In fact, the check of this information by the shareholders their offers the advantage to know if funds set to the company have been assigned in accordance with their interests (Schatt and Breton, 2003).

Earnings management is designed within the contractual dimension to change the impression of the shareholders in the resources management (Stolowy and Breton, 2003). Managers should make adjustments and adopt accounting choices that affect the earnings. Thus, the later are encouraged by the opportunities provided by the flexibility of the rules and accounting standards (Dechow and Skinner, 2000).

2.2.2. Political cost monitoring

Political cost monitoring consists of the costs resulting from the regulations, laws and Government legislation. Positive accounting theory developed by Watts and Zimmermann (1978) has implemented the assumption of political visibility. Indeed, this theory proposes the hypothesis that companies, whose political visibility is important, manage downward their earnings (Watts and Zimmermann, 1978). However, the State is tempted to interfere, since a high profit is considered to be a signal that informs about the weak conditions of the competition in the business sector. For environmental and ecological reasons companies manage earnings downward, with the aim to reduce the costs of new laws and environmental regulations (Labelle and Thibault, 1998). These motivations tend to reduce the contribution of the shareholders in the wealth of the nation. Shareholders are seeking to maximize their economic well-being while abandoning the general interest. Another motivation is necessary, is the reduction in financing costs. In this sense, managers can manipulate accounts before the IPO or the operation of the capital increase (Broye and Schatt, 2002). In fact, the choice of income smoothing is encouraged by these motivations. When managers adopt this choice, the cost of capital will be reduced (Stolowy and Breton, 2003).

2.2.3. Interests of other stakeholders

About the relationship between CEO and other stakeholders, research showed that earnings management is mainly justified by the will of the managers to absorb the effect of the restrictive nature of loans contracts. Defond and Jiambalvo (1994) and Sweeny (1994) have shown that companies that reach the limits required by the loans contracts choose the accounting modalities that increase results. Several studies have validated this hypothesis. Indeed, Dechow and Skinner (2000) and Fung *et al.,* (2013) confirm that the most indebted companies adopt accounting methods that increase the earnings. Membership of the company in an economic environment determines the way of earnings management. In situation where the shareholder is a member of the Board of Directors, the asymmetry of information is

insignificant. Therefore, the fundamental concern of managers either to affect the perceptions of other stakeholders to maximize the shareholders' value creation.

This particular situation, where the manager is himself a shareholder, is a manifestation of the orientation towards managing the relationship between the manager and other stakeholders of the company. Regarding this inspirations, the contractual relationship corresponds to the difference between the opportunity costs of other stakeholders and explicit price negotiated between them and the shareholder.

3. Literature review and hypothesis development

The transition to IFRS approved by the exigencies of the globalization of financial markets. Therefore, European listed companies took the initiative to be the first that have mandatory adopt the IFRS. Furthermore, this passage announces a paradigm shift and is the source of many waves. We will try to study the effect of investors' protection on the earnings management under the transition to international accounting standards. This debate has been the subject of several academic and practical research (Shleifer and Wolfenzon, 2002; Leuz *et al*., 2003; Defond and Hung, 2004; Barth *et al.,* 2005; Barth *et al.*, 2008; Barth *et al.,* 2012; Houqe et *al.*, 2012; Jeanjean, 2012; Yu *et al.,* 2013; Houqe *et al.*, 2014; Liu *et al.,* 2014; *Dayanandan et al.,* 2016; Noh *et al.,* 2017).

Ball *et al.* (2000) demonstrate that the IFRS standards can disclose a high quality of accounting information within a legal, efficient and independent system able to detect and punish fraud and to establish a solid foundation to protect the investor. Similarly, Biddle and Hilary (2006) added that the value relevance of accounting information may reduce the sensitivity of investment cash flows to the fluctuations in the market, in an environment where investors are well protected. Liu *et al.,* (2014) use a sample of companies listed in the Germany Frankfurt Stock Exchange to examine the earnings management of companies using US GAAP and IFRS. Results show that earnings management through RD investments is significantly lower for US GAAP firms than IAS/IFRS firms. Authors explain this finding by the way that Germany has a strong legal system that lead to protect lenders and equity investors). In the context of Chinese Market, Liu et *al.,* (2011) argue that the switch to international standards in China increases the value relevance of earnings and significantly decreases earnings management. Noh *et al.,* (2017) studied the use of shifting classification to smooth earnings in Korean market and reveal that at the transition year, firms manage earnings by shifting other revenues and expenses to improve their operating performance. Gonzalez *et al.,* (2014) examine the effect of IFRS adoption on the accounting information

(financial statements) of Spanish listed companies. The findings reveal that in the post IFRS period, all items of balance sheet and income statements analysed was significantly changed. This matter stipulates that the transition to IFRS has a high influence on Spanish listed firms. Chen and Rezaee (2012) use a sample of Chinese listed company and find that the better instrument to facilitate the convergence between Chinese standards and International standards is to concentrate on the relevance of corporate governance mechanisms by investors and standard setters. Liu (2011) investigates the comparability between the reported net incomes prepared in accordance with US GAAP and IFRS. Author use a sample of US-listed Chinese firms and finds that the major reason of the difference between both GAAP is the adjustments of tangibles assets re-evaluation and the level of investor protection between both standards setters. Liu and O'Farell (2011) find that the compulsory adoption of substantially IFRS-convergent standard increases the accounting quality and decreases the earnings management in Chinese companies.

Leuz *et al.* (2003) investigated the effect of investor protection on the earnings management for a sample of 31 countries. Results showed that a strong investors' protection can reduce earnings management and allows obtaining high quality of accounting information. Bhattacharaya *et al.,* (2003) and Bushman *et al.,* (2004) revealed that countries which have a strong investor protection system may produce accounting and financial information transparent, sincere and reflects the true and fair view financial situation of the company. *Dayanandan et al.,* (2016) use a sample of different countries around the world from different legal systems to analyse the accounting quality under IFRS. Findings improve the thesis that the adoption of international standards decreases earnings management in French and Scandinavian civil law countries better than in German civil law countries and common law countries because of the high disclosure level and the strong investor protection in common law system.

Paananen and Lin (2009) examine the effect of mandatory IFRS adoption by Germany listed companies on the discretionary accruals. The results showed an increase in the level of the discretionary accruals and a low correlation between the accruals and cash flows. In this sense, Paananen (2008) argued that the earnings smoothing decrease after IFRS adoption by Sweden listed companies. The results showed an improvement of the quality of accounting information and a decrease in the earnings smoothing. In their study, Houqe et *al.* (2012) examined the effect of mandatory IFRS adoption and investor protection on the earnings quality. This study was conducted through a sample of 46 countries around the world. Results reveal an improvement of accounting earnings quality associated with the mandatory IFRS

adoption for the countries that have a strong regime of investor protection. This study has shown the influence of macroeconomic factors of countries on accounting practices. Findings approved the importance of investor protection for the quality of the accounting and financial information and the need for mechanisms to limit the earnings management by managers.

Motivated by findings of prior research, investor protection associated with mandatory IFRS adoption has a significant effect on earnings management.

Hypothesis H1: *Investor protection associated with voluntary IFRS adoption decrease significantly the earnings management.*

Hypothesis H2: *Investor protection associated with mandatory IFRS adoption decrease significantly the earnings management.*

4. Research design

4.1. Data and sample

We obtain our data from the database Thomson one banker and the annuals reports of World Economic Forum (WEF). Our sample consists of company data for France, Germany and Belgium listed firms for the period 2000 to 2011. We exclude data from 2005, as this is the year of transition to IFRS. Following prior research (Daske *et al.*, 2008; Francis and Wang, 2008; Houqe *et al.*, 2012), we excluded banks, insurance companies, and other financial institutions because it has a specificities in their accounting practices and the problem to compute discretionary accruals for such entities. We divided the sample into two subsamples (Pre-IFRS period from 2000 to 2004 and Post-IFRS period from 2006 to 2011).

The first subsample consists of 20 companies that voluntary adopt IFRS, represent 18.87% of subsample1, and 86 companies that disclose their financial statements referred to domestic standards (DS), represent 81.13% of the total of subsample 1. For the period from 2000 to 2004 there are a 530 firm – year observations.

In the second subsample, all companies disclosed their financial statements referred to IFRS. For the period 2006 to 2011, the firm – year observations equal to 636. Full sample consists of 106 firms into 11 years belonging 2 countries (namely: France, Germany and Belgium) and 14 industries. The sample selection is summarized in **Table 1** (Panel A and Panel B).

[Insert Table 1 about here]

4.2. Models and variables definitions

The main objective of this paper is to examine the effect of investor protection on earnings management under the transition to international financial accounting standards. Our analysis

will be carried out through multiple regressions to test the functional relationships between variables that have subsequently formed the econometric models to verify hypothesis.

4.2.1. Dependent variable: Earnings management measure

We use the discretionary accruals as a proxy of earnings management. Several studies have used this measure (Jones, 1991; Dechow *et al.,* 1995; Leuz *et al*., 2003; Kothari *et al.,* 2005). To measure non discretionary accruals, we used the model of Kothari (2005):

$$ACCT_{it} = \beta_0 + \beta_1 PPE_{it} + \beta_2(\Delta REV_{it} - \Delta RECEIV_{it}) + \beta_3 ROA_{it} + \varepsilon_{it} \quad \text{Eq. (A.1)}$$

Where:

ACCT: Total accruals, defined as the difference between net income and net operating cash flows;

PPE: Property, plant and equipment for each year deflated by lagged total assets;

(ΔREV - ΔRECEIV): Difference between the change in net sales and the change in net receivable deflated by lagged total assets

ROA: The end of year return on assets estimated as net income over total assets;

$\boldsymbol{\varepsilon_{it}}$: Error term.

To reduce the heteroscedasticity, all variables are divided by total assets of the year (t-1). The accruals calculated on the basis of Eq. (A.1) are not discretionary. A part of the accruals can be described as normal. The discretionary accruals from the modified Jones (1991) model were defined as the residuals from estimating Eq. (A.1):

$$DA_{it} = ACCT_{it} - \left[\hat{\beta}_0 + \hat{\beta}_1 PPE_{it} + \hat{\beta}_2(\Delta REV_{it} - \Delta RECEIV_{it}) + \hat{\beta}_3 ROA_{it}\right] \quad \text{Eq. (A.2)}$$

$\boldsymbol{\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3}$: Estimated coefficients of $\boldsymbol{\beta_0, \beta_1, \beta_2, \beta_3}$.

Dependent variable is the absolute value of discretionary accruals |**DA**|.

4.2.2. Independent variables

4.2.2.1. Investor protection measure: macro to micro

Economic theory assumes that effectiveness institutional frameworks grow to make information more relevant and reduce the transaction costs (Houqe *et al*., 2012). Several studies have addressed the roles and effects of institutions on economic activity. Legal institutions that protect the interests of investors are an integral part of the financial development. Reforms that strengthen countries' legal environment and investor protection contribute to better growth prospects

This study aims to test the impact of investor protection on earnings management under IFRS. Based on the study of La Porta *et al.*, (1997, 1998, 2000); Leuz *et al.,* (2003); Houqe *et al.,* (2012) and Jeanjean (2012), the investor protection will be measured following four macroeconomic index which are: judicial independence, strenght of auditing and reporting, efficacy of corporate board and protection of minority shareholders' interests. Every one of index is provided each year by the World Economic Forum (WEF). It is measured according to a noted scale of 1 to 7, while setting a threshold to determine the degree of effectiveness of the index. This threshold change from one year to another, as it is the same for all companies of a country.

From the pre-cited index, we develop a **score** that is considered as the proxy of investor protection. The **score** consists of calculating the weighted averages of each index for each company of each country at time (t), then, we made the sum of all indexes and finally we divided the sum by the number of indexes. This score will be assigned to the variable investor protection. All the clues have been collected from annual reports of the World Economic Forum

As the index is the same for all firms in a country, so to mitigate the redundancy of data and provide an explanation of dependent variable (earnings management: micro-economic data) by independent variable (investor protection: macro-economic data), we calculated the weighted average of each index by multiplying the value of index by total assets of firm i at time t and divided by total assets of all firms of country j. To calculate the weighted average of judicial independence index, we found this equation:

$$index_1 = weighted\ averages\ of\ judicial\ independence\ index_{ijt} = index_{jt} * \frac{TA_{ijt}}{TA_{jt}} \quad \text{Eq. (A.3)}$$

Each Index will be calculated in the same manner as the **index$_1$**.

Where:
i, j, t is referred, respectively, to firm, country and time;
$\frac{TA_{ijt}}{TA_{jt}}$: Is the proportion of assets of company ***i*** from country ***j*** at time ***t*** from the assets of all companies of country ***j*** at time ***t***.

$$INVP_{ijt} = (index_1 + index_2 + index_3 + index_4)/4 \quad \text{Eq. (A.4)}$$

$$INVP_{ijt} = \left(\sum_{k=1}^{5} index_k\right)\Big/4 \quad \text{Eq. (A.5)}$$

In our study, the score ***"INVP"*** is the proxy of investor protection and is composed of four indexes:

$\boldsymbol{index_1}$**:** Weighted averages of judicial independence index of firm i from country j at time t;

$\boldsymbol{index_2}$**:** Weighted averages of strength of auditing and reporting index of firm i from country j at time t;
$\boldsymbol{index_3}$**:** Weighted averages of efficacy of corporate board index of firm i from country j at time t;
$\boldsymbol{index_4}$**:** Weighted averages of protection of minority shareholders' interests index of firm i from country j at time t.

In the general case the index will be calculated as follows:

$$INVP_{ijt} = (index_1 + index_2 + \cdots + index_{n-1} + index_n)/n \quad \text{Eq. (A.6)}$$

Where: n is the number of index.

$$INVP_{ijt} = \left(\sum_{k=1}^{n} index_k\right)/n \quad \text{Eq. (A.7)}$$

4.2.2.2. Voluntary IFRS adoption variable

From the balance sheet of companies which constitute our sample, on the pre-adoption period of IFRS, we introduced the IFRS as an explanatory variable in terms that there are companies that have voluntarily adopted the IFRS. The choice of the introduction of this variable in regression models is designated to examine the effect of the association between voluntary IFRS adoption and investor protection on earnings management. It is represented by "Vol.IFRS" in our analysis. This variable is measured using a dummy variable that takes the value of "1" if the company has voluntary adopts it and "0" otherwise.

4.2.3. Controls variables

In econometric models we included three controls variables suggested by previous research, to better understand and interpret the functional relationship between the dependent variable and independents variables. First, we controlled for Market to Book ratio (MBKT) measured as the company market value divided by the book value of equity. It's used to measure the growth opportunity of firms. Additionally, we controlled for company size (SIZE) measured as the natural logarithm of total assets. Finally, we included for firm leverage (LEV) measured as the company liabilities divided by the book value of equity.

4.2.4. *Econometric modeling*

In this paper, econometrics models are inspired of Leuz et *al.* (2003). This research is based on comparative study between pre-adoption and post-adoption periods of IFRS.

- ✓ *IFRS pre-adoption period (2000 - 2004)*

This is the period where European listed companies developed their financial statements according to domestic standards, except for some firms which voluntary adopt IFRS. Therefore the model (M1) is represented as follows:

$$|DA_{it}| = \beta_0 + \beta_1 INVP_{it} + \beta_2 Vol.IFRS_{it} + \beta_3 MBKT_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \varepsilon_{it} \quad \text{(M1)}$$

Where; variable |DA| denotes the discretionary accruals of firm i at time t; variable INVP denotes the level of investor protection of firm i at time t; Vol.IFRS is a dummy variable that takes "1" if company voluntary adopts IFRS, "0" otherwise; variable MBKT denotes the Market to book ratio of firm i à at time t; variable SIZE denotes the natural logarithm of firm i at time t; the variable LEV denotes the leverage of firm i at time t and ε is the Error term.

- ✓ *IFRS post-adoption period (2006 - 2011)*

This is the period where all companies which composed the sample developed their financial statements according to IFRS. Therefore, the model (M2) is represented as follows:

$$|DA_{it}| = \beta_0 + \beta_1 INVP_{it} + \beta_2 MBKT_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \varepsilon_{it} \quad \text{(M2)}$$

5. Results and discussions

5.1. Descriptive statistics and univariate tests

Table 2 reports descriptive statistics for the variables in the sample. Two statistical tests will be performed: the means comparison test *(t-test)* and the variances comparison test *(F-test)*. The aim of these tests is to check if there is a significant change in the characteristics of the sample after transition to IFRS.

We observe that on a univariate level |DA| is not significantly change in mean and standard deviation values before and after IFRS adoption (*t-test* = 0.013 and *F-test* = 0.949). The introduction of IFRS doesn't improve the earnings quality of companies in which composed our sample. Among the independent variable, the mean (standard deviation) of INVP decreased from 0.021 (0.042) in the pre-IFRS period to 0.012 (0.021) in the post-IFRS period. In applying mean and variance comparison tests, we conclude that INVP is significantly lower after IFRS adoption (*t-test* equal to 1.986; significant at 5% threshold and *F-test* equal to 2.777; significant at 1% threshold). For control variables, we provide that MBKT and LEV have not significant change in mean value after transition to IFRS, but it is worth noting that the standard deviation of both variables is significantly higher at 1% level after IFRS adoption. The mean comparison test reveals a value of 1.363 and 0.402, respectively for

MBKT and LEV. However, the variance comparison test pointed out a value of 7.032 and 26.347, respectively for MBKT and LEV. Then, we observe that the mean value of SIZE is significantly higher in the post-IFRS period, it is increased from 8.947 to 9.443 (*t-test* takes a value of 2.369; significant at 5% level). Though, the standard deviation value of this variable is lower after the introduction of IFRS but not significantly change (*F-test* takes the value of 1.132). Overall, the univariate analysis showed that transition to IFRS has a significant effect in the tendency of independent and control variables.

[Insert Table 2 about here]

5.2. Bivariate analysis

The bivariate analysis aims to examine the correlation between every two variables of models. Correlations are shown on Panel A and B of **Table 3**. Panel A reports the correlation for pre-IFRS period (2000 to 2004) and Panel B reports the correlation for the post-IFRS period (2006 to 2011).

In the pre-IFRS period, we observe that |DA| and Vol.IFRS are negatively related and the correlation is statistically not significant. In addition, the dependent variable is positively and not significantly related to the variable INVP. The control variables MBKT and LEV are negatively and not significantly related to discretionary accruals. However, the correlation between |DA| and SIZE is negatively and statistically significant at 10% threshold. Then, the VOL.IFRS is positively and significantly related to INVP at 1% level. Similarly, we conclude that MBKT and LEV are positively related and statistically significant at the 1% level. In the post-IFRS period, we observe that |DA| and SIZE are negatively related and statistically significant at 5% level. Then, MBKT is positively and significantly related to INVP and LEV, respectively, at the 5% and the 1% threshold. Indeed, SIZE and LEV are positively and significantly related at the 5% level.

[Insert Table 3 about here]

5.3. Multivariate analysis

After an exploratory study dealing with the sample characteristics and the functional relationships between variables, we perform a multivariate analysis. We focused on the methodological tools that ensuring the verification of hypothesis related to the effect of investor protection on earnings management after the transition to IFRS. Our analysis will be carried out, first, over the pre-adoption period (2000 to 2004), then over the post-adoption period (2006 to 2011), and finally, In order to validate our findings, we use an additional regression model, run on the full sample (pre- and post-IFRS), using interaction variables.

In order to test the existence of specific effects, we apply the homogeneity test to both models M1 and M2. For the model M1, The result of this test confirms the existence of specific effects (*F-value* = 4.99 and *p-value* = 0.000). Similarly, following the run of this test to the model M2, we obtain an *F-value* equal to 22.09 and *p-value* of 0.000. This result shows the existence of specific effects. To specify the types of retained effects (fixed or random effects) and the estimation methods that will be used in the data analysis for both models, we run the Hausman test. This test applied to model M1 displays a *Chi-2 value* equal to 197.24 and a *p-value* equal to 0.000. This result suggests that M1 is a fixed effect model. The same test applied to the parameters of the model M2 shows a value of *Chi-2* equal to 122.81 and a *p-value* equal to 0.000. This result has confirmed that M2 is a fixed effect model.

5.3.1. Voluntary IFRS adoption, investor protection and earnings management

In the pre-IFRS period, our multiple regressions want to investigate the effect of investor protection associated with voluntary IFRS adoption on earnings management. **Table 4** presents the results of estimating the model M1 (Fixed-effects (within) regression). Following the estimation of the model M1 in the pre-IFRS period, results show that adjusted R-square is in the order of 0.0099. This matter stipulating that the independent variables contributed to the explanation of the earnings management at the proportion of 0.99% and the model is globally significant (*F*-statistic = 2.96; *p*-value = 0.015. We observe that the regression coefficient of the variable INVP, is negative and statistically not significant (β_1 = -5.197; *p*-value = 0.676). Indeed, results show that the Vol.IFRS has a negative and statistically significant coefficient at the 5% level (β_2 = -0.071; *p*-value = 0.031). These findings stipulate that voluntary IFRS adoption has a significant effect on earnings management. Among the control variables, we observe that the regression coefficient of MBKT is negative (-0.002) and significant (*p*-value = 0.039). This result could be explained by the way that the growth opportunities of firms decrease earnings management. Lev has a positive (0.0003) and significant coefficient (*p*-value = 0.036). This issue stipulates that more the company is indebted more it manages its earnings upward. Overall results reject our first hypothesis (H1) that supposes the association between Investor protection and voluntary IFRS adoption decreases the earnings management.

5.3.2. Mandatory IFRS adoption, investor protection and earnings management

In the post-IFRS period (model M2), the regression coefficient of the variable INVP is negative and statistically significant at the 1% threshold ($\beta 1$ = -17.806; *p*-value = 0.000). This

result reveals that investor protection has significantly reduces the earnings management after the transition to IFRS. Indeed, during the post-IFRS period, more that investors are protected more than earnings management will be decreased (statistically, when investor protection increased by a unit mean the decrease of earnings management by 17.806 unit). This finding is explained by the importance attached by countries in our sample to the macroeconomics indexes which provide mitigation of opportunistic behaviour of managers, which tends to reduce the earnings management. This results are consistent with Dayanandan *et al.,* (2016), Gonzalez *et al.,* (2014), Liu *et al.,* (2014), Paananen and Lin, (2009) Bushman *et al.,* (2004) and Bhattacharaya *et al.,* (2003). The comparison of the results issued from the estimation of M1 and M2 reveals that mandatory IFRS adoption associated with investor protection decreases the earnings management. Among the control variables, it is important to note that all coefficients of all variables (MBKT, SIZE and LEV) are statistically not significant in the post-IFRS period.

Both models show adjusted R-square values ranging from about 0.0099 for the pre-IFRS period to about 0.0374 for the post- IFRS period. The adj. R^2 of model M1 finds that the explanatory power of this model is very low. We note that investor protection has not contributed to explain the earnings management by applying domestics' standards. The adj. R^2 of the model M2 shows that the investor protection contributed to the explanation of the earnings management at the rate of 3.74% after IFRS adoption.

Results showed that mandatory IFRS adoption associated with investor protection significantly reduces the earnings management. In the one hand, these findings can be explained by the way that our sample is composed by code law countries (Germany, France and Belgium) that have a strong level of investor protection. In the other hand, accounting information referred to IFRS should reflect the true and fair view of economic and financial reality of firm. Earnings management as an accounting practice that used to spread manager's private interest.

Overall, the results reported in **Table 5** supported the reject of our hypothesis H1 that posits that the interaction between voluntary IFRS adoption and investor protection reduces earnings management and the validity of our hypothesis H2 that presumes that the association between mandatory IFRS adoption and investor protection decreases earnings management.

5.3.3. Robustness checks

5.3.3.1. Voluntary IFRS adoption, investor protection and earnings management

In order to validate our hypothesis (H1) in the pre-IFRS period, we run the regression of |DA| on INVP, MBKT, SIZE and LEV only. The results are shown in **Table 4**. The adjusted R-square of this regression is 0.0060. We add the Vol.IFRS as a dummy variable that takes "1" if company voluntary adopts IFRS and "0" otherwise and run regression again. Results show that the adjusted R-square ranging from 0.0060 to 0.0099 and Vol.IFRS is negative (-0.071) and statistically significant at the 5% level (*p*-value = 0.031). Then, we add the interaction of INVP with Vol.IFRS. The regression model noted M3 is computed as follows:

$$|DA_{it}| = \beta_0 + \beta_1 INVP_{it} + \beta_2 Vol.IFRS_{it} + \beta_3 Vol.IFRS_{it} * INVP_{it} + \beta_4 MBKT_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \varepsilon_{it} \quad \text{(M3)}$$

β_3 measure the effect of investor protection on earnings management in the firms that voluntary adopt IFRS. We expect that β_3 be negative and statistically significant in the regression of model M3. The coefficient of Vol.IFRS*INVP is positive (2.017) and statistically not significant and the adjusted R-square has not change (0.0099). Consequently, these results validate the rejection of our first hypothesis (H1).

[Insert Table 4 about here]

5.3.3.2.Mandatory IFRS adoption, investor protection and earnings management

In order to validate our hypothesis (H2), we use in additional regression model. This regression is run on the full sample (2000 to 2011, except 2005), using interaction variables. We introduce POST as a dummy variable that assumes a value of "1" for the post-IFRS period and "0" otherwise and POST*INVP is the interaction variable. The model is defined as follows:

$$|DA_{it}| = \beta_0 + \beta_1 INVP_{it} + \beta_2 POST_{it} + \beta_3 POST_{it} * INVP_{it} + \beta_4 MBKT_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \varepsilon_{it} \quad \text{(M4)}$$

β_3 measure the incremental effect of investor protection on earnings management in the post-IFRS period. We expect that β_3 be negative and statistically significant in the regression of model M4. The results are summarized in **Table 5**. The adjusted R-square of this model (M2) is 0.0374. Then, we add the dummy variable POST and the interaction variable INVP*POST and re-run the regression of model M4. The adj. R^2 increased from 0.0374 to 0.0401. Results show that the interaction variable is negative with the coefficient of -19.644 and statistically significant at the 1% threshold. Comparing these findings with those obtained in the regression of the model M2 related to the post-IFRS period (β_1 = -17.806 and *p-value* = 0.000), we find that the difference between coefficients is significant. Consequently, the

mandatory IFRS adoption associated with investor protection decrease earnings management. These results confirm our hypothesis H2.

[Insert Table 5 about here]

6. Conclusions and summary

This study examines the effect of investor protection on earnings management under international financial reporting standards using 106 firms listed on the stock markets of two countries (namely, Germany, France and Belgium). Our research is based on a comparative study between pre-adoption and post-adoption periods of IFRS. We find that voluntary IFRS adoption associated with investor protection has not effects on earnings management. However, results provide that mandatory IFRS adoption associated with investor protection has significantly reduces earnings management. We can suggest that the legal system, the strength of auditing and reporting, the efficacy of corporate board and the protection of minority shareholders' interests of any country could mitigate the opportunistic behaviour of managers, therefore, it will be possible to protect investors against asymmetric information and decrease the level of conflicts of interest. The regression results find that the earnings management decreases in a high level of investor protection ensured by the introduction of IFRS. These results are consistent with Houqe *et al.,* (2012), Francis and Wang (2008) and Leuz *et al.,* (2003). Findings show that, after transition to IFRS, investor protection and earnings management exhibit a significantly negative association as predicted by our hypothesis H2.

The findings should be interpreted with care because of some limitations. The sample is limited to three European countries. As a consequence, results cannot be generalized to other market or legal systems (e.g. Scandinavian civil law countries, common law countries, China, etc.). The findings of the study have some implications for researchers, practitioners and firms. We found that investor protection reduces earnings management under IFRS in Franco-German code law country. This matter could be at the origin of convergence between standard setters in different countries around the world to increase the quality of accounting information and let it more relevant. Future research could investigate the reasons of non-generalization of IASB standards by all countries. In other trend, where is the future of accounting standards with the emergence of the digital economy and mobile bank.

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Table 1
Sample selection

Panel A Sample distribution by period and country

	Pre-IFRS period (2000 – 2004)				**Post-IFRS period (2006 – 20011)**		**Full sample (2000 – 2011)**	
Country	**Voluntary IFRS**		**Domestic Standards**		**Mandatory IFRS**		**N**	
	Firms	Firm - year observations	Firms	Firm - year observations	Firms	Firm - year observations	Firms	Firm - year observations
Germany (DAX30)	15	75	10	50	25	150	25	275
France (SBF120)	2	10	64	320	66	396	66	726
Belgium (BEL20)	3	15	12	60	15	90	15	165
N	20	100	86	430	106	636	106	1166
%	18.87		81.13		100.00		100.00	

Panel B Sample distribution by industry

Industry	**Firms**	**Firm – year observations**	
	N	**N**	**%**
Retail	5	55	4.71
Manufacturing	16	176	15.10
Biotechnology	5	55	4.71
Construction	11	121	10.38
Consumer goods and services	13	143	12.26
Real state	5	55	4.71
Personal and household products	4	44	3.78
Business services	6	66	5.67
Aerospace and defense	3	33	2.84
Oil and gas	2	22	1.89
Utilities	9	99	8.49
Iron and steel	5	55	4.71
Healthcare	5	55	4.71
Technology	17	187	16.04
	106	1166	100.0

Table 2
Descriptive statistics and comparison tests in Pre- and Post-IFRS periods

Variables	Mean (Pre-IFRS)	t-test	Mean (Post-IFRS)	Std. dev (Pre-IFRS)	F- test	Std. dev (Post-IFRS)	Median (Pre-IFRS)	Median (Post-IFRS)
|DA|	0.065	0.013	0.064	0.267	0.949	0.274	0.020	0.017
INVP	0.021	**1.986****	0.012	0.042	**2.777*****	0.021	0.006	0.004
Vol.IFRS	0.209	--	--	0.407	**--**	--	0.000	--
MBKT	2.648	1.363	2.030	4.365	**7.032*****	1.646	1.811	1.650
SIZE	8.947	**2.369****	9.443	1.571	1.132	1.476	8.927	9.359
LEV	4.155	0,402	2.950	30.259	**26.347*****	5.895	2.108	1.837

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 3
Correlations matrix

Panel A Pre-IFRS period

	|DA|	IFRS	INVT	MBKT	SIZE	LEV
|DA|	1.000					
Vol.IFRS	-0.056	1.000				
INVT	0.063	**0.376*****	1.000			
MBKT	-0.042	0.006	-0.056	1.000		
SIZE	**-0.176***	0.231	0.120	-0.064	1.000	
LEV	-0.012	-0.001	-0.047	**0.740*****	0.041	1.000

Panel B Post-IFRS period

	|DA|	INVT	MBKT	SIZE	LEV
|DA|	1.000				
INVT	0.074	1.000			
MBKT	-0.078	**0.218****	1.000		
SIZE	**-0.2331****	0.081	-0.1191	1.000	
LEV	-0.050	0.072	**0.291*****	**0.215****	1.000

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Tableau 4
Results from regressions of models M1 and M3 related to voluntary IFRS adoption, investor protection and earnings management

	Subsample1 (N = 530) Pre-IFRS period	Subsample1 (N = 530) Pre-IFRS period
Variables	Model (M1)	Model (M3)
Intercept	0.049	0.049
	(0.16)	(0.15)
INVP	-5.197	-5.219
	(-0.42)	(-0.42)
Vol. IFRS	**-0.071****	**-0.072****
	(-2.19)	(-1.98)
INVP*Vol.IFRS		2.017
		(0.18)
MBKT	**-0.002****	**-0.002****
	(-2.09)	(-2.05)
SIZE	0.005	0.005
	(0.15)	(0.16)
LEV	**0.0003*****	**0.0003****
	(2.12)	(2.10)
Adj. R^2	0.0099	0.0099
F-statistic	2.96**	2.93**

*** p < 0.01 ; ** p < 0.05 ; * p < 0.1.

Values in parentheses are *t*-statistics.

Where: $|AD_{it}|$: Discretionary accruals of firm i at time t; $INVP_{it}$: Investor protection of firm i à at time t; $Vol.IFRS_{it}$: Dummy variable that takes "1" if company mandatory adopt IFRS, "0" otherwise; $Vol.IFRS_{it} * INVP_{it}$: interaction variable $MBKT_{it}$: Market to book ratio of firm i à at time t; $SIZE_{it}$: Size of firm i at time t; LEV_{it} : Leverage of firm i at time t; ε_{it} : Error term.

Tableau 5
Results from regressions of models M2 and M4 related to mandatory IFRS adoption, investor protection and earnings management

	Subsample (N = 530) Pre-IFRS period	Subsample (N = 636) Post-IFRS period	Full sample (N = 1166)
Variables	Model (M 2a)	Model (M 2b)	Model (M 4)
Intercept	0.049	**0.358***	-0.012
	(0.21)	(1.74)	(0.89)
INVP	-5.219	**-17.806*****	**-5.649****
	(-1.48)	(-4.69)	(-2.04)
POST			**-5.353*****
			(-3.51)
INVP*POST			**-19.644*****
			(-4.97)
MBKT	**-0.002****	-0.001	-0.0006
	(-2.09)	(-0.42)	(-0.21)
SIZE	0.005	-0.028	0.009
	(0.15)	(-1.31)	(0.72)
LEV	**0.0003****	0.000	0.000
	(2.12)	(0.29)	(0.17)
Adj. R^2	0.0060	0.0374	0.401
F-statistic	**2.92****	**5.98*****	**6.46*****

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.
Values in parentheses are *t*-statistics.
Where:$|AD_{it}|$: Discretionary accruals of firm i at time t; $INVP_{it}$: Investor protection of firm i à at time t; $POST_{it}$: as a dummy variable that assumes a value of "1" for the post-IFRS period and "0" otherwise; POST*INVP is the interaction variable; $MBKT_{it}$: Market to book ratio of firm i à at time t; $SIZE_{it}$: Size of firm i at time t; LEV_{it} : Leverage of firm i at time t; ε_{it} : Error term.