How have the IAS/IFRS adoption affected earnings management in EU? The effect of the absence/divergence of regulation and of legal enforcement

Abstract: This paper aims to investigate the effect produced by the adoption of IAS/IFRS on earnings management in European Union.
We calculate four indexes for the periods 2000-2003 and 2006-2009 to identify different reasons that could lead insiders to manipulate earnings and by comparing them we observe that the IAS/IFRS first-time adoption produced different effects on earnings management depending on the countries analysed and the kind of earnings management investigated. Moreover, while we find a positive relation between the reduction of earnings management and the extent to which IAS/IFRS regulates issues not covered by domestic standards, on the contrary we do not find any relation between the such reduction and the existing divergence between domestic standards and IASB standards. Finally, our findings also show a positive and significant relation between the reduction of the earnings management and the level of the legal enforcement of each country.

Keywords: earnings management, accounting quality, IASB standards.

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How have the IAS/IFRS adoption affected earnings management in EU? The effect of the absence/divergence of regulation and of legal enforcement

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1. Introduction

The mandatory adoption of IASB standards as a consequence of the EU Regulation 1606/2002 has been one of the most revolutionary changes that occurred in the European accounting regulation.
The goal of the IASB is to issue accounting standards of high quality, so that the mandatory adoption of these accounting standards should improve the quality of financial reporting across European countries. The improvement of accounting quality brings positive desirable consequences (Soderstrom and Sun 2007) such as the lowering of the cost of capital (Leuz and Verrecchia 2000) and the improvement of the international capital mobility (Young and Guenther 2002).
Literature pointed out that the adoption of a particular set of accounting standards is only a component of the process of improvement in accounting quality (Dao 2005; Soderstrom and Sun 2007), highlighting the importance of considering also economic and political factors (Ball, Robin and Wu 2003) when valuing possible effects of the transition to new accounting standards, because

the change of «only one piece of the mosaic may not be the optimal solution if other institutions stay unchanged» (Ding, Hope, Jeanjean and Stolowy 2007, p. 2).

Being impossible to directly measure accounting quality, we need several indicators that help us to assess it. Literature highlighted that accounting quality can be operationalized in several ways, amongst which the most used are earnings management, value relevance and timely loss recognition (Barth, Landsman and Lang 2008).

In this paper we focused on earnings management in order to investigate the effect of the mandatory adoption of IASB standards across European countries.

More in detail, we analysed whether this mandatory adoption has reduced earnings management and why it has produced different effects in countries where IASB standards have been applied.

To answer our research questions we calculate earnings management in the 14 countries belonging to the EU at the issuance of EU Regulation 1606/2002 for the period from 2000-2009.

In order to avoid that pre-adoption and transition effects could bias our research results we excluded from our sample the pre-adoption year (2004) and the year of the first-time adoption (2005). Therefore we include in our sample four years of consolidated financial statements issued in accordance with domestic standards (2000-2003) and four years in accordance with IASB standards (2006-2009).

As to the effect of the transition on the level of earnings management we found different results, depending on the countries analysed and the measure of earnings management investigated, confirming that the interdependence between accounting standards, institutional variables and firms incentives could lead to a different effect of an accounting standards change (Soderstrom and Sun 2007, p. 676).

As to the countries factors that may have affected the impact of the mandatory adoption of IASB standards on earnings management, we found a positive and significant relation between the reduction of the earnings management and both the extent to which IAS/IFRS regulates issues not covered by domestic standards and legal enforcement.

These results confirm the expectation that the adoption of a high quality set of accounting standards has reduced the earnings management more in countries where lack of regulation by domestic standards allowed more accounting discretion, and the quality of the enforcement makes effective the transition to the new set of accounting standards.

The contribution of this paper to existing literature is threefold. First, this paper analysed a longer period of time compared to the previous papers (Callao and Jarne 2010; Chen, Tang, Tjiang and Lin 2010) that investigated the effect of the mandatory adoption on the earnings management. Second, our research analysed the effect of the mandatory adoption "country by country" and, by the Principal Component Analysis (PCA), we built an aggregate score that allowed us to compare European countries to each other as to the effect of such mandatory adoption on earnings management. Third, to our knowledge, this is the first paper that investigated the impact of country factors on the effect of the mandatory adoption of IASB standards on earnings management.

Our research could be of interest both for researchers and regulators. As to researchers, this paper contributes to enlarge existing literature that investigated the effect of different accounting rules on earnings management, also by detecting the effect of country factors on the transition to a new set of accounting standards. As to regulators, our research highlights that the transition to a new set of accounting standards produced better results in countries where previous domestic GAAPs did not regulate some issues, and where the level of enforcement is high enough to make the transition effective.

Our paper continues as follows. In section 2, we review the existing literature as to the effect on earnings management of the transition from domestic GAAP to IASB standards. In section 3, we explain the research design, while in section 4 we discuss our sample selection strategy. In section 5, we show our findings while section 6 contains conclusions, limitations and the possible future developments of our work.

2. Systematic literature review

Earnings management could be defined as the manipulation of firms' economic performance in order either to mislead stakeholders or to influence contractual outcomes that depend on reported accounting numbers (Healy and Wahlen 1999; Leuz et al. 2003; Chen, Tang, Tjiang and Lin 2010). Literature pointed out that the earnings management exists not only with accounting policies, but also when insiders manipulate real transactions in order to show a level of earnings in accordance with their own interest (Dechow and Skinner 2000; Callao and Jarne 2010) a practice often used when regulators tight accounting standards to limit earnings management (Ewert and Wagenhofer 2005).

As stated in the introduction, the mandatory adoption of a set of high quality standards, like the IAS/IFRS are, should reduce the earnings management. This result could be achieved for three main reasons.

Literature (Barth, Landsman and Lang 2008) pointed out that the IASC and the IASB made steps to remove many alternative accounting treatments that are allowed in previous standards. This reduction of possible alternatives should limit the possibility for managers to choose between accounting treatments, with the only goal of reaching their own interests.

Moreover, in many European countries domestic standards do not rule different accounting issues that have been covered by IAS/IFRS (Ding et. al 2007). Also for this reason the adoption of IASB standards should limit the discretion of insiders, limiting earnings management.

Finally, the wide diffusion around the world of IASB standards makes stakeholders more able to control financial statements issued in accordance with these standards. As a consequence, managers should be prompted to limit their opportunistic behaviours because of the ability of stakeholders to recognize them (Chen, Tang, Tjiang and Lin 2010).

On the contrary, reasons exist that could lower the positive effect of the introduction of IASB standards on the reduction of earnings management, and more generally, on the accounting quality.

First of all, the literature pointed out that the improvement of an accounting system[1] cannot be achieved by simply adopting IASB standards (Ding, Hope, Jeanjean and Stolowy 2007) because there are features that affect the effect of the introduction of IASB standards on accounting quality. One of the most cited examples is that if the enforcement mechanism was too lax, it could impair the positive effect of the adoption of new standards (Ball, Robin and Wu 2003; Hope 2003; Barth, Landsman and Lang 2008).

Moreover opponents to IASB standards argued that the adoption of a single set of accounting standards for different countries could not improve the accounting quality because accounting standards should be developed having as a reference the institutional factors and the business environment of each country. Thus, the mandatory adoption of IASB standards avoids issuing

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[1] We refer to accounting system as a set of financial reporting practices used to issue annual reports (Nobes and Parker 2010, p. 29).

standards tailored for each particular contest, lowering the quality of an accounting system, assuming this quality as the ability to measure the underlying economic situation.

Finally, despite the mentioned efforts made by the IASB to remove alternative accounting treatments, literature highlighted that too many alternatives still exist (Nobes and Parker 2010) and IASB standards also states criteria, like fair value, with an high level of subjectivity (Callao and Jarne 2010). Both these two features allow opportunistic behaviours of the managers when they issue financial statements with the consequent possibility of earnings management.

Empirical evidences about the effect of the transition from local GAAPs to IASB standards highlight different results. Van Tendeloo and Vanstraelen (2005) investigated the effect on the earnings management of the voluntary adoption of IASB standards. They analysed the case of Germany having as a sample 636 firm-year observations relating to the period 1999-2001. They found that entities that have voluntarily adopted IASB standards did not have significant changes as to earnings management.

Barth, Landsman and Lang (2008) analysed the change in accounting quality of firms listed in 21 countries that adopted IAS/IFRS in the period 1994-2003. They investigated the three dimensions of the accounting quality cited above, that is, earnings management, value relevance and timely loss recognition; they found that firms adopting IAS/IFRS have a better accounting quality. With reference to earnings management, their results show both less earnings smoothing and less managing of earnings towards a target.

Chen, Tang, Tjiang and Lin (2010) analysed the effect on accounting quality of the introduction of IAS/IFRS standards in Europe, by having as a sample the listed entities of 15 EU countries for the period 2000-2007.

As to earnings management, they found both less managing earnings toward a target and lower magnitude of absolute discretionary accruals.

Callao and Jarne (2010) investigated the effect of the mandatory adoption of IASB standards on earnings management in 11 EU countries for the period 2003-2006 by including in their sample only non-financial firms. They chose to investigate the earnings management by using the level of discretionary accruals estimated by the Jones model (1991) as modified by Dechow et al. (1995) and by controlling for book to market ratio and current operating cash flow, as suggested by Larcker and Richardson (2004)

Differently from the previous authors, they pointed out that earnings management increased after the adoption of IAS/IFRS standards. As to current discretionary accruals, they found a significant increase for France, Spain and UK, and not significant changes (both for increase and for decrease) in the other countries. With reference to long-term discretionary accruals, they found that all the changes are significant, but the number of firms in which they increase exceeds the number of firm in which they decreased (Callao and Jarne 2010, p. 174).

Zegal, Chtourou and Sellami (2011) analysed the mandatory adoption of IASB standards in France, investigating a sample of 353 listed groups for the period 2003-2006. They focused on discretionary accruals as a proxy for the earnings management, by estimating them with the Kothari et al. (2005) cross sectional model. They found a reduction of the earnings management as a consequence of the mandatory adoption of IASB standards.

Recent research just described shows conflicting results that go from the reduction (Barth, Landsman and Lang 2008; Chen, Tang, Tjiang and Lin 2010; Zegal, Chtourou and Sellami 2011) to the increase (Callao and Jarne 2010) of earnings management, with one case where the transition

from domestic GAAPs to IASB standards did not produce significant differences (Van Tendeloo and Vanstraelen 2005).

We think that differences as to institutional context, cultural factors and business environment make European accounting systems still different from each other, despite the adoption of a single set of accounting standards.

Therefore we believe that is not consistent to analyse the effect on the earnings management of the mandatory adoption of IASB standards, having as a reference all the European entities, because of the possibility of a compensation of opposite results. As a consequence, we think necessary to investigate the effect of such adoption in each single country belonging to EU at the time of the issuance of Regulation 1606/2002.

The investigation of the effect of the mandatory adoption of IASB standards should also consider that different reasons could lead insiders to manipulate earnings.

For example, insiders could be interested in showing a smoothed level of earnings, by concealing firm's economic performance or by hiding cash flow decrease (Leuz et al. 2003), in order to avoid scrutiny from outsiders (Lang, Ready and Wilson 2006) and making more easy the acquisition of private control benefits, in overvaluing or undervaluing net income in order to influence the analysts' earnings forecasts (Dechow and Skinner 2000), in hiding small losses (Burgstahler and Dichev 1997, Degeorge et al. 1999; and Burgstahler and Eames 2003) in order to avoid showing a negative performance.

Different reasons to manipulate earnings could bring to different effects of the mandatory adoption of IASB standards on earnings management because, for example, it involves countries with highly developed equity markets, with the following importance of analysts' earnings forecasts, and countries with less developed equity markets, with the following importance of avoiding scrutiny from outsiders as governments and banks.

Therefore, when investigating the effect of the mandatory adoption of IASB standards on earnings management, we do not think correct to investigate only one dimension of it, being possible, and in our opinion probable, to find different results depending on the kind of earnings management analysed.

As a consequence, we formulate the following hypothesis:

Hypothesis 1: The mandatory adoption of IAS/IFRS standards produced different effects on earnings management depending on the country analysed and the kind of earnings management investigated.

Once verified that the mandatory adoption of IASB standards have produced different effects on earnings management depending on the countries analysed, it is interesting to investigate why the same event – the mandatory adoption of IASB standards – brings to these different effects.

The first reason to investigate refers to the extent of changes that the adoption of IASB standards produces in accounting rules that entities must comply with.

Changes produced by the adoption of the new set of standards could be generated by two different situations.

The first one refers to the absence of regulation of a particular issue by domestic standards, while the same issue is ruled by IAS/IFRS. Ding et. al. (2007) proposed the absence index to measure the extent to which accounting rules contained in IAS/IFRS are missed in domestic standards.

It is reasonable to expect that the adoption of IASB standards in countries where there are many issues not ruled by domestic standards should limit the possibility that insiders manipulate earnings in accordance with their own interests.

Therefore we formulate the following hypothesis:

Hypothesis 2: The reduction of earnings management as a consequence of the mandatory adoption of IASB standards is positively related to the extent to which IAS/IFRS regulates issues not covered by domestic standards.

The second reason is that the transition to IAS/IFRS could bring changes in accounting regulation because the same issue is ruled by IASB standards differently to domestic standards. Ding et. al. (2007) proposed the divergence index to measure the extent to which accounting rules contained in IAS/IFRS differ from domestic standards.

Many countries (eg. UK, Ireland) developed sophisticated accounting principles before the transition to IAS/IFRS. In these cases, even though the mandatory adoption produced changes in rules to accomplish with in issuing financial statements, these changes did not necessarily reduce discretion of insiders.

Differently from the absence of rules, the reduction of divergence between local and international accounting standards may not reduce earnings management.

Therefore we formulate the following hypothesis:

Hypothesis 3: There is not a significant relation between the change of the earnings management and the extent of differences between domestic GAAPs and IASB standards

The other reason that could explain the different impact of the mandatory adoption on the earnings management relies on institutional variables in each country.

Literature highlighted the relation between earnings management and institutional variables, such as the investor protection and the level of enforcement (Leuz et. al. 2003, Burgstahler, Hail and Leuz 2006, Lang, Raedy and Smith 2006, Callao and Jarne 2010). In this paper we are interested in investigating whether there is a significant association between the institutional variables and the "change" in the level of earnings management, due to the transition to IASB standards.

At a general level it may be reasonable to believe that, being institutional variables in each country constant over time, they would not affect the impact of IAS/IFRS on the level of earnings management.

If we compare the level of the earnings management pre and post-IAS/IFRS adoption for each country, each country should act as its own control, limiting/eliminating the effect of business environmental (Chen et al. 2010).

This reasoning could lead to the convictions that institutional variables affect the level of the earnings management, but not the effect on it of the transition to a new set of accounting standards.

This belief could be right for institutional variables that influence the level of the earnings management and not affect the process of the adoption of a new set of accounting standards.

On the contrary, when the institutional variables affect the effectiveness of the transition, such as the legal enforcement should be, we expect a positive relation between this institutional variable and the change of earnings management.

As previous literature pointed out (Ball, Robin and Wu 2003; Hope 2003; Barth, Landsman and Lang 2008), the success of the transition to a new set of accounting standards is affected by the existence of an effective mechanism of enforcement. As a matter of fact Hope suggested that absent adequate enforcement even the best accounting standards will be inconsequential. If nobody takes action when rules are breached, the rules remain requirements only on paper (Hope, 2003, p. 238) Our research hypothesis is the following.

Hypothesis 4: There is a positive relation between the reduction of the earnings management and the level of the legal enforcement.

3. Research design

Researchers do not usually investigate earnings management at a general level, but prefer to identify the particular reasons which lead insiders to manipulate earnings (e.g. earnings smoothing, hiding the fall in cash flow, etc.); once such reasons are defined, they analyse earnings management by a suitable model or assess an earnings management score in case more indexes have been calculated.

Following Leuz et al. (2003), we calculate four indexes that measure four different kinds of earnings management related to different reasons that allow insiders to manipulate earnings.

More specifically, these four indexes measure the insiders' attitude to:
* smooth earnings over time;
* hide cash flow decreases;
* overvalue or undervalue net income;
* hide small losses, to disclose small profit.

These indexes are useful to detect earnings management, but each one of them is able to investigate a specific reason that could lead insiders to manipulate accounting data, hence, they could lead to different results in terms of increase (reduction) of earnings management.

In this research, we will calculate different earnings management measures for the event periods 2000-2003 and 2006-2009, in order to verify if earnings management increased or reduced after the adoption of the IASB standards.

As the Regulation 1606/2002 obliged listed companies to adopt such standards in 2005, we exclude fiscal years 2004 and 2005 because, as they capture either pre-adoption or transition effects, they could bias our results.

Therefore, while the earnings management indexes for the period 2000-2003 reflect earnings management under the national GAAPs, the 2006-2009 ones reflect the one under the IASB standards.

3.1 Smoothing earnings over time

The first measure of earnings management gives evidence of how insiders have smoothed earnings over time.

For each firm listed in a common stock market and with specific reference to the period analysed, the index will be calculated by dividing the standard deviation of the firm's operating earnings by the standard deviation of its cash flow from operations. The scaling by the cash flow from

operations controls for differences in the variability of economic performance across firms (Leuz et al. 2003, p. 509).

The median of these ratios, calculated for such firms, yields the country specific measure of the smoothing index, useful for our goals.

The index decrease (increase) suggests us that insiders increased (decreased) the earnings smoothing after the adoption of IASB standards. As a matter of fact, a low level of the index shows that insiders manipulate earnings in order to reduce its variability.

3.2 Hiding the fall in cash flow

To detect the possibility that insiders could have hidden the fall in cash flow, we use the Spearman's rank correlation coefficient (rho) between the change in total accruals (ΔTA_{it}) and the change in operating cash flow ($\Delta Cash_{it}$), both scaled by lagged total assets, as proposed in Leuz et al. (2003). According to them, if at the end of the period the firm's cash flow is lower than the one at the beginning of the same period, insiders could compensate this reduction reporting inflated earnings. This attitude tends to mislead the investors' perception of the real firm's performance.

As suggested by Dechow (1994), who calculate similar correlations using Pearson's rho, accrual accounting leads to a low negative correlation, but she explained that if its absolute value became too high, the insiders could have manipulated accruals in order to compensate a reported variation in operating cash flow. This feature allows us to conclude that if the correlation, measured by the rho, becomes more negative, the rho decreases, highlighting an increase of the earnings management.

3.3 Overvaluing or undervaluing net income

The manipulation of accruals could also lead to overestimate or underestimate net income in order to make it consistent with insiders' goals.

To investigate this feature of earnings management, we will use the median of the absolute value of accruals scaled by the absolute value of cash flow (Leuz et al. 2003, p. 510). The scaling with the absolute value of cash flow is useful to avoid biases due to differences in firm size and performance.

Because the higher the index, the more earnings management exists, the increase (decrease) of this median highlights the earnings management increase (decrease).

3.4 Hiding small losses

According to the prior research of Hayn (1995) whose results have been confirmed by Burgstahler and Dichev (1997), Degeorge et al. (1999) and Burgstahler and Eames (2003), insiders tend to conceal small losses and earnings declines in order to disclose a small positive net income, taking into account that hiding small losses is simpler than hiding the larger ones.

To detect this possible kind of earnings management, we will use the ratio between the number of firms that disclose "small profit" on the ones that disclose "small losses", as suggested by Burgstahler and Dichev (1997).

The change over time of this ratio is assumed to detect the increase (decrease) of earnings management in the years analysed.

To evaluate if there are small profit/small losses, Burgstahler and Dichev (1997) and Leuz et al. (2003) assume that if net earnings after taxes, scaled by lagged total assets, are in the range (0, 0.01], the company discloses small profits. Otherwise if net earnings after taxes, scaled by lagged total assets, are in the range [-0.01, 0), the company discloses small losses.

3.5 The aggregate earnings management score

To reduce the random measurement error of single earnings management indexes and to parsimoniously summarize their underlying latent construct, we will calculate a synthetic measure of earnings management change, the so-called aggregate score (AS_i).

More specifically, the aggregate score will be calculated taking into account the changes that the single earnings management indexes register from a period (2000-2003) to another (2006-2009), in order to construct a metric that increases when earnings management reduces.

Principal component analysis (PCA) is very useful to calculate such score, as it is considered a powerful statistical tool, used in different fields, for data reduction purposes. For instance, in accounting research it has been used in order to summarize investors and firms' characteristics (Bonner et al. 2003; Baik et al. 2009).

In our case, the generation of the factors, that summarize the information hold in the changes of our four indexes, passes through the standardization of these differences, by subtracting the mean and dividing them by the standard deviation.

Once standardized the differences of the indexes, we will calculate the aggregate score of each country, taking into consideration the information hold in the principal factor that, between the generated factors, is the one that explains the larger fraction of variability.

The aggregate score gives us a score, for each country, that allows us to evaluate if the earnings management registered a higher (a lower) level of decrease, after the adoption of IASB standards.

3.6 The determinants of the IAS/IFRS impact on earnings management changes over time

In section 2 we have assumed that the introduction of a new set of accounting standards produces different effects on earnings management in each country, because of several variables that could diversify this effect, facilitating or making it difficult.

More in detail we hypothesised some possible relations between our aggregate score and the following country characteristics:

- the extent to which there are rules contained in IAS/IFRS but missed in local GAAPs, measured by the Ding's et al. (2007) absence index;
- the extent to which common issues are differently regulated in IAS/IFRS and in local GAAPs, measured by the Ding's et al. (2007) divergence index;
- the legal enforcement, calculated similarly to La Porta et al. (1998), as the mean score across an assessment of rule of law and the corruption index. Both of these scores have been downloaded from the World Bank web site.

Regressing the aggregate score (AS_i) obtained by the PCA with the country characteristics listed above will give us evidence on whether such characteristics are associated with the change of earnings management when a country adopts an high quality set of accounting standards.

Possibilities exist that omitted variables could bias our research results. Therefore in order to control the consistence of OLS coefficients, we run a 2SLS regression that considers as instrumented variables the same OLS regressors and as instruments, whose relevance will be demonstrated, a measure of investors' protection and the countries' legal origins.

With regard to the first instrument, the anti-director rights index is assumed as our measure of investor protection, as in Leuz et al. (2003) where this variable is used to measure the outside investor rights; this index has been calculated by La Porta et al. in 1998 and it has been recently updated by Spamann (Spamann, 2010).

With regard to the countries' legal origins, they have been considered by Leuz et al. (2009) and Levine (1999) as valid instruments, because they are predetermined and exogenous. So, we will use dummy variables that, from La Porta et al. (1998), distinguish Common (English), French, German and Scandinavian legal origins.

4. Sample selection strategy

To investigate whether IAS/IFRS adoption has increased or has reduced the earnings management practice, we calculate the earnings management indexes and the aggregate scores by analysing accounting data of 1,280 groups listed in 14 European countries, which have joined up the European Union until 2002, the year in which the Regulation 1606/2002 has been issued.

We cannot consider all the 15 countries because of the specific characteristics of Luxembourg, whose listed companies either belong to the financial sector or data are not available on the Datastream database, features that, as we will explain later, excludes entities from our sample.

Initially, the sample counted 3,573 listed firms. Following Leuz et al. (2003), the firms that belong to the financial sectors (banks and insurance companies) have been eliminated (n=338). Then, we have excluded the firms that adopted IAS/IFRS before 2005 (n=441) and the firms that have adopted U.S. GAAPs (n=136). Finally, firms with missing data have been excluded; in other words we have not considered companies for which the Datastream database has not allowed us to collect data for one or more years included in our event periods (n= 1,378).

The eliminations described above led us to consider 1,280 companies.

Table 1 summarizes our sample selection strategy.

[Insert table 1]

Excluding companies where accounting series are not available for one or more years guarantee an homogeneous sample. In this way, the companies whose accounting data have been collected for the period before the introduction of IASB standards are exactly the same for which accounting data have been collected for the period after such introduction.

Moreover, our sample selection strategy avoids that the values of the earnings management indexes might be biased by missing values in the accounting series. In other words, such eliminations guarantee that abnormal differences between the indexes calculated for each country are not due to missing values.

Table 2 summarizes the specific country features that are the legal origins, the absence and the divergence indexes, the legal enforcement index and the investor protection.

[Insert table 2]

5 Results

Table 3 summarizes our findings about the four earnings management indexes illustrated above, both for the period 2000-2003 and 2006-2009[2]. In order to facilitate the reading of the following table, we recall that when the first and the second index increase, we will conclude that earnings management goes down and when it reduces, earnings management goes up. Instead, when the third and the forth index increase, we will conclude that earnings management growth goes up also, and when it reduces, earnings management goes down.

[Insert table 3]

Only for France and Austria all the indexes reveal a decrease of earnings management. In the other twelve countries the indexes proceed to different results about earnings management, depending on the country analysed and the kind of earnings management investigated, confirming our Hypothesis 1.Our findings also show that the introduction of IASB standards has not led to a systematic improvement of the earnings management, so this result seems to confirm that the adoption of a particular set of accounting standards is only a component of the improvement of accounting quality (Dao 2005; Ding, Hope, Jeanjean and Stolowy 2007; Soderstrom and Sun 2007). The investigation of the reasons that could justify these differences will be detected in the second part of our research and passes through the determination of the aggregate score.

5.1. The aggregate earnings management score

In order to judge the impact that IASB standards had on earnings management, an aggregate score (AS_i) of the changes that our earnings management indexes register from a period (2000-2003) to another (2006-2009) has been calculated with Principal component analysis (PCA). Before calculating such differences, the first two indexes have been inverted, in order to have four indexes whose changes lead to the same conclusions in terms of increase (decline) of earnings management. In a first step, PCA generated two factors, but only the first one has been considered useful for our purpose of data reduction. It explains 45 percent of the total variations in the original variables and its eigenvalue is 1.74. We have assumed this factor able to predict our aggregate score because the mean Kaiser-Meyer-Olkin measure of sampling adequacy (Kaiser, 1974) is greater than 0.5, so, as literature suggest (Song, Han Yi, 2010; Stewart, 1981), it captures the underlying common factor of our four individual variables.
In a second step, we have estimated the four coefficients (c_i) of our components, in order to calculate the aggregate score for each country.
As in Bharath, Sunder and Sunder (2008, p. 9), our aggregate score will be obtained as follow:

$$AS_i = -(-0.509 std\Delta Index1 + 0.289 std\Delta Index2 + 0.083 std\Delta Index3 + 0.473 std\Delta Index4) \quad [1]$$

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[2] With the Wilcoxon matched-pairs signed-rank test we tested the null hypothesis that the indexes calculated for the period 2000-2003 are not statistically different from the matched-pairs ones, calculated for the period 2006-2009. Not considering the increase of the earnings smoothing index, we always reject the null hypothesis, so the adoption of IASB standards had a significant impact on the earnings management change over time.

Following Bharath, Sunder and Sunder (2008), the linear combination presented above has been multiplied by - 1 in order to construct a metric that increases when earnings management reduces. So, the higher is the level of AS_i the stronger has been the reduction of earnings management after the adoption of the IAS/IFRS standards.

Table 4 summarizes the four factor coefficients for each component (ci), the matched-paired indexes' changes (stdΔIndex$_i$) and the aggregate score, calculated as shown in equation [1], whose mean is zero and whose standard deviation is 1.

[Insert table 4]

The value of the aggregate scores calculated above allows us to rank countries according to the relative impact that IASB standards had on earnings management, as shown, in a more readable way, in Table 5

[Insert table 5]

This table suggests that the sign and the value of this score indicate the magnitude of such impact.

The interpretation of results shown in Table 5 should be done having in mind that the mean of the aggregate score is equal to zero.

More in detail, table 5 shows a rank that allows us a classification of the countries based on the reduction of earnings management after the mandatory adoption of IASB standards. Therefore position and value of each country should be read taking into account the ones of the other countries included in our sample.

The aggregate score disclosed in table 5 confirms again that the introduction of IASB standards has not a homogeneous impact on European countries in terms of earnings management reduction.

In the next section we will analyse the main countries characteristics that could have influenced such impact.

5.2. Variables that could have influenced the effect of the adoption of IASB standards on earnings management

In section 2, we hypothesized that the effect of the adoption of IASB standards could be affected by the absence of regulation in domestic standards compared to IAS/IFRS standards (absence index) and the legal enforcement. On the contrary, we hypothesized that divergences between domestic GAAPs and IAS/IFRS standards have not significantly affected the impact of the mandatory adoption of IASB standards on earnings management.

To verify such influences, we regress our aggregate score (AS_i) with the absence index (AI_i), the divergence index (DI_i) and the legal enforcement (LE_i). Table 6 shows our findings using OLS and suggests that only the absence index is positively related to the aggregate score with a coefficient statistically significant.

[Insert table 6]

The limited number of observations, as in Leuz et al. (2003) or in similar studies, does not bias our research results. The reasons are twofold. First, it cannot be extended because our research questions involve the countries belonging to EU at the time of IAS/IFRS adoption that, excluding Luxembourg, are 14; second our regressions have been run in order to describe the sign of the relation between variables and not to infer our findings to the population of the IAS/IFRS compliant countries.

Results shown in Table 10 seem to confirm our Hypothesis 2 and Hypothesis 3. The reduction of earnings management seems to be positively related to the extent to which IAS/IFRS regulates issues not covered by domestic GAAPs (coefficient of the absence index (AS_i) 0.04; p-value 0.031), while there is not a significant relation with the extent of the differences between domestic and IASB standards (coefficient of divergence index (DI_i) 0.06; p-value 0.258).

According to our results, a higher level of our aggregate score is observed in the countries with a higher level of the absence index. As our aggregate score is a metric that increases when earnings management reduces, the OLS regression suggests that the introduction of a set of high quality accounting standards is more effective on the earnings management reduction in countries with a higher absence index.

Results of Table 6 seem not to confirm our Hypothesis 4. As a matter of fact even though there is a positive relation between the level of legal enforcement and the variation of earnings management (coefficient of legal enforcement (LE_i) 0.60), such relation is not statistically significant (p-value 0.23).

As our findings could suffer from endogeneity bias, we run a 2SLS considering as instrumented variables our OLS regressors and as potential instruments the anti-director rights index, that is a proxy of investor protection (IV_i) and, as suggested by literature, the dummy variables that indicate the legal origins of our countries.

As shown in Table 7, our instruments are relevant, as their correlations with the instrumented variables are significantly different from zero. Moreover, as the F-statistics of the first stage regressions are generally greater than 10 (for A_i and Le_i) our findings are not not biased by the presence of weak instruments (Stock and Watson, 2009).

[Insert table 7]

Table 8 shows our findings about the 2SLS regression.

[Insert table 8]

Our findings suggest that also with 2SLS regression the absence index coefficient is positive and statistically significant. While its standard error does not change, the significance passes from 3.1% to 1.1%. Running a regression with instrumental variables, a higher level of our aggregate score corresponds to a higher level of the absence index. As such score is a metric that increases when earnings management reduces, our findings suggest that the introduction of a set of high quality accounting standards is more effective on the earnings management reduction in countries with a higher absence index. Therefore, our Hypothesis 2 continues to be confirmed by results of 2SLS as the reduction of earnings management as a consequence of the mandatory adoption of IASB standards is positively related to the extent to which IAS/IFRS regulates issues not covered by domestic standards. With regard to divergence index, its coefficient continues to be not significant

also with 2SLS, so our Hypothesis 3 has been validated. With regard to legal enforcement its coefficient is positive and respect to the OLS regression becomes significant at the traditional level of 5%. Also its standard error passes from 0.46 to 0.40.Our findings show that the decline of earnings management as a consequence of the adoption of IASB standards is positively related to the level of legal enforcement in each country. So, also Hypothesis 4 has been validated.

6. Conclusions

In this paper we investigated the effect of the mandatory adoption of the IASB standards on earnings management in the European countries belonging to EU at the time of issuance of EU Regulation 1606/2002.

As there are different kinds of earnings management, we measured it with different metrics; research results confirmed our expectation that the mandatory adoption of IASB standards produced different effects, depending on the kind of earnings management analysed and the country investigated. So, stand-alone, an high quality set of accounting standards (as IAS/IFRS are) is not enough to guarantee a decline of earnings management, because also other variables could facilitate or make it difficult. For instance, we found that the earnings management decreases after the adoption of IASB standards had been significantly correlated to the extent to which domestic standards do not rule some topics covered by IAS/IFRS; on the contrary, the extent of the divergence between local GAAPs and IASB standards had not an effect on this reduction.

Finally, regarding governance indicators, we found that legal enforcement seems to be positively related with the reduction of earnings management after the mandatory adoption of IASB standards. In other words, their adoption has been by far more effective on earnings management decline in countries with higher level of legal enforcement.

Our research faces the problem that we ran regressions with limited number of observations, as in Leuz et al. (2003) or in similar studies. Differently from such researches on the one hand our problem is unavoidable, because our research questions refer to the countries belonging to EU at the time of IAS/IFRS adoption, but on the other hand our regressions have been run in order to describe a relation between variables and not to infer our findings to the population of the IAS/IFRS compliant countries.

Future further research not only could extend this kind of research also to other countries, allowing inference to the population of the IAS/IFRS compliant countries, but these research could also investigate the impact that other variables could have on earnings management after the introduction of such standards.

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Tables:

Table 1: Sample selection strategy

Countries	Initial sample	Financial institution	IAS/IFRS voluntary adoption	U.S. GAAPs	Accounting series not available	Final sample
Austria	94	14	53	5	2	20
Belgium	90	13	26	1	14	36
Denmark	246	49	16	0	97	84
Finland	129	11	17	0	21	80
France	528	37	17	3	133	338
Germany	401	18	220	93	0	70
Greece	293	22	15	2	121	133
Ireland	51	6	0	2	19	24
Italy	245	34	12	2	73	124
Netherland	164	12	3	3	68	78
Portugal	53	10	5	0	11	27
Spain	125	19	5	1	30	70
Sweden	339	34	9	3	147	146
U.K.	815	59	43	21	642	50
Total:	3,573	338	441	136	1,378	1,280

Table 2: Legal origins, absence index, divergence index, legal enforcement and investor protection

Country	Legal origins	Absence index	Divergence index	Legal enforcement	Investor protection
Austria	German	34	36	1.87	4
Belgium	French	22	32	1.30	2
Denmark	Scandinavian	31	21	2.14	4
Finland	Scandinavian	22	31	2.12	4
France	French	21	34	1.41	5
Germany	German	18	38	1.70	4
Greece	French	40	28	0.53	3
Ireland	Common	0	34	1.68	4
Italy	French	27	37	0.32	2
Netherland	French	10	25	1.89	4
Portugal	French	29	22	1.04	3
Spain	French	28	29	1.09	5
Sweden	Scandinavian	10	26	1.99	4
U.K.	Common	0	35	1.67	4

Table 3: A summary of our findings

Countries	I index		II index		III index		IV index	
	2000-2003	2006-2009	2000-2003	2006-2009	2000-2003	2006-2009	2000-2003	2006-2009
Austria	1.79	1.91	-0.27	-0.11	0.79	0.61	1.2	0.3
Belgium	1.16	1.33	-0.11	-0.37	0.73	0.58	6.0	4.0
Denmark	1.65	1.24	-0.30	-0.30	0.79	0.67	2.2	2.1
Finland	1.20	1.30	-0.19	-0.16	0.70	0.73	2.2	3.0
France	1.38	1.47	-0.27	-0.24	0.83	0.69	3.8	2.7
Germany	1.71	1.13	-0.30	-0.55	0.81	0.55	2.3	3.0
Greece	1.47	1.50	-0.38	-0.37	0.99	1.15	3.6	2.7
Ireland	1.08	1.71	-0.38	-0.40	0.48	0.59	1.3	4.0
Italy	0.96	1.11	-0.47	-0.45	0.83	0.87	2.3	4.1
Netherland	1.25	1.53	-0.36	-0.12	0.61	0.63	2.5	16.0
Portugal	1.71	2.45	-0.03	-0.24	0.76	0.93	1.4	6.0
Spain	4.28	1.52	-0.9	-0.19	0.46	0.72	15.0	2.8
Sweden	1.19	1.23	-0.23	-0.25	0.76	0.53	1.5	1
U.K.	1.07	1.20	-0.26	-0.34	0.74	0.75	1.5	3.0

Table 4: The aggregate score

Countries	c1	Std ΔIndex1	c2	Std ΔIndex2	c3	Std ΔIndex3	c4	Std ΔIndex4	AS_i
Austria	-0.5	-0.07	0.289	-0.90	0.083	-0.98	0.473	-0.27	0.434
Belgium	-0.5	-0.45	0.289	0.69	0.083	-0.79	0.473	-0.48	-0.13
Denmark	-0.5	1.09	0.289	-0.16	0.083	-0.60	0.473	-0.12	0.71
Finland	-0.5	-0.23	0.289	-0.32	0.083	0.26	0.473	0.04	-0.06
France	-0.5	-0.12	0.289	-0.23	0.083	-0.74	0.473	-0.31	0.215
Germany	-0.5	1.59	0.289	0.04	0.083	-1.48	0.473	0.02	0.913
Greece	-0.5	0.03	0.289	-0.17	0.083	1.16	0.473	-0.27	0.101
Ireland	-0.5	-1.60	0.289	-0.14	0.083	0.76	0.473	0.40	-1.02
Italy	-0.5	-0.60	0.289	-0.18	0.083	0.370	0.473	0.232	-0.39
Netherland	-0.5	-0.63	0.289	-0.89	0.083	0.248	0.473	2.429	-1.23
Portugal	-0.5	-0.76	0.289	3.181	0.083	1.176	0.473	0.758	-1.76
Spain	-0.5	2.212	0.289	-0.70	0.083	1.705	0.473	-2.39	2.322
Sweden	-0.5	-0.03	0.289	-0.12	0.083	-1.31	0.473	-0.19	0.223
U.K.	-0.5	-0.40	0.289	-0.05	0.083	0.225	0.473	0.176	-0.29

Table 5: The countries ranked according to the aggregate score

Spain	2.322
Germany	0.913
Denmark	0.715
Austria	0.434
Sweden	0.223
France	0.215
Greece	0.101
Finland	-0.066
Belgium	-0.139
U.K.	-0.293
Italy	-0.397
Ireland	-1.026
Netherland	-1.233
Portugal	-1.769

Table 6: The OLS regression

AS_i = Cons. + αAI_i + βDI_i + γLE_i			Number of obs =	14
			R-squared	0.25
AS_i	*Coef.*	*Robust Std. Err.*	*t*	*P>|t|*
Cons.	-3.71	2.44	-1.52	0.158
α	0.04	0.02	2.50	0.031
β	0.06	0.05	1.20	0.258
γ	0.60	0.46	1.28	0.230

Table 7: The properties of our instruments

	AI_i	DI_i	LE_i
IV_i	-0.24	-0.04	0.54**
$DLegal_1$	-0.73***	0.30	0.15
$DLegal_2$	0.38	-0.19	-0.73***
$DLegal_3$	0.18	0.49	0.23
$DLegal_4$	0.01	-0.45	0.57**
F-Statistic (first stage)	17.41	5.44	21.83
(*) Value statistically significant at the 10% level (**) Value statistically significant at the 5% level (***) Value statistically significant at the 1% level			

Table 8: The 2SLS regression

AS_i = Cons. + $\alpha AI'_i$ + $\beta DI'_i$ + $\gamma LE'_i$ where: AI'_i, DI'_i, and LE'_i are the instrumented variables; IV_i and $DLegal_i$ the instruments			Number of obs =	14
			R-squared	0.1135
AS_i	*Coef.*	*Robust Std. Err.*	*z*	*P>|z|*
Cons.	-2.93	2.28	-1.28	0.200
α	0.04	0.02	2.54	0.011
β	0.02	0.05	0.34	0.734
γ	1.01	0.40	2.50	0.012