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# Is the accounting quality after the mandatory adoption of IFRS a random walk? Evidence from Europe

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## Abstract

**Purpose** – The purpose of this paper is to provide empirical evidence regarding the classification of European countries based on accounting quality metrics. The authors investigate whether the grouping of countries based on accounting quality levels differs from other classifications based on accounting practices or country-specific factors identified in previous studies.

**Design/methodology/approach** – The authors run panel data regressions for 2,078 European listed companies using value relevance and earnings smoothing metrics. The authors also apply cluster analysis to classify the countries.

**Findings** – The results suggest that the adoption of a common set of International Financial Reporting Standards (IFRS) did not lead to a similar level of accounting quality of financial information. The authors identified three clusters of countries that are not coincident with previous classifications.

**Research limitations/implications** – The results show that the adoption of different accounting practices allowed in IFRS does not necessarily influence accounting quality.

**Practical implications** – The results suggest that the way regulators decided to incorporate IFRS into national accounting systems is one issue that may be relevant in explaining the three clusters.

**Originality/value** – The paper provides empirical evidence that supports two theoretical assertions. The first is that a classification depends entirely on the characteristics used to represent the countries being classified. The second is that the adoption of a single set of accounting standards does not determine similar accounting practices and does not lead to similar levels of accounting quality.

**Keywords** IFRS, Value relevance, Earnings smoothing, Accounting quality, Classification of accounting systems

**Paper type** Research paper

## 1. Introduction

Since 2005, when the International Accounting Standards Board regulations came into effect, around 8,000 listed companies in the European Union (EU) have prepared consolidated financial statements using the same accounting standards. More than one decade later, research has proven that the improvement in accounting quality is not similar in all countries that adopted International Financial Reporting Standards (IFRS). We know that accounting quality depends on legal and political systems (Ali and Hwang, 2000; Van Tendeloo and Vanstraelen, 2005; Landsman *et al.*, 2012), and standard-setting is a political process because standard setters are influenced by different users of accounting.

On the other hand, prior international accounting research found that adopting the same accounting standards does not determine similar accounting practices (Nobes, 2006; Kvaal and Nobes, 2010). Additionally, factors such as managers' incentives, enforcement, ownership structure, auditors, industry and other institutional, political, social and economic issues are generally related to the accounting quality of financial reporting (Cai *et al.*, 2008;



Hope, 2003; Leuz *et al.*, 2003; Burgstahler *et al.*, 2006; Manganaris *et al.*, 2016; Devalle *et al.*, 2010; Hellmann *et al.*, 2013). So, as Soderstrom and Sun (2007) did, we consider that the international classification of accounting systems provides an interesting setting to examine the economic consequences of financial reporting because there is considerable variation in accounting quality and economic efficiency between countries.

The objective of the paper is to classify European countries based on the level of quality of financial information, measured by value relevance and earnings smoothing, for a period with a single set of accounting standards (IFRS). Results show that the composition of the clusters based on accounting quality differs from clusters composition found in previous studies. Since classification depends on the chosen characteristics (Nobes and Stadler, 2013), we identify several factors that may explain the composition of the clusters of countries found. We also find that the adoption of different practices, resulting from the application of different options allowed in the IFRS, does not necessarily affect the accounting quality of financial information.

Our study contributes to the cross-country literature on IFRS adoption as it links two different strands of literature. The first analyzes the accounting quality of financial information following mandatory adoption of IFRS, and the second investigates the factors that influence the classification of accounting systems.

The structure of the paper is as follows. Section 2 reviews the relevant literature and identifies the research question, while Section 3 describes the methodology and sample. Section 4 presents the empirical results. Finally, Section 5 summarizes and concludes.

## 2. Literature review and research question

### 2.1 *Adoption of IFRS and accounting quality*

Several studies document an increase in accounting quality related to the adoption of IFRS (Barth *et al.*, 2008; Cai *et al.*, 2008; Aharony *et al.*, 2010; Beuselinck *et al.*, 2010; Agostino *et al.*, 2011; Houqe *et al.*, 2012; Landsman *et al.*, 2012 and Beneish *et al.*, 2015). However, other studies find that the adoption of IFRS did not necessarily increase the quality of financial information, or the results are mixed (Van Tendeloo and Vanstraelen, 2005; Soderstrom and Sun, 2007; Aussenegg *et al.*, 2008; Christensen *et al.*, 2008; Paananen, 2008; Paananen and Lin, 2009; Chen *et al.*, 2010; Devalle *et al.*, 2010; Kabir *et al.*, 2010; Ahmed *et al.*, 2013; Liu and Sun, 2013; Doukakis, 2014).

Previous research shows that a country's financial and legal systems (Ali and Hwang, 2000; Van Tendeloo and Vanstraelen, 2005), enforcement mechanisms (Cai *et al.*, 2008; Hope, 2003; Leuz *et al.*, 2003; Burgstahler *et al.*, 2006; Manganaris *et al.*, 2016), ownership concentration, differences between local standards and IFRS (Callao *et al.*, 2006; Devalle *et al.*, 2010; Hellmann *et al.*, 2013), and other country-specific factors may affect the quality of financial information. Van Tendeloo and Vanstraelen (2005) conclude that the adoption of IFRS is not enough to provide high-quality information in code law countries, such as Germany. Legal enforcement, which is higher in common law countries (La Porta *et al.*, 1998), also plays an important role in earnings management. Cai *et al.* (2008) find that lower-quality local accounting standards, i.e. countries with local accounting standards more divergent from IFRS, benefit more from IFRS adoption (lower level of earnings management). However, Hope (2003), Leuz *et al.* (2003) and Burgstahler *et al.* (2006) consider that for countries where enforcement mechanisms are inadequate, even high-quality accounting standards are not effective. Therefore, it is not clear that the adoption of IFRS provides effective, higher quality financial information in countries that lack the necessary institutional background to support effective application and enforcement of uniform accounting standards (Wysocki, 2011). Soderstrom and Sun (2007) identify determinants of accounting quality, which include, among others: accounting standards, legal and political

systems and the incentives of financial reporting that may come from the financial market, capital structure, ownership and tax system.

We can conclude that there is no consensus about the real effect on accounting quality with IFRS mandatory adoption since previous studies report mixed findings. Therefore, we expect that the adoption of a single set of reporting standards will not be sufficient to obtain convergence in accounting quality of financial information across European countries.

### *2.2 Influence of local factors on accounting quality under IFRS*

Concerning the influence of local factors on the quality of financial information under IFRS, Nobes (1998) presented a classification of accounting systems that identified two groups of countries: Anglo-Saxon and Continental European countries. Since then, many authors (Callao *et al.*, 2006; Carmona and Trombetta, 2008; Leuz, 2010) have developed research considering this classification as a starting point and, in general, their results support this classification. Therefore, extensive empirical literature investigates why and how accounting practices vary between countries and identifies several classifications of accounting systems that are based on factors influencing the development of accounting (extrinsic classifications) or financial reporting practices (intrinsic classifications).

Previous studies find many country factors that contribute to the different accounting system classifications, including the legal system, corporate financing system and the relationship between tax and financial reporting. Other studies (Ball, 2006; Nobes, 2006; Ding *et al.*, 2007; Chua and Taylor, 2008; Carmona and Trombetta, 2008; Kvaal and Nobes, 2010; Stecher and Suijs, 2012; Standler and Nobes, 2014) suggest that countries' institutional factors remain relevant under IFRS and determine international differences in accounting policy choice. Jeanjean and Stolowy (2008) examine if earnings have been managed to avoid losses after the adoption of IFRS in three countries: Australia, France and the UK. The results confirm that the mandatory adoption of IFRS is not in itself enough to develop international comparability and create a common business language since national institutional factors limit financial reporting and determine the persistence of differences in accounting practices between countries. Leuz (2010) points out that institutional dimensions, such as legal and enforcement systems, investor protection and securities regulation, are obstacles to the convergence of reporting practices. Previous convergence of these institutional dimensions is necessary between different countries. Cole *et al.* (2011) analyze factors that determine the choice between different options provided for in IFRS made by European listed companies and confirm that different accounting solutions negatively affect the comparability of European IFRS financial statements. Additionally, Nobes (2011 and 2013) demonstrates that differences in IFRS statements continue and that the old classification of accounting systems persists despite the mandatory adoption of IFRS by EU countries. Furthermore, Kvaal and Nobes (2012) study the choices made in 2008–2009 IFRS financial statements by large listed companies from five countries. They also concluded that national patterns of IFRS practice persist after the adoption of IFRS, so international comparability remains in doubt. Nobes (2006, 2013) identifies eight topics that justify the differences in IFRS financial reporting and considers that divergences in financing, law and tax systems could still drive international differences in accounting practices under IFRS. The author concludes that despite IFRS statements now being more comparable, differences in accounting practices are likely to remain. Hellmann *et al.* (2013) investigate if three international accounting classification systems, equity financing, law and culture (Gray, 1988; Nobes, 1998, 2008) are still effective after mandatory adoption of IFRS (transition date). They find that traditional international accounting system differences still existed after mandatory adoption of IFRS. Nobes and Stadler (2013) examine how the classifiers themselves and the characteristics they choose can affect classification. They also

assess the reliability of previous accounting classifications with an empirical analysis of the sensitivity of the variation in some factors, such as country and sector. They find the existence of a strong relationship with sector and IFRS policy choice and deduce that classifications of accounting systems are full of difficulties and judgments that need to be disclosed when we make a classification analysis. The authors show that different researchers produce different classifications; any classification of accounting systems depends entirely on the characteristics chosen to represent the countries being classified.

More recently, Forst (2014) investigates IFRS implementation choices under IAS regulation (extending IFRS adoption to consolidated accounts of non-listed companies and/or to annual accounts of listed and non-listed companies) and, based on cluster analysis, identifies three different clusters of countries. First is the antagonistic group, which includes countries that did not expand the use of IFRS much beyond the scope of the IFRS regulation (including Austria, Belgium, France, Germany, Hungary, Poland, Portugal, Romania, Spain, Sweden). Second is the integrated group that includes countries (including Bulgaria, Cyprus, Estonia, Greece, Italy, Latvia, Lithuania, Malta, Slovakia) that have expanded the use of IFRS beyond the limited mandate of the IFRS Regulation. Third is the leaning group that includes countries influenced by Anglo-American accounting practice (includes Czech Republic, Denmark, Finland, Iceland, Ireland, Liechtenstein, Luxembourg, the Netherlands, Norway, Slovenia, UK). Forst (2014) concludes that traditional accounting system classifications remain important and similar in the post-IFRS era (Nobes, 2008; Leuz, 2010).

Nevertheless, we can expect that if companies adopt uniform, high-quality accounting standards, even if they choose different accounting practices, they will prepare and disclose high-quality financial information. Thus, we should not expect different accounting practices to affect, or be related to, the level of accounting quality. Despite IFRS containing some alternative accounting treatments, they all should be of high quality.

The objective of the paper is to classify European countries based on the level of quality of financial information found for each one. Considering that the classification of countries depends on the characteristic analyzed (Nobes and Stadler, 2013), we expect the classification of countries based on accounting quality to be different from earlier accounting system classifications. Thus, our research question is:

*RQ1.* How are European countries classified based on accounting quality, measured by value relevance and earnings smoothing, and which national factors explain this classification?

### 3. Research design and sample

#### 3.1 Research design

Previous studies show that value relevance and earnings smoothing are adequate measures of accounting quality (Barth *et al.*, 2008, 2012; Chen *et al.*, 2010; Van Tendeloo and Vanstraelen, 2005; Cai *et al.*, 2008; Paananen and Lin, 2009; Agostino *et al.*, 2011). Consequently, we used those two accounting quality measures that were frequently used in previous studies.

*Value relevance.* We use regression analysis to obtain our value relevance metrics. More specifically, we measure the explanatory power of regressions of stock price and stock returns on particular accounting amounts and industry indicator variables. Similar to Barth *et al.* (2012), we construct each metric as the difference in the explanatory power of the full model and the nested model that includes only an industry indicator variable. The main motivation for this approach is to mitigate differences in mean stock prices and stock returns across industries that would affect our value relevance metrics. In this way, each metric will reflect only the explanatory power of the relevant accounting amounts for the dependent variable.

Our first value relevance metric (VR1) is based on the explanatory power of a regression of share price,  $P$ , on net income before extraordinary items per share, NI, and book value of equity per share, BVE. In particular, our first value relevance metric is the difference between the adjusted  $R^2$  from Equation (1) and the adjusted  $R^2$  from the nested version of Equation (1), which includes only  $I$ :

$$P_{it} = \beta_0 + \beta_1 BVE_{it} + \beta_2 NI_{it} + \sum_j \beta_3 I_j + \varepsilon_{it}, \quad (1)$$

where  $I_j$  is the indicator dummy variable that defines the industry,  $i$  and  $t$  refers to company and year, respectively.

A second measure of value relevance is commonly used in the literature to test the robustness of the results obtained using the price regression model. This second relevance metric (VR2) is based on the adjusted  $R^2$  from a regression of annual stock return, *Return*, on net income and change in net income, deflated by the beginning of the year price,  $NI_t/P_{t-1}$  and  $\Delta NI_t/P_{t-1}$ . In particular, our second value relevance metric is the difference between the adjusted  $R^2$  from Equation (2) and the adjusted  $R^2$  from the nested version of Equation (2), which includes only I:

$$\begin{aligned} RETURN_{it} = & \beta_0 + \beta_1 \frac{NI_{it}}{P_{it-1}} + \beta_2 \frac{\Delta NI_{it}}{P_{it-1}} \\ & + \beta_3 LOSS_{it} + \beta_4 LOSS_{it} \times \frac{NI_{it}}{P_{it-1}} + \beta_5 LOSS_{it} \times \frac{\Delta NI_{it}}{P_{it-1}} \\ & + \sum_j \beta_6 I_j + \varepsilon_{it}. \end{aligned} \quad (2)$$

In equation (2), *Return* is the cumulative percentage change in stock price beginning nine months before the fiscal year end and ending three months after the fiscal year end, adjusted for dividends and stock splits. Following Hayn (1995) and Barth *et al.* (2012), the coefficients  $NI_t/P_{t-1}$  and  $\Delta NI_t/P_{t-1}$  may differ for loss firms by using the dummy indicator LOSS, which equals one if  $NI_t/P_{t-1} < 0$  and zero otherwise.

*Earnings smoothing.* We use two measures of earnings smoothing. The first earnings smoothing metric (ES1) is the ratio of the variance of the change in net income to the variance of the change in cash flow,  $\text{var}(\Delta NI^*)/\text{var}(\Delta CF^*)$ , where  $\text{var}(\Delta NI^*)$  is the variance of residuals from the regression:

$$\frac{\Delta NI_t}{TA_{t-1}} = \beta_0 + \sum_j \beta_1 I_j + \varepsilon_{it}, \quad (3)$$

and,  $\text{var}(\Delta CF^*)$  is the variance of residuals from the regression:

$$\frac{\Delta CF_t}{TA_{t-1}} = \beta_0 + \sum_j \beta_1 I_j + \varepsilon_{it}, \quad (4)$$

The second earnings smoothing metric (ES2) is the correlation between accruals ( $ACC^*$ ) and cash flow ( $CF^*$ ). In a similar way,  $ACC^*$  is the residual from the regressions:

$$\frac{ACC_t}{TA_{t-1}} = \beta_0 + \sum_j \beta_1 I_j + \varepsilon_{it}, \quad (5)$$

$$\frac{CF_t}{TA_{t-1}} = \beta_0 + \sum_j \beta_{1j} I_j + \varepsilon_{it}. \quad (6)$$

According to some authors (Land and Lang, 2002; Myers *et al.*, 2007; Barth *et al.*, 2012), we interpret a higher ratio of variances and a less negative correlation as evidence of less earnings smoothing.

Achievement of the accrual quality metric is based on Barth *et al.* (2012), and is the standard deviation of residuals from the regression of ACC\* in the previous year, current year and subsequent year's operating cash flow (each deflated by its lagged total assets):

$$ACC_{it}^* = \beta_0 + \beta_1 CF_{it-1} + \beta_2 CF_{it} + \beta_3 CF_{it+1} + \varepsilon_{it}. \quad (7)$$

According to the literature review, a lower standard deviation of residuals from Equation (7) is seen as evidence of higher accrual quality.

Regarding estimation procedures, we use panel data models. In all the equations that do not include dummy variables, we apply the Hausman test to select the most appropriate model. In these, the random effects model was usually found to be the most suitable. The equations that include dummy variables are estimated by the random effects method.

To answer our research question and classify countries based on the accounting quality metrics, we use multivariate analysis. More specifically, we start with cluster analysis. Given the number of observations, we use the hierarchical method. Validation of results was performed by comparing the results of different cluster methods: between groups linkage and Ward's method, all based on the squared Euclidean distance for all variables. With this approach, we intend to obtain information about the homogeneity (and heterogeneity) of countries regarding the respective metrics under valuation.

After obtaining homogeneous groups using cluster analysis, it is important to clarify which variables discriminate each group statistically. We use linear discriminant analysis (LDA). This approach can determine which variables discriminate significantly between two or more groups of objects. It is applicable when there is only one dependent variable but multiple independent variables (similar to ANOVA and regression). However, unlike ANOVA and regression analysis, the dependent variable must be categorical. If the groups are not homogeneous in terms of dimension, there may be some problems in terms of heterogeneity of the variance/covariance matrices. In this case, we can complement the analysis using multinomial models.

Even so, if the correlations between means and variances across groups are statistically null, and the data represent a sample from a multivariate normal distribution, it may be assumed that the main assumptions of LDA are verified (Friedman, 1989; McLachlan, 2004).

### 3.2 Sample and data

Our sample consists of 2,078 European listed companies, financial and non-financial, from Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the UK, for which Worldscope Database data were available for all the variables (accounting standards, stock price, book value of equity per share, net income per share, industry, total assets and cash flow from operations) for the period between 2005 and 2010 (Table I).

A first filter was applied, and observations from companies that followed US GAAP and with negative book value of equity were excluded. We also excluded a very small number of



**Table I.**  
Companies included  
in the sample

Country	Number of company year observations	Missing information	Local standards	Negative BVEPS	Number of company year observations	%
Austria	209	140	9	3	57	2.74
Belgium	319	217	134	5	78	3.75
Denmark	469	280	96	5	88	4.23
Finland	241	124	7	6	104	5.00
France	1,770	1,141	273	14	342	16.46
Germany	1,654	1,129	148	21	356	17.13
Greece	445	204	15	16	210	10.11
Ireland	165	121	5	3	39	1.88
Italy	564	356	25	7	176	8.47
The Netherlands	430	306	29	2	93	4.48
Portugal	150	108	4	4	34	1.64
Spain	236	140	11	2	85	4.09
Sweden	485	259	81	4	141	6.79
UK	4,967	3,655	1,021	16	275	13.23
Total	12.104	8.180	1.858	108	2.078	100

observations that present some typing errors from Worldscope Database. Similar to other authors (Daske *et al.*, 2008; Barth *et al.*, 2012), we identified some classification errors in this database that imposed small reductions in the sample, on specific metrics, although this reduction was not significant concerning the respective weight.

Since we intend to classify European countries based on the accounting quality, after mandatory adoption of IFRS, we used data from companies in 14 EU countries for the years 2005 to 2010.

Table I shows descriptive statistics for sample companies in terms of country representation. The greatest representation is from Germany (17.13 percent), France (16.46 percent) and the UK (13.23 percent).

#### 4. Results

Descriptive statistics of accounting quality metrics are summarized in Table II.

Table II shows that, on average, the levels of studied variables vary between countries. On average, Belgian and French companies tend to present higher values of book value of equity per share (81,449 and 66,639, respectively) while Irish and Portuguese companies tend to show the lowest values (2,868 and 2,813, respectively). Companies from Greece and Portugal also present, on average, the lowest value of net income per share (0.232 and 0.289, respectively). In terms of return, Dutch companies show, on average, the highest returns (0.526), and Greek companies show the lowest returns (0.067).

To achieve our objective, we start with several measures as proxies for accounting quality. We determined the effect on the accounting quality of financial information of the mandatory application of a single set of accounting standards (IFRS). We expect the accounting quality of financial information to vary across European countries. The results are shown in Table III.

Table III shows that the value relevance of financial information varies between countries after mandatory adoption of IAS/IFRS. On the one hand, the value relevance of financial information, based on price specification, is higher for Denmark (0.9110) and France (0.7804) and lower for Belgium (0.1699), Finland (0.4715) Portugal (0.4858) and Italy (0.4972). On the other hand, the value relevance of financial information, based on returns specification, is higher in Sweden (0.1959) and the UK (0.1822) and lower in Austria (−0.0011) and France (−0.0014). These results are, to some extent, consistent with earlier studies. For example, Bogstrand and Larsson (2012) find a significant increase in value relevance in both

Countries	<i>P</i>		BVE		NI		Return		CF	
	<i>n</i>	Mean	<i>n</i>	Mean	<i>n</i>	Mean	<i>n</i>	Mean	<i>n</i>	Mean
Austria	342	36.194	342	36.093	342	0.739	285	0.268	228	0.057
Belgium	468	68.355	468	81.449	468	2.839	390	0.100	312	0.072
Denmark	507	50.819	509	32.827	502	0.162	431	0.148	344	0.029
Finland	624	9.372	624	4.900	624	1.431	518	0.123	416	0.094
France	2009	76.825	2,040	66.639	2,038	2.172	1,676	0.124	1,367	0.060
Germany	2,130	33.186	2,130	18.774	2,130	0.764	1,778	0.159	1,423	0.067
Greece	1,254	4.818	1,254	3.763	1,242	0.232	1,041	0.067	837	0.034
Ireland	216	5.768	216	2.868	216	3.248	180	0.088	144	0.060
Italy	1,056	8.266	1,056	5.884	1,056	0.408	880	0.129	704	0.036
The Netherlands	551	19.667	551	11.691	551	13.071	455	0.526	369	0.081
Portugal	204	4.819	204	2.813	204	0.289	170	0.273	136	0.054
Spain	560	16.133	566	8.045	566	1.767	473	0.109	384	0.046
Sweden	846	23.531	846	12.949	846	3.960	705	0.143	564	0.060
UK	1,650	4.822	1,650	2.753	1,650	10.984	1,375	0.	1,100	0.053

**Notes:** *P* is the share price three months after the fiscal year end; BVE is the book value of equity per share; NI is net income before extraordinary items per share; Return is the cumulative percentage change in stock price beginning nine months before fiscal year end and ending three months after fiscal year end, adjusted for dividends and stock splits; CF is the operating cash flows deflated by total assets

**Table II.**  
Descriptive statistics  
of variables

Countries	VR1	VR2	ES1	ES2
Austria	0.6081	-0.0011	1.9074	-0.1260
Belgium	0.1699	0.0127	2.6075	-0.0298
Denmark	0.9110	0.0509	1.7193	-0.0502
Finland	0.4715	0.1376	0.2793	-0.0075
France	0.7804	-0.0014	3.0874	-0.0048
Germany	0.7092	0.0276	1.2782	-0.0327
Greece	0.6099	0.0299	0.0368	-0.0609
Ireland	0.6663	0.0075	1.2693	0.0303
Italy	0.4972	0.0240	1.1000	-0.1339
The Netherlands	0.6540	0.0172	0.9479	0.0015
Portugal	0.4858	0.0445	0.2446	-0.0759
Spain	0.7335	0.1024	1.1551	-0.0638
Sweden	0.5536	0.1959	4.4627	-0.0022
UK	0.6374	0.1822	1.4627	0.0054

**Notes:** The first value relevance metric (VR1) is the difference between the adjusted  $R^2$  from a regression of stock price on book value of equity per share and net income per share and the adjusted  $R^2$  from the nested version of the same regression that includes only industry; the second value relevance metric (VR2) is the difference between the adjusted  $R^2$  from a regression of annual stock returns on net income and change in net income deflated by beginning of year price and the adjusted  $R^2$  from the nested version of the same equation that includes only industry; the first earnings smoothing metric (ES1) is the ratio of the variance of the change in net income to the variance of the change in cash flow (Equation 3). The second earnings smoothing metric (ES2) is the correlation between accruals and cash flows

**Table III.**  
Accounting quality  
metrics estimates

Scandinavian earnings information and book values; Devalle *et al.*, 2010 also find that for France, the value relevance of earnings has increased. However, for Italy and the UK, IFRS has not improved the relationship between share price and accounting measures. Christensen *et al.* (2008) find no accounting quality improvements for firms that mandatorily adopted IFRS in 2005. Those results also show that, despite all companies adopting the same accounting standards (IAS/IFRS), the value relevance of financial information is different across the 14 countries included in the sample.

We also present, in Table III, the results of estimating accounting quality through earnings smoothing. Our first earnings smoothing measure shows the variance of the change in net income to the variance of the change in cash flow. A smaller variance of change in net income can be evidence of earnings smoothing. Companies in Greece (0.0368) and Portugal (0.2446) show less variance of change in net income to variance of change in cash flow, which indicates that those companies tend to smooth earnings. On the contrary, companies in Sweden (4.4627), and France (3.0874) show higher values, indicating less earnings smoothing.

The second earnings smoothing measure shows the correlation between accruals and cash flows; a more negative correlation between accruals and cash flows is generally associated with less earnings smoothing (Lang *et al.*, 2003; Leuz *et al.*, 2003; Lang *et al.*, 2006; Barth *et al.*, 2008). Italian (-0.1339) and Austrian (-0.1260) companies show a more negative correlation, but we also find a positive correlation between accruals and cash flows in Ireland (0.0303), the UK (0.0054), and the Netherlands (0.0015). These results are consistent with the findings of Cai *et al.* (2008) suggesting that levels of earnings management still vary across countries, after mandatory adoption in 2005. They show that Australia, Sweden and South Africa have the lowest earnings management, while Portugal, the Philippines and Italy have the highest.

Our results may question the suitability of the metrics used to measure accounting quality. In fact, both measures of value relevance and earnings smoothing were expected to lead to similar results. Although the metrics tend to measure accounting quality, the results

show differences between them. Overall, our results suggest that the adoption of a common set of accounting standards did not lead to a similar level of accounting quality (value relevance and earnings smoothing) of financial information across European countries, as expected.

Based on the value relevance and earnings management metrics, for the 14 European countries, we identify groups of countries with similar levels of accounting quality. To answer our research question, we perform a cluster analysis. Given the small number of observations (14 countries and four metrics), we used the hierarchical method and Ward's criterion. We should note that cluster analysis is not an inferential procedure since there are no tests to evaluate the validity of results. To validate the results obtained, we make our analysis using different distance measures and criteria (namely Between Linkage criterion). The Dendrogram reflecting the classification of countries according to our two metrics (value relevance and earnings smoothing) is reproduced in Figure 1.

To understand which variables are effectively important to distinguish between groups, we perform a discriminant analysis[1]. According to the Wilk's test results, only ES1 and VR1 are statistically significant discriminant metrics. This means that using only these two variables, we would be able to distinguish between the three groups obtained. We found two discriminant functions defined by:

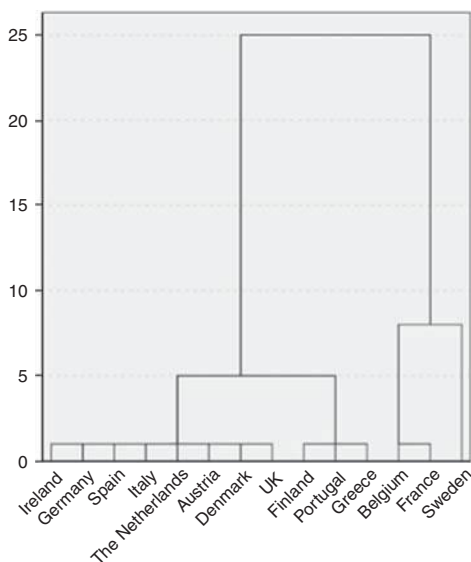
$$Z_1 = -8.053 + 9.820VR1 + 1.386 ES1$$

$$Z_2 = -3.857 + 8.193VR1 - 0.608 ES1. \quad (8)$$

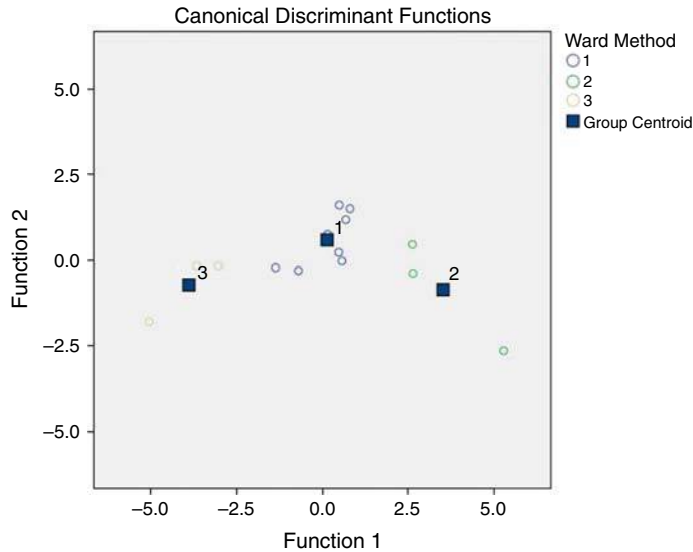
According to the tests performed using those functions, we obtained 92.9 percent of cases correctly classified, which validates the results under analysis.

In Figure 2, we can see that the centroids of each group are statistically different from each other. This means that the groups are heterogeneous, which is an excellent indicator of the quality of the cluster and discriminant analysis.

As shown in the results, classification of the countries included in our sample, based on the level of accounting quality, measured by value relevance and earnings management, is



**Figure 1.**  
Groups of countries



**Figure 2.** Distribution of the groups according to the discriminant functions obtained

different from previous classifications of accounting systems based on accounting practices and countries' specific factors.

In Table IV, we summarize our results in those three different clusters.

Based on previous literature, we identify some reasons that justify the clusters.

The first is the way regulators decided to incorporate IFRS into national accounting systems, in particular, in terms of standalone/separate financial statements and consolidated financial statements (Nobes, 2014). The European regulation requires the adoption of IFRS in consolidated financial statements of listed companies but allows countries to require or permit the adoption of IFRS in standalone/separate financial statements of listed companies and consolidated and standalone/separate financial statements of non-listed companies.

Therefore, the first cluster (Belgium, France and Sweden) includes countries that do not permit the adoption of IFRS for standalone/separate financial statements and whose domestic standards do not converge with IFRS (PriceWaterhouseCoopers, 2015). The second cluster (Finland, Portugal and Greece) includes countries that permit the adoption of IFRS for standalone/separate financial statements and whose domestic standards have been converging with IFRS.

On the other hand, our third cluster (Ireland, Germany, Spain, Italy, the Netherlands, Austria, Denmark and the UK) can be explained by other factors that justified previous classifications. The first factor is the proximity of domestic standards to the IFRS, such as Ireland and UK. The second factor is the voluntary adoption of IFRS before 2005, in Germany, Italy and Austria (Soderstrom and Sun, 2007; Van Tendeloo and Vanstraelen, 2005), countries that usually appear, in other classifications, but in the same group as Ireland and the UK.

**Table IV.** Cluster membership of European Union countries included in the sample

	Cluster 1	Cluster 2	Cluster 3
Countries	Belgium, France and Sweden	Finland, Portugal and Greece	Ireland, Germany, Spain, Italy, the Netherlands, Austria, Denmark and the UK

The third reason is the strength of the equity markets, which can be used to justify the proximity between countries such as Denmark and the Netherlands with the others, in this third cluster, and which is a common feature with the Anglo-Saxon countries (Nobes, 2008). The fourth is the early convergence of domestic standards with IFRS, which can explain the Spanish presence in this cluster, since it converged in 2008, before Portugal, for example. The fifth reason is the enforcement system, which can explain the Austrian presence in this cluster, given that it is a country classified by Leuz (2010) as having strong legal enforcement. Finally, the fact that national accounting standards are not required in non-consolidated financial statements is the sixth reason and justifies the Italian presence in this cluster since companies tend to use IFRS in those statements.

In summary, we can explain the inclusion of a country in a cluster based on a specific characteristic. However, this specific characteristic, by itself, cannot justify the whole composition of the cluster.

In Table V, we compare our results with other previous studies, finding some similarities between our clusters and the others. Forst (2014) classified countries into three groups. The first, the antagonistic group includes countries that tend to make implementation choices in the direction of not allowing IFRS. Second, the integrated group contains countries that tend to make implementation choices in the direction of requiring IFRS. Third, the leaning group includes UK-influenced and Scandinavian countries. The countries included in our Cluster 1 are also considered by Forst (2014) as belonging to the antagonistic group. Concerning the other two clusters, we cannot find a relation between our results and those of Forst (2014).

When we compare our results with the Leuz (2010) classification based on the importance of the stock market and the quality of legal enforcement, we can conclude that countries included in our Cluster 1 are classified in the insider/strong category. In Leuz's analysis, countries in the outsider/strong category (Ireland and the UK) belong to our Cluster 3. Countries classified as insider economies with strong legal enforcement are split between Clusters 2 and 3, and insider economies with weak legal enforcement are also split between Clusters 2 and 3.

Finally, comparing our results with the Nobes (2008) classification, we can see that strong equity countries are all included in our Cluster 3; weak equity countries are split between our Clusters 1, 2 and 3, which makes it more difficult to compare and understand

	Cluster 1	Cluster 2	Cluster 3
Our results	Belgium, France and Sweden	Finland, Portugal and Greece	Austria, Denmark, Germany, Ireland, Italy, the Netherlands, Spain and the UK
<i>Forst (2014)</i>			
Antagonistic group	Belgium, France and Sweden	Portugal	Austria, Germany and Spain
Leaning group		Finland	Denmark, Ireland, the Netherlands and UK
Integrated group		Greece	Italy
<i>Leuz (2010)</i>			
Outsider/strong			Ireland and UK
Insider/strong	Belgium, France and Sweden	Finland,	Austria, Denmark, Germany, the Netherlands and Spain
Insider/weak		Portugal and Greece	Italy
<i>Nobes (2008)</i>			
Strong equity/ commercially driven			Denmark, Ireland, the Netherland and UK
Weak equity	Belgium, France and Sweden	Finland, Portugal and Greece	Austria, Germany, Italy and Spain

**Table V.**  
Comparison with the  
results of some  
previous research

our results. In short, our results show that there are differences in the level of quality of financial information among European countries, and several factors may explain these differences. However, we could not find, in the literature review, a single reason that justifies our classification. On the contrary, we can explain our results by different factors. In this way, the quality of financial information, despite the adoption of IFRS, has a random walk.

## 5. Conclusions

Following mandatory IFRS adoption in Europe, this paper investigates the influence of accounting quality on the classification of accounting systems. Overall, our results suggest that the adoption of a common set of accounting standards did not lead to a similar level of accounting quality (value relevance and earnings smoothing) of financial information across 14 European countries. Our results are consistent with some previous studies (Van Tendeloo and Vanstraelen, 2005; Paananen, 2008; Paananen and Lin, 2009; Chen *et al.*, 2010; Liu and Sun, 2013) that used similar methodologies and/or samples.

As the quality of financial information is not to be influenced by the accounting standards set or by the choices of different accounting practices made by companies, we come to the following research question:

*RQ1.* How are European countries classified based on accounting quality, measured by value relevance and earnings management, and which national factors explain this classification?

To answer this question, we verified whether the grouping of countries based on accounting quality levels differs from the clusters of countries based on accounting practices or country-specific factors identified in prior studies.

We found three different clusters of countries that present a similar pattern of accounting quality concerning value relevance of financial information and earnings smoothing. However, the clusters of countries we obtained are not similar to previous classifications. Thus, we cannot conclude that differences between countries in terms of accounting quality after mandatory adoption of IFRS are affected by or related to country-specific factors or accounting practices identified previously. Finally, we provide empirical evidence that proves, as Nobes and Stadler (2013) found, that classification depends on the characteristics chosen to represent the countries being classified.

This paper has continued research in the area of IFRS adoption, contributing to previous research in two ways. First, the paper shows that a classification depends entirely on the characteristics used to represent the countries being classified. Second, the paper provides evidence that the adoption of a single set of accounting standards does not lead to similar levels of accounting quality.

Our results are relevant for standard setters, international regulators involved in the accounting harmonization process and academics. For standard setters and international regulators, we provide evidence that different accounting practices do not affect the quality of accounting information and, consequently, this may question the relevance of reducing the number of alternative treatments in IFRS. For academics, we propose a different classification for countries, and we compare our results with other classifications presented in the literature.

We contribute to the literature with the identification of countries' characteristics that may justify our results, namely, the way countries adopted IFRS, particularly, the degree to which national regulators allow or require IFRS for different purposes. Additionally, the implications for research, practice and accounting regulators is a better understanding of which countries are similar concerning the quality of accounting information, something not previously studied, as far as we know.

One of the limitations of our research is the metrics adopted for accounting quality analysis. If we selected other variables, it is possible that we would obtain different results and a different classification of countries, more like earlier classifications. Another limitation is our sample. In future research, we can study more countries, both European and non-European. Finally, at least for some countries, changes in accounting quality might be affected by the economic environment, particularly the financial crisis of 2008–2010.

#### Note

1. To validate the results of the discriminant analysis, we verify the main patterns of this technique, namely the homogeneity of group variances and multivariate normality. Both tests indicate, with 5 percent of significance, that the null is not rejected.

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