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The effects of IFRS adoption on the unconditional conservatism of Spanish listed companies*

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Abstract: This paper analyses the effects of the mandatory adoption of International Financial Reporting Standards (IFRS) by Spanish listed companies in January 2005 on unconditional conservatism. The lack of robustness in the previous results justifies analysing this issue from different perspectives to correct the methodological shortcomings that could be biasing the results. To this end, we use, for the first time in this context, Ahmed and Duellman's methodology (*J. Account. Econ.*, 2007). In its design, these authors consider the impact of growth options and other future incomes, controlling for the idiosyncratic factors that the literature has found to condition this type of conservatism. Additionally, beyond the pooled regression techniques usually used, we use econometric panel data techniques, which minimize the possible effect of endogeneity in the estimation of the proposed models. The results provide new evidence that the adoption of IFRS has had no effect on the unconditional conservatism of Spanish listed companies.

Keywords: Balance-sheet conservatism; idiosyncratic factors; mandatory adoption of International Financial Reporting Standards; panel data analysis; value of growth options.

JEL Classification: C31; C33; C52; M41.

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1. Introduction

Since January 2005, companies in the European Union listed on an official market have had to adopt the International Financial Reporting Standards (IFRS) in their consolidated financial statements. This mandate, which aimed to harmonize the Union country members' accounting systems, is perhaps the most important of the recent events seeking accounting transparency and quality for European companies. Under the hypothesis that accounting conservatism is influenced by accounting rules, this change from countries' Generally Accepted Accounting Principles (GAAP) to IFRS could have a significant impact on accounting conservatism. This fact justifies the relevance of empirical studies that analyse the effects of this normative change for practitioners, academics and policy makers.

Although the concept of conservatism plays a crucial role in the accounting literature (Basu, 1997; Watts, 2003; and Ball et al., 2013), there is no single definition of it, and depending on the author, it is related alternatively to the income statement or the balance sheet of companies. Givoly et al. (2007) cite as a generic definition of conservatism that offered by the FASB (Financial Accounting Standards Board) in the glossary of Statement of Concepts No. 2: "*conservatism is a prudent reaction to uncertainty to try to ensure that uncertainties and risks inherent in business situations are adequately considered.*" In general, two types of accounting conservatism are recognized: unconditional conservatism (Givoly et al. 2007; Watts, 2003; and Beaver and Ryan, 2005), which involves systematic and news-independent persistence to undervalue the net assets of the company (i.e., equity) through policies and methods that are conservative,¹ and conditional conservatism (Basu, 1997), which refers to the high degree of prudence required to recognize good news (i.e., gains) versus bad news (i.e., losses).²

In this paper, we focus on analysing the effect of IFRS adoption by Spanish stock market-listed companies on their unconditional conservatism. The reasons that lead us to focus on unconditional conservatism are several. First, we expect that a high level of unconditional conservatism exists prior to the adoption of IFRS in the continental accounting systems, such as those in Spain, given the significant influence that tax laws have on them. Second, the negative influence that unconditional conservatism has on the quality of accounting information makes it

¹ Among other accounting practices, unconditional conservatism includes ignoring intangible assets and R&D costs, applying accelerated depreciation on fixed assets, and overvaluing provisions systematically.

² Ball et al. (2000) refer to this definition, which is news dependent, as income conservatism versus unconditional conservatism, which is also known as balance-sheet conservatism.

a clear aspect to eradicate in comparison to the more desirable conditional conservatism, which reduces the discretion of agents to manage earnings (Dechow et al., 2010).³ Third, the empirical evidence of a trade-off between unconditional and conditional conservatism, which together with the expected high unconditional conservatism, anticipates a relatively lower level of conditional conservatism in the continental accounting systems.⁴

Nobes (1998) shows evidence that, prior to the adoption of IFRS, conservatism, both unconditional and conditional, differs between countries for cultural reasons (Cieslewicz, 2013), legal reasons, the financial system structure and other firm-level incentives.⁵ Moreover, recent evidence (Kvaal and Nobes, 2010; Martínez et al., 2011; Haller and Wehrfritz, 2013, Filip and Raffournier, 2013; and Nobes and Perramon, 2013) shows that the proper application of IFRS differs between countries depending on previous GAAP. Thus, it is expected that the changes induced by the adoption of IFRS differ between countries; thus, a correct effect measurement requires an analysis at the country level.

In the context of the analysis of the effect of IFRS adoption on the unconditional conservatism of Spanish listed companies, we find that studies using different methodologies and samples report contradictory evidence. Most of this literature shows that either there are no changes (Garrido and Vazquez, 2011; Fullana and Toscano, 2016) or there is an increase (Callao et al., 2007; and Callao et al., 2010) in the balance-sheet conservatism after the application of IFRS. However, it is necessary to deepen this analysis because unexpected (and contradictory) evidence exists in the literature. We expect that the transition from the local GAAP of a continental accounting system to IFRS would reduce, at least, overly conservative practices. Consequently, we expect a reduction in the net assets underestimation bias, achieving a fair value of the economic conditions of the company more in line with reality.

³ In this sense, note that in the accounting literature, unconditional and conditional conservatism are incorporated into empirical models with opposite effects (Beaver and Ryan, 2005; and Roychowdhury and Watts, 2007).

⁴ Ball et al. (2000), Basu et al. (2005), Giner and Rees (2001), Pope and Walker (2003), Hanna (2002), Francis et al. (2004) and Pae et al. (2005) empirically documented the negative relationship between the two types of conservatism, even, as in Givoly et al. (2007), at the industry level.

⁵ According to the indicator of Bae et al. (2008), which analyses twenty-one possible accounting differences between local accounting principles and the international accounting standards, Spain ranks second in Europe with sixteen differences between local GAAP and IFRS and is only surpassed by Greece. The mean of the differences in European countries with continental accounting systems is 11.75, whereas the average of European countries with Anglo-Saxon accounting systems is 1.00.

The contradictory previous evidence could be explained, depending on the methodology used, by the sample representativeness; transitory effects, both regulatory and managerial (García-Osma and Pope, 2011; and Kvaal and Nobes, 2012); changes in the value of the growth options included in the firm market value (Roychowdhury and Watts, 2007); changes in other factors different from accounting rules that explain unconditional conservatism (Nobes, 1998; Ball et al., 2003; and Ding et al., 2007); and model risk. In this line, the aim of this paper is to empirically analyse the effect of the adoption of IFRS on unconditional conservatism of a highly representative sample of non-financial companies listed on the Spanish stock market considering, as in Ahmed and Duellman (2007), the value of growth options that the firms' market value includes, as well as the potential explanatory factors of unconditional conservatism unrelated to the accounting rules.

To this end, a time window of data is used with amplitude that allows us to collect any regulatory and managerial transitory effects. In fact, the data sample used covers a time period of ten years, which includes five years before and five years after the implementation of IFRS by the EU mandate. In this way, we intend to confirm or refute the robustness of the results found in the previous literature and help to distinguish between controversial studies.

The remainder of this paper is organized as follows. In Section 2, we analyse the previous literature related to the effect that accounting rules have on balance sheet conservatism in general and the effect of the mandatory adoption of IFRS by Spanish listed companies in particular. In Section 3, we establish the main hypothesis, show the methodology developed in Ahmed and Duellman (2007), and adapt it to analyse the effect of the change of accounting rules in the conservatism of balance sheets. In Section 4, the data used are shown. Section 5 is devoted to showing the empirical results. To examine the bias due to a lack of specification, we show the results of alternative model specifications. In the same way, we show the results from two different estimation methodologies: that proposed in this study as the optimal and the most used in this context. Finally, in Section 6, we conclude with a summary of the main results achieved with the analysis.

2. Analysis of previous literature

2.1 The effect of accounting standards on unconditional conservatism

Watt (2003) reviewed the literature focused on measuring unconditional conservatism, establishing the different factors that cause it and analysing its impact on relations between different users of accounting information. Among this literature, we found works focused specifically on analysing the impact of accounting standards on balance-sheet conservatism. This analysis is done in the literature as a natural experiment by comparison: under the

assumption that accounting standards cause unconditional conservatism, in different countries with different standards different degrees of unconditional conservatism should be found. Similarly, in a single country, we should find different degrees of unconditional conservatism in periods with different accounting standards, either by the natural evolution of standards in the Anglo-Saxon systems or by their mandatory enforcement in the continental accounting systems.

Among the literature devoted to contemporaneously measuring differences in the balance-sheet conservatism by country, Joos and Lang (1994) stands out as pioneer. In their paper, the authors analyse unconditional conservatism using the book-to-market ratio (BtM) and the value-relevance of equity book value for different European countries: Germany and France with a continental accounting system and the United Kingdom with an Anglo-Saxon accounting system. These authors relate a BtM value of less than one with unconditional conservatism and find such a value in the period 1982-1990 for all three countries, although with greater intensity in the two countries with a continental accounting system. Thus, their findings confirm their initial hypothesis. In posterior work, Joos (1997) analyses conditional conservatism using only the value-relevance relation. He extends the time horizon to 1993 and finds similar results that corroborate the evidence shown in Joos and Lang (1994).⁶

In the same line, García and Mora (2004) analyse accounting conservatism in eight European countries including Spain. Following Givoly and Hayn (2000), the authors use as a balance-sheet conservatism proxy the country-aggregate BtM and develop an analysis of the value-relevance relation of book value of equity. Their results corroborate previous results, finding unconditional conservatism in the countries included in the sample for the period 1987-2000 and a higher incidence in those countries with a continental accounting system.

In contrast, the literature focused on testing balance-sheet conservatism differences between different time periods is mostly developed in the context of the US. These works try to capture the impact of the natural evolution of accounting standards in an Anglo-Saxon accounting system. Among others, Stober (1996) and Givoly and Hayn (2000) are the more representative. These authors use the market-to-book ratio (MtB) as a proxy of unconditional conservatism and find that for three decades this value has been greater than one. The authors relate this fact with the presence of balance sheet conservatism in the US market, but paradoxically, they observe

⁶ Zhong and Li (2016) refer to the MtB ratio as a balance-sheet conservatism measure “because it results from the understatement of net assets” and attribute its development to Feltham and Ohlson (1995; 1996) and Givoly and Hayn (2000). In their review of articles from seven top accounting journals, Zhong and Li (2016) find only one article that uses the Valuation Model to measure balance-sheet conservatism. Due to its rare use, they decline to review this measure and remit to Ahmed et al. (2000) for details.

that conditional conservatism far from decreases with the time evolution of accounting standards but rather increases over time.

Among the works that analyse the effect of changes in the legal accounting rules of a continental accounting system on unconditional conservatism, we highlight Giner and Rees's (1999) work because it focuses on the context of Spain. In this work, the authors analyse the value-relevance relation of the book value of equity and earnings, concluding that no significant changes occurred in balance-sheet conservatism when firms moved to apply by legal mandate the local GAAP of 1990.

2.2 Effect of IFRS on unconditional conservatism in Spain

When we review the previous literature focused on testing the effect of the mandatory adoption of IFRS on unconditional conservatism in Spanish listed companies, we find five works. Interestingly, each one of them uses a different methodology; moreover, as we noted previously, they report different and contradictory results and conclusions.⁷

In this context, most of the literature analysed takes advantage of the mandate of preparing the financial statements for 2004 using the same rules used in the financial statements for 2005. This mandate, which seeks comparability between the two consecutive years, allows the authors to have firms' financial statements for 2004 under two standards, domestic GAAP and IFRS.⁸ In this line, Callao et al. (2007), for IBEX 35 companies, and Callao et al. (2010), for non-financial companies in the General Index of the Madrid Stock Exchange, compute and compare the BtM ratios derived from the two book values of equity. In both cases, the authors conclude that, contrary to expectations, applying IFRS increases balance sheet conservatism.

In the same line, Garrido and Vazquez (2011) estimate cross section value-relevance relations of the book values of net assets and earnings of companies listed on the Spanish Continuous Market and compare the slope coefficients of the Book Value of equity under both regulations applied to financial statements for 2004. Their results show, also against expectations, that there

⁷ In this Spanish context, other works analyse the effect of the application of IFRS on issues other than the conservatism. Callao et al. (2009) discuss its impact on the accounting values; Gonzalez et al. (2014) measure its effect on the accounting relations in financial statements; and Garrido and Sanabria (2014) analyse its influence on the earnings forecasts of financial analysts.

⁸ The same circumstance is exploited by Horton and Serafeim (2010), who perform an event study around the release date the financial statements for 2004 under IFRS, together with an analysis of their value-relevance, to determine the market reaction to this new information.

were no significant changes in unconditional conservatism by applying IFRS.⁹ This result, and those obtained in Callao et al. (2007) and Callao et al. (2010), could be clearly affected by transitory effects, both regulatory and managerial in nature (García-Osma and Pope, 2011; and Kvaal and Nobes, 2012).

More recently, and with more available data, Íñiguez et al. (2013) estimate the value-relevance relation of the book values of net assets and the earnings of companies listed on the Spanish Continuous Market, but now through regressions with pooled data corresponding to five years, the five years before and five years after the implementation of IFRS. In this work, in line with Horton and Serafeim (2007) and Devalle et al. (2010) for Spain, a significant reduction of unconditional conservatism is found, as expected. However, the analysis of changes in the value-relevance of the variable book value of equity carried out in Garrido and Vazquez (2011) and Íñiguez et al. (2013) is not exempt from risk model. The relation between changes in the value-relevance of the variable book value of equity and balance sheet conservatism is conditioned on the theoretical validity of the valuation model used (Ohlson, 1995; and Joos, 1997), which is built on very restrictive assumptions (Gonzalez et al., 2013).

Additionally, in Íñiguez et al. (2013) the authors conduct an analysis using the BtM ratio as a proxy of unconditional conservatism. They compare the BtM means and medians of the five years before and after IFRS adoption. When the authors compare the medians, no significant difference is reported. This evidence is in line with the previous results of Garrido and Vazquez (2011). However, when they compare the means, they find evidence contrary to expectations, i.e., an increase on conditional conservatism, in line with the evidence shown in Callao et al. (2007) and Callao et al. (2010).

In a recent paper, Fullana and Toscano (2016) draw attention to the misuse of firms' BtM ratios to compute proxies of country-specific unobserved variables. They show how the use of firms' BtM ratios to compute a conditional conservatism proxy as in Íñiguez et al. (2013) could bias results. Surprisingly, Íñiguez et al. (2013), contrary to García and Mora (2004), do not use Givoly and Hayn's (2000) methodology to compute the country-aggregate BtM year-end ratio and instead use an average of the BtM ratios across individual companies. In this sense, Fullana and Toscano (2016), based on the country-aggregate BtM ratio, provide evidence that balance-sheet conservatism has not changed due to the implementation of IFRS in Spain.

⁹ Íñiguez et al. (2013) question the scaling of firms' data by share carried out in Garrido and Vazquez (2011) based on the results of Easton and Sommers (2003). Subsequent results, such as those in Barth and Clinch (2009), show that scaling per share, or even unscale, have minor effects on the estimation of this type of model.

On the other hand, when Íñiguez et al. (2013) analyse the dynamics of market-based unconditional conservatism measures, they do not take into account the impact of the dynamics of the growth options value incorporated in the market value of listed companies, as Roychowdhury and Watts (2007), among others, have shown. Moreover, they do not take into account the dynamics of possible explanatory factors of unconditional conservatism other than accounting standards (Nobes, 1998; Ball et al., 2003; and Ding et al., 2007). These facts could influence their results.

3. Hypothesis and methodology

In countries with a continental accounting system such as Spain, the application of IFRS involves a drastic change in accounting practices regarding the previous application of local GAAP. In these countries, accounting practices based on local GAAP are very conservative, so there is a high propensity to unconditional conservatism and usually it occurs at high levels. As we have already mentioned above, in this context, we expect that the transition from GAAP to IFRS reduces these conservative practices and, therefore, the underestimation of firms' net assets, achieving a representation of the economic conditions of the companies more adjusted to reality.

However, actual changes in accounting standards are conditioned by the previous differences between each country's local GAAP and IFRS. In this regard, as we note before, from twenty-one possible accounting differences listed in Bae et al. (2008) that may need to be reconciled when adopting IFRS, they found sixteen between Spanish GAAP and IFRS. So, it is expected that changes in accounting standards have been very important in Spain.

Among all of these differences, only the fact that the current international rules do not make it possible to capitalize the costs of R&D would increase unconditional conservatism, as noted in Íñiguez et al. (2013). However, given the low relative importance of expenditures on R&D in Spanish companies, and being particularly restrictive in capitalizing it prior to the implementation of IFRS rules, we expect a very limited effect of this change on the accounting statements. These facts lead us to establish the following hypothesis:

"The adoption of IFRS by Spanish listed companies has led to a reduction in unconditional, or balance-sheet, conservatism."

To conduct the analyses, the related literature typically uses firms' market information (the market price) when it is available. Balance-sheet conservatism should cause a difference between firms' market and book values. This difference is collected by the BtM ratio and its inverse, the MtB ratio, which are often used as a proxy of unconditional conservatism. Thus, the

companies that apply a higher degree of conservatism are expected to have a lower BtM, as indicated by Ahmed and Duellman (2007), or, alternatively, a higher MtB.

However, the difference between the book value and the market value of the equity of a company is determined not only by unconditional conservatism. The market price also reflects possible operational synergies and future growth opportunities not included in the book value (Roychowdhury and Watts, 2007; and Ball et al., 2013). Therefore, it is very important to control these effects in the analysis of unconditional conservatism from this difference. In this sense, Beaver and Ryan (2000) propose a model that distinguishes two possible sources of variation in the BtM ratio, one that reflects the effect of the accounting processes, i.e. unconditional conservatism, and another that reflects the effect of the expected value of the projects initiated, also known as the value of growth options.

In Beaver and Ryan's (2000) model, a country's unconditional conservatism (UC) is measured by the "component of bias" of the BtM ratios, i.e., the deterministic part of the BtM ratios of the listed companies unexplained for the value of their growth options, as follows:

$$\text{BtM}_{i,t} = \text{UC}_t + \text{VGO}_{i,t} + \text{error}_{i,t} . \quad (1)$$

The model assumes that the part of BtM explained by the value of the growth options (VGO) of each company in each year is determined from the current return ($r_{i,t}$) and delayed returns and is commonly known as the "lagged component of Beaver and Ryan":¹⁰

$$\text{VGO}_{i,t} \equiv \sum_{L=0}^n \alpha_{i,t-L} \cdot r_{i,t-L} . \quad (2)$$

Other authors have used as a proxy of the growth options value firms' characteristics different to returns. These variables were later used in empirical works, separately or jointly, to clean the BtM ratio of the effect of such options. In this way, Ahmed (1994) uses the expenditure on R&D as a variable that captures the options for the future growth of a company. In Nissim and Penman (2001) and Ahmed et al. (2002), the growth of sales is also used to this end. Chava and Jarrow (2004) use industries, considering that growth options vary according to the industry to which the company belongs.

¹⁰ Ahmed et al. (2002), based on Beaver and Ryan (2000), find that conservatism reduces conflicts between shareholders and lenders and also reduces the cost of the debt of the firm. Zhang (2000) draws similar conclusions and notes that lenders benefit from conservatism through debt defaults, whereas borrowers benefit from lower initial interest rates.

In this context, to isolate the effect of changes in the accounting standards in January 2005 on the unconditional conservatism of Spanish listed companies, we must also monitor changes in unconditional conservatism due to idiosyncratic factors unrelated to the accountant rules. For this purpose, we adopt the methodology followed in Ahmed and Duellman (2007) and, in addition to the variables that approximate the value of growth options described above (Beaver and Ryan's lagged component, expenditure on R&D and sales growth), we add the following idiosyncratic control variables to the equation (1):

(i) A size variable to collect an *a priori* indeterminate effect, because although larger companies face higher political costs and therefore tend to be more conservative, they also require more information from stakeholders, which could reduce their accounting conservatism, as La Fond and Watts (2008) note.

(ii) The operating income, because companies with lower operating income have greater difficulty being conservative (Ahmed, 1994).

(iii) The level of debt, with a negative effect on the balance sheet conservatism because, as Ball (2004) argues, unconditional conservatism is inefficient, or at most neutral in procurement processes of debt, so applicant companies try to reduce debt. The results of Ball et al. (2008) corroborate that debt markets do not demand balance sheet conservatism.

(iv) A dichotomous variable that captures the litigation risk of technology companies. Firms that overstate profits and equity are expected to have a higher risk of litigation, and conservatism would reduce the ability of managers to do so. Field et al. (2005) show that technology companies are more exposed to this risk.

Then, the econometric model to estimate becomes the following:

$$\begin{aligned} \text{BtM}_{i,t} = & \text{cons} + \beta_0 \text{IFRS}_{i,t} + \beta_1 \text{Size}_{i,t} + \beta_2 \text{SG}_{i,t} + \\ & \beta_3 \text{RD}_{i,t} + \beta_4 \text{CFO}_{i,t} + \beta_5 \text{Debt}_{i,t} + \beta_6 \text{Litigation}_{i,t} + \sum_{j=7}^{11} \beta_j r_{i,t-j+7} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

where for each *i*-company and each *t*-year,

$\text{BtM}_{i,t}$ is the book-to-market ratio multiplied by minus one, so increases indicate, where appropriate, more unconditional conservatism.

$\text{IFRS}_{i,t}$ is a dummy variable equal to one if the dependent variable belongs to the IFRS period (2005-2009) and equal to zero if it belongs to the pre-IFRS (2000-2004) period.

$Size_{i,t}$	is the natural logarithm of total assets.
$SG_{i,t}$	is the annual percentage sales growth.
$RD_{i,t}$	is investment on R&D divided by sales.
$CFO_{i,t}$	is the actual operating cash flow divided by average total assets. ¹¹
$Debt_{i,t}$	is the total debt divided by the market value of equity.
$Litigation_{i,t}$	is a dummy variable equal to zero if the firm belongs to the technology sector and one otherwise.
$r_{i,t-L}$	is the return on assets for a period t-L, considering from zero up to four delays (L).

In the model shown in equation (3), the slope coefficient on the IFRS dummy captures the effect of applying the new accounting regulation from January 2005 on the BtM ratios. Under our working hypothesis, this coefficient should be positive and significant.

4. Sample

The data sample covers a ten-year period, from 2000 to 2009. This data window is intentionally centred on the beginning of 2005, when Spanish listed firms adopted IFRS. The sample period is divided into two periods of five years each: the previous period (pre-IFRS period) and the period subsequent to that date (IFRS period). These two periods of equal amplitude are long enough to minimize the potential transitory effects, both normative and managerial.

As we summarize in Panel A of Table 1, we use the sample of companies listed on the Spanish Continuous Market with information available in the Compustat Global Vantage database. From a total of 150 companies listed on the Spanish Continuous Market, we remove those belonging to the financial sector,¹² leaving 119 companies. However, only 98 of these 119 companies have

¹¹ We use the real operating cash flow against operating profit as in Givoly and Hayn (2000) because it is a less noisy proxy of the BtM ratio. The real operating cash flow for the company is computed from earnings before extraordinary operations plus depreciation, minus changes in working capital; all items are from the Compustat Global Vantage database. For changes in the working capital, we have used from the same database the inventory items, accounts receivable, other current assets, accounts payable and other current liabilities.

¹² In the accounting literature in general, and particularly in the literature focused on the analysis of conservatism, it is common to exclude financial companies because of their peculiar asset composition. Moreover, the application of specific accounting standards in this sector

data available for the sample period. These 98 companies constitute the final sample used. In Panel C of Table 1, we report their distribution by industry.

In Panel B of Table 1, we list the variables required in the analyses that are also obtained from the Compustat Global Vantage database: Total Assets, Sales Growth Rate, R&D, Operating Cash Flow, Total Debt, BtM ratio, and Sector. To incorporate the effect of the Beaver and Ryan's lagged component, we use series of the market returns for the period 1995-2009.¹³ Panel B of Table 1 summarizes the number of observations for each of the variables. We note that the number of data of the variable R&D is small, so it is assumed that companies do not report such data because they do not incur them and, only for this variable, we fill the holes with zeros. Finally, we select the periods for each company in which all variable data are available. A total of 736 company-year observations remain.

Table 2 shows data summary statistics by variable. We report the mean, standard deviation, minimum and maximum for the BtM ratio, the variables used in the valuation of business growth options, and the variables used to control. The average of BtM is 0.7261 for the period 2000-2009, with a range between -0.4505 and 10.7527. Negative values of BtM ratio correspond to companies whose book value is negative. We have kept these companies in the sample because the market shows for them a positive value.

In Table 3, we report the correlation between the different variables used. In this table, the correlation coefficients of Pearson and Spearman and their level of significance are reported. We observe that the BtM is positively related to the other control variables, although the degree of correlation is low, except for the debt, which has the highest correlation values, -0.673 \ -0.5248 , respectively. In all cases, the correlations are significant for at least one of the two correlation coefficients shown. The low level of correlations between different explanatory variables suggests the absence of significant multicollinearity among these variables.

5. Results

Table 4 shows the point estimations of different specifications of the econometric model in equation (3). These results allow us to measure the differences in unconditional conservatism between the two sub-periods: the pre-IFRS period and the IFRS period. The first two columns, (1) and (2), show the point estimations of equation (3) in a pooled regression by ordinary least

issued by the supervisory authorities leads us to consider this exclusion as more than appropriate and necessary.

¹³ The total market returns have been obtained as relative price changes taking into account dividends and other capital operations.

squares (OLS) for two different model specifications. It is rejected that all slope coefficients are null based on the F statistic.

The results of the OLS estimation of the first specification, which are not controlled by Beaver and Ryan's lagged component, show that all variables used are significant at least at the 10% level, except the IFRS dummy. This fact suggests that the initial choice of variables for the model design is correct. The results for specification (2), which is controlled by Beaver and Ryan's lagged components, show that investment in R&D becomes non-significant. This result could mean that the market returns, both current and lagged, already adequately reflect the growth options as a part of the BtM. Similarly, the variable CFO loses the low significance it had in the previous specification because, despite having been introduced as an explanatory variable of unconditional conservatism, it is also part of the company's profitability included in the current market return. In specification (2), completing the company-year observations requires the availability of data of the last five annual market returns of the company, reducing the number of company-year observations to 429. The slope on the IFRS dummy variable remains non-significant as in specification (1).

However, these pooled regression estimations by OLS are not exempt of endogeneity problems. To control for the effects of the endogeneity, the last two columns, (3) and (4), show the results of estimating the same two model specifications of equation (3) using a panel data estimator systems by GMM (GMM-sys). Arellano and Bover (1995) and Blundell and Bond (1998) design a dynamic estimator for panels with few periods and many individuals where the independent variables are not strictly exogenous, i.e., they are correlated with lagged residuals and likely with the contemporary. This estimator constructs a system of two equations, the original and the original transformed by introducing instrumental variables, and uses the generalized method of moments (GMM), so it is commonly referred to as GMM-sys. The AR(2) test of serial second-order autocorrelation (Arellano and Bond, 1991) does not allow us to reject the null hypothesis of no autocorrelation in specifications (3) and (4). Moreover, the Sargan test also rejects the over-identification of restrictions and guarantees the relevance of the instruments used in the estimation of these specifications.

For specifications (3) and (4), the Wald test rejects that all slope coefficients are jointly null. In specification (3), the slope coefficient on the IFRS dummy is again not significant. Finally, in estimation (4), where we control for Beaver and Ryan's lagged component, the slope on the dichotomous variable IFRS remains not significant. As in specification (2), the inclusion of Beaver and Ryan's lagged component absorbs some of the explanatory power of the Sales Growth Rate variable, which acts as an indicator of business growth in specifications (1) and (3).

6. Conclusions

The EU mandate to adopt IFRS by listed companies in January 1, 2005, was a normative change that augured a reduction of the unconditional conservatism of member countries' companies by removing conservative accounting practices, or at least reducing them. The literature focusing on the analysis of unconditional conservatism uses market values when available because unconditional conservatism induces a gap between the market value and the book value of companies. This difference is collected by the BtM ratio (and its inverse), which is often used as a proxy of unconditional conservatism. We have reviewed five previous related works focused on the Spanish context and have found in them inconsistent and contradictory evidence, much of it unexpected. These works use different methodologies that could be biasing their conclusions.

It is well known that differences between the market value and the book value of companies reflect not only balance-sheet conservatism but also operational synergies and growth opportunities for the business. Thus, although it is accepted that accounting normatively influences unconditional conservatism, there are other factors that could explain both the level of unconditional conservatism of companies and their variation over time. Therefore, to analyse the influence of the normative change due to IFRS adoption on the balance-sheet conservatism of Spanish companies, we have designed a model based on Ahmed and Duellman's methodology (2007) that takes into account all of these factors. Furthermore, we use an estimation technique with panel data that avoids potential problems of endogeneity in these models. Different model specifications are proposed and different estimation techniques (OLS and GMM-sys) are applied to check the influence of all of these issues.

The proposed model has been estimated on a ten-year sample centred on the date of IFRS adoption. It seems to be a time period that is broad enough to mitigate possible transitory effects caused by the normative change. The results show that, for the two specifications of the proposed model and for the two estimation techniques used, the slope on the dummy variable that indicates the difference in the BtM ratio that is unexplained by the control variables before and after application of the IFRS is not significant. This fact suggests that there is no evidence to corroborate the existence of significant changes in unconditional conservatism due to the normative change on January 1, 2005. These results are in line with previous evidence shown in Garrido and Vazquez (2011), in Íñiguez et al. (2013), but only partially, and in Fullana and Toscano (2016).

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Table 1 Summary of the sample, variables and observations

Panel A. Companies sample	
Spanish continuous market	150
Financial companies	29
Non-financial companies	119
Non-financial companies with available data in the period 2000-2009	98

Panel B. Variables and total observations	
Asset	736
Sale Growth Rate	736
R&D expenditures	736
Operating Cash Flow	736
Debt	736
Book-to-market ratio	736
Market returns	1.568

Panel C. Sample companies by sector	
Oil and energy	10
Commodities	31
Consumer Goods	32
Consumer Services	18
Communication and Technology	7

Data from Compustat Global Vantage for companies listed in the Spanish Continuous Market in the period 2000-2009. The market returns have been obtained from the price closed adjusted

series.

Table 2 Summary statistics of variables

Variables	Mean	SD	Min	Q1	Q3	Max
BtM	-0.734	0.842	-10.753	-0.861	-0.307	0.451
Size	2.891	0.807	1.178	2.288	3.392	5.031
SGR	0.137	0.434	-0.570	-0.007	0.190	8.725
RD	0.003	0.027	0.000	0.000	0.000	0.547
CFO	0.082	0.098	-0.370	0.039	0.128	0.539
Debt	1.669	2.883	0.021	0.482	1.796	30.290

For each variable, the mean, the standard deviation (SD), the minimum, the first and third quartiles (Q1, Q3) and the maximum values are reported. BtM is the book-to-market ratio multiplied by minus 1; Size is the natural logarithm of total assets; SGR is the annual percentage sales growth; RD is spending on R&D divided by sales; CFO is the actual operating cash flow divided by average total assets; and Debt is total debt (short and long term) divided by the market value of equity. The total number of observations per variable (736) has been balanced to make the estimation. The number of observations in the pre-IFRS period and IFRS period is 315 and 421, respectively.

Table 3 Correlation between variables

Variables	BtM	Size	SGR	RD	CFO	Debt
BtM		0,1326	0,2851	0,0293	0,1822	-0,5248
Size	[0,0843]		0,1069	[0,0861]	0,104	0,3142
SGR	0,1129	0,0107		-0,1037	-0,0377	(-0,0631)
RD	(0,0649)	-0,0489	-0,0147		-0,0086	0,013
CFO	0,0605	0,0981	-0,1845	-0,1816		-0,2701
Debt	-0,673	0,1828	-0,047	-0,0464	-0,0484	

Below the diagonal is the autocorrelation Pearson coefficient, and above the diagonal is Spearman. The level of significance for each of the values is also reported. 1% in italics, 5% between parenthesis and 10% between brackets. BtM is the book-to-market ratio multiplied by minus 1; Size is the natural logarithm of total assets; SGR is the annual percentage sales growth; RD is spending on R&D divided by sales; CFO is the actual operating cash flow divided by average total assets; and Debt is total debt (short and long term) divided by the market value of equity. The total number of observations per variable (736) has been balanced to make the estimation. The number of observations in the pre-IFRS period and IFRS period is 315 and 421, respectively.

Table 4 Results for model estimations

Variable	Pooled regression – OLS		Panel Data – GMM-sys	
	(1)	(2)	(3)	(4)
IFRS	0.065 (0.120)	-0.015 (0.792)	-0.012 (0.848)	0.066 (0.478)
Size	0.215*** (0.000)	0.207*** (0.000)	0.351*** (0.000)	0.281*** (0.009)
SGR	0.002*** (0.008)	0.001** (0.020)	0.002*** (0.006)	0.001** (0.023)
RD	1.004*** (0.000)	-0.053 (0.965)	53.555 (0.160)	-13.318 (0.602)
CFO	0.366* (0.094)	0.350 (0.199)	0.939 (0.142)	0.112 (0.710)
Debt	-0.205*** (0.000)	-0.189*** (0.000)	-0.305*** (0.000)	-0.283*** (0.000)
Litigious	0.087** (0.043)	0.118* (0.062)		
r		0.047 (0.425)		0.011 (0.951)
r1		0.054 (0.295)		-0.007 (0.978)
r2		0.032 (0.612)		-0.090 (0.445)
r3		0.004		-0.125

		(0.950)		(0.681)
r4		0.014		0.045
		(0.833)		(0.843)
Constant	-1.112 ^{***}	-1.057 ^{***}	-1.494 ^{***}	-1.055 ^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Lag effect	No	Yes	No	Yes
R2 adjusted	0.5054	0.4321		
F	26.42(7,728) ^{***}	12.01(12,416) ^{***}		
	(0.000)	(0.000)		
Wald test			184.00 (6) ^{***}	596.28 (11) ^{***}
			(0.000)	(0.000)
AR(2)			-0.90222	-0.69077
			(0.3669)	(0.4897)
Sargan test			83.2195	60.3950
			(1.000)	(1.000)
Observations	736	429	736	429

The estimated coefficient and p-value in parentheses are reported. BtM is the book-to-market ratio multiplied by minus 1; IFRS is a dummy variable equal to one for the IFRS period (2005-2009) and equal to zero for the pre-IFRS (2000-2004) period; Size is the natural logarithm of total assets; SGR is the annual percentage sales growth; RD is spending on R&D divided by sales; CFO is the actual operating cash flow divided by average total assets; Debt is the total debt (short and long term) divided by the market value of equity; r is the current return; and r1-r4 are the lagged return for periods 1-4. The p-values are calculated using robust matrices, consistent with heteroskedasticity and autocorrelation covariance, using Newey-West (1987) in OLS and Windmeijer (2005) in GMM-sys. The degrees of freedom of the F statistic appear in brackets after the result. The degrees of freedom of the Wald test appear in parentheses after the result. *** p <1%, ** p <5%, * p <10%.