Biases in market-based measure of the conditional conservatism

OLGA FULLANA
Departamento de Economía y Empresa
Universidad CEU Cardenal Herrera
Avda. Seminario s/n, 46113 Moncada (Valencia)
SPAIN
fullanasamper@gmail.com

MARIANO GONZÁLEZ
Departamento de Economía de la Empresa
Universidad San Pablo CEU
Julián Romea 23, 28003 Madrid
SPAIN
gonsan@ceu.es

JUAN M. NAVE
Departamento de Análisis Económico y Finanzas
Universidad de Castilla-La Mancha
Avda. de los Alfares 44, 16002 Cuenca
SPAIN
juan.nave@uclm.es

DAVID TOSCANO
Departamento de Economía Financiera y Contabilidad
Universidad de Huelva
Plaza de la Merced s/n, 21002 Huelva
SPAIN
dtoscano@uhu.es

Abstract: In this paper we analyse the effects of outlier observations and endogeneity on the market-based measurement of conditional accounting conservatism. To address it, we apply a reverse engineering approach by using two alternative samples to estimate a measure of country-specific conditional conservatism – one including outliers and another without the multivariate influential observations identified. In the same way, on the sample without outliers we use two alternative estimation techniques – one affected by endogeneity and another specially designed to deal with the endogeneity problem. We apply this reverse engineering approach to the estimation of a comparative model of the conditional conservatism in order to analyse the effect of the International Financial Reporting Standards first adoption on the country-specific conditional conservatism. We report for both cases the two alternative results whose differences are only due to the outlier bias and the endogeneity bias, respectively. Our results prove the presence of these biases when outliers are not correctly identified and when the Ordinary Least Squares estimation technique is conducted. Moreover, these biases are large enough to result in misleading conclusions.

Keywords: Earnings conservatism; endogeneity; GMM-SYS; IFRS first adoption; market-based accounting research; multivariate outlier detection; OLS; panel data.

1 Introduction

As Huijgen and Lubberink [37] point out, the conservatism is an intrinsic characteristic of accounting. In this sense, Sterling [54] claims that conservatism is "the most ancient and probably the most pervasive principle of accounting valuation".

This accounting principle involves prudence when changes in assets and liabilities values and economic results are accounted. According to Beaver and Ryan [12] and Basu [11], among others, we can observe the accounting conservatism in the financial statements in two ways.

Feltham and Olhson [23] define accounting conservatism as the systematic, and news independent, persistence to undervalue the net assets of the company (equity) through conservative policies and methods. This way of observing the accounting conservatism in the financial statements is named as unconditional, balance sheet or *ex-ante* conservatism. Christie [18] and Fields, Lys and Vincent [25] survey the empirical evidence regarding unconditional conservatism in the literature. Gray [33,34] developed the seed of an international research line in this field.

More recently, Givoly and Hayn [30] have analysed the time evolution of this kind of conservatism in the U.S. The methodology of Givoly and Hayn [30] is being widely used to test the effects of IFRS first adoption on unconditional conservatism and/or the time evolution of unconditional conservatism in several countries, reviving a research stream that had waned by the early 1990s. The papers of García and Mora [27], Fernandes, García and Gonçalves [24], Iñiguez, Poveda and Vázquez [38], Lai, Lu and Shan [41] and Khalifa, Othman and Hussainey [40] that are written in this context are reviewed in Fullana and Toscano [26].

The other way of capturing the presence of accounting conservatism in the financial statements is pointed out by Basu [10] when he defines accounting conservatism as the accountant's practice of recognizing bad news more quickly than good news. It is defined as conditional earnings or *ex-post* conservatism. In his definition, Basu in a simple way translates into financial economics terminology the accounting principle of "anticipate all losses but anticipate no gains", already reflected in the Bliss book [13].

The Basu [10] paper has had an important subsequent influence and, as Hsu, O'Halon and Peasnell [36] note, his model is commonly used to measure the conditional conservatism in the literature. Moreover, it has become one of the principal models of the financial accounting literature. A large number of papers, Pope and Walker [48], Ball, Kothari and Robin [7], Giner and Rees [29], Ryan and Zarowin [51], Sivakumar and Waymire [52], and Beaver and Ryan [12], among others, analyse earnings conservatism using Basu's asymmetric timeliness measure. Ball, Kothari and Nicolaev [6] documented that at July 2013, the Basu [10] paper had 2,116 citations in Google Scholar (as of May 2016 it has 3455) and 355 citations in the Social Sciences Citation Index (as of May 2016 it has 587). This number of citations makes it one of the most highly referenced papers in the modern accounting literature.

As Ball, Kothari and Nicolaev [6] argue, the importance (quantitative and qualitative) of the applications of Basu's model bears out the researchers' confidence in the validity of their estimates. This confidence has been increased by the consistency of the evidence that these applications show. However, it is a blind confidence based on researchers' intuitive appeal, not on rigorous analysis. In fact, the model is not without controversy and some papers, Pae *et al.* [45], Givoly *et al.* [31], Roychowdhury and Watts [50], Dietrich *et al.* [22], Patatoukas and Thomas [46], Ball *et al.* [5,6], Collins *et al.* [19], Cano-Rodriguez and Nuñez-Nickel [16] and Banker *et al.* [8], focus on the discussion around whether the Basu asymmetric timeliness coefficient is a valid measure of conservatism.

In this context, this paper focuses on the effects on the estimated timeliness coefficient of two empirical issues that can introduce bias in the measurement of conditional conservatism. The first is the impact of influential observations present in the accounting and market data used in the Basu [10] model estimation. The second is the endogeneity problem that the econometric specification of Basu's model involves, due to simultaneity in the variables used in its empirical application.

It is generally accepted that both market and accounting data contain outlier and/or influential observations that can bias conclusions. A typical example of their importance in the finance field is shown by Guthrie *et al*. [35]. The paper modifies two observations out of a total of 865, and by doing so the authors demonstrate that conclusions in Chhaochharia and Grinstein [15] are biased. In the market-based accounting research, the majority of papers either truncate or winsorize data to account for potentially influential observations. Adams *et al.* [1] review the techniques used to process influential observations during the last 25 years in the top four journals in the finance field and show results according to this perception. These two approaches are both *ex-ante* and univariate in nature and require *ad-hoc* rules sometimes imported from very different sample contexts by caution or justification outward.

In this sense, Leone *et al.* [42] document that between 2006 and 2014 in the top five accounting journals the two dominant approaches used in market-based research papers to handle observations a researcher thinks might be influential are truncation and winsorization. However, they also document that 32% of the empirical papers analysed do not mention influential observations at all or do not clearly describe an approach to identify influential observations. Moreover, these results show that winsorization and truncation are largely ineffective in dealing with observations that are actually influential.

To measure the effect of the influential observations we use two alternative samples in our empirical analysis. One is the sample with the raw data that include, if any, multivariate influential observations. The other is a sample where influential observations identified by the minimum covariance determinant (*mcd*) multivariate method are removed. We use these two alternative samples in two separate estimations of a comparative model of the conditional conservatism based on Basu's model and design *a la* Ball, Kothari and Robin [7]. These estimations are performed with a technique that avoids endogeneity bias.

With this methodology we analyse the effect of IFRS mandatory first adoption by listed firms on their conditional conservatism. We find that significant differences arise between results from the two alternative samples. These results confirm the presence of an outlier bias when influential observations are present. Moreover, this bias is large enough to alter the findings.

On the other hand, as it is well known, the endogeneity problem induces biases in the coefficients estimated by Ordinary Least Squares (OLS) and in their standard errors. Changes in the error term affect not only the dependent variable but also the independent variables (Dietrich *et al.* [22], Wang *et al.* [58] and Dechow *et al.* [21]). To measure the endogeneity effect on the Basu asymmetric timeliness coefficient we use two alternative techniques for estimate the Basu's model: OLS and System Generalized Method of Moments (GMM-sys), specially designed for panel data with endogeneity problems (Arellano and Bover [3] and Blundell and Bond [14]).

We apply these two alternative estimation procedures to the comparative model of conditional conservatism described above. In this case, to avoid a possible outlier bias we use the sample without the influential observations previously identified. We find that significant differences arise between results provided by the two alternative estimation techniques. These results confirm the presence of an endogeneity bias. Moreover, this bias is large enough to change the conclusions of our analysis.

The remainder of this paper is structured as follows. Section 2 shows the econometric models used to measure conditional conservatism. The sample and data are described in Section 3. In Section 4 the estimates are shown and discussed. Finally, Section 5 concludes.

2 Market-based measurement of conditional conservatism

2.1 Basu's (1997) (econometric) model

In Basu [10] conditional conservatism is considered as a consequence of the tendency in the accounting practice to require a greater degree of verification to recognize the positive news than to recognize the negative news. Under this interpretation, the income statement reflects bad news faster than good news, being conditioned to the relative importance of good and bad on the total news of the period. Likewise, the slow incorporation of the good news to the results causes an increase in their time persistence.

The basic idea in Basu [10], used by the author to formulate the econometric model developed to measure the degree of conditional conservatism, is the efficiency of capital markets. The market efficiency of the assets, at its strongest level, involve that both good and bad news, which could be accounted for, are included in the market price. Thus, the gap between the recognition of income and expenses, which bias the financial results, is not present in market returns. This is computed from the stock prices that symmetrically collect all the news related to the profit and loss account. From this perspective, it is expected that the correlation between market returns and firm earnings is higher when market returns are negative (bad news) that when those returns are positive (good news).

Basu captures this idea through modelling a linear relationship between firm earnings and market returns, allowing a different relationship when returns are positive than when returns are negative. The difference between these two linear relationships measures conditional conservatism. The analytical expression of the proposed model by Basu is as follows:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \lambda_0 + \lambda_1 D_{i,t} + \lambda_2 R_{i,t} + \lambda_3 D_{i,t} R_{i,t} + \mu_{i,t} \quad (1)$$

where:

$EPS_{i,t}$ is earnings per share of the *i*-firm for period *t*;
$P_{i,t-1}$ is the stock price market of the *i*-firm at the beginning of the period *t*;
$D_{i,t}$ is a dichotomous variable equal to one if market return of the *i*-firm for period *t* is negative and zero otherwise; and
$R_{i,t}$ is the market return of the *i*-firm for period *t*.

The coefficient λ_3 in equation (1) measures the average intensity of asymmetric relations between earnings and market returns of all companies considered, i.e. it measures the (equally-weighted) average of the conditional conservatism degree for the group of companies that comprise the sample used in the analysis. When conditional conservatism affects earnings, we expect that λ_3 is positive and significant.

In equation (1) returns are used as a proxy for news, i.e., in the unstated underlying economic model "news" is the independent variable. Then, the empirical model appears to reverse the traditional return-earnings model. Actually, in footnote seven of Basu [10] the author calls his model as "simple 'reverse' regression" and explicitly recognizes this fact. The use of returns as news proxy induces an endogeneity problem since earnings (the dependent variable in the model) cause returns, and then a simultaneity problem arises.

Another econometric problem comes from the need to define the good and bad news from returns as Dietrich *et al.* [22] highlight. The level of returns that partitions news into good and bad news is arbitrarily selected and obviously affects results. In this paper we do not address this issue, so we select as a cut-off level the most common in the literature: zero return. We maintain this election along our analysis with the aim that this problem does not interfere in our conclusions.

2.2 Testing the variation in conditional conservatism

Ball *et al.* [7] were pioneers in enlarging Basu's model to perform comparative analyses. They used their model specification to introduce an international perspective in the analyses and test conditional conservatism differences among the seven countries analysed. Following Ball *et al.* [7], several authors have analysed variation in conditional conservatism across different contexts. Their framework is useful to test the major explanations of accounting conservatism listed by Watts [59]: contractual relations, relations with shareholders, taxation and accounting regulations, as well as searching for new interpretations of (and consequences of) conditional conservatism. Changes in accounting regulation, the last of the four circumstances list by Watts [59] that induce accounting conservatism, justifies a body of empirical work dedicated to measuring the effects on conditional conservatism caused by the country adoption of IFRS from local GAAP.

In the presence of a pooled sample with *n* groups of firm-observations defined by a specific characteristics, e.g., that belong to different countries, Ball *et al.* [7] adapt Basu´s model by adding *n-1* dummy variables that permits achieving *n* different coefficients of Basu´s model avoiding multicollinearity. The coefficients of the group without a specific dummy variable are the base coefficients and the rest are incremental coefficients relative to the base. We use this framework to analyse the effect of the adoption of IFRS on conditional conservatism. The date of the first IFRS adoption divides the whole sample into two subsamples defined by two time periods: the local GAAP period prior to the date of the first IFRS adoption, and the IFRS period that starts at this date. To carry out this analysis, we adapt Basu's model in equation (1) as follows:

$$\begin{aligned} \frac{EPS_{i,t}}{P_{i,t-1}} &= \alpha_0 + \alpha_1 IFRS_t + \alpha_2 D_{i,t} + \\ &+ \alpha_3 IFRS_t D_{i,t} + \alpha_4 R_{i,t} + \alpha_5 IFRS_t R_{i,t} + \\ &+ \alpha_6 D_{i,t} R_{i,t} + \alpha_7 IFRS_t D_{i,t} R_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where the dichotomous variable $IFRS_t$ is equal to one if *t* belongs to the IFRS period, and equal to zero if t belongs to the previous local GAAP period; and the other variables are defined as in equation (1).

In equation (2) the parameter that measure the difference between conditional conservatism previous to the date of the first IFRS adoption and after that date, is α_7. The sign and significance of α_7 becomes an empirical question due to the different arguments, hypothesis and evidence about them found in the literature (Barth *et al*. [9], García *et al*. [28], Kabir *et al.* [39], Zhang [61] and Piot *et al*. [47]). On the other hand, parameter α_6 measures conditional conservatism in the local GAAP period, and (α_6 + α_7) measures conditional conservatism in the IFRS period. The contemporary response of earnings to good news (positive returns) is measure in equation (2) by α_4 for the local GAAP period and by (α_4 + α_5) for the IFRS period. In the same way, the contemporary response of earnings to bad news (negative returns) is measure by (α_4 + α_6) for the local GAAP period and by (α_4 + α_5 + α_6 + α_7) for the IFRS period.

3 Sample and data

With respect to the selection of the data sample to implement our analysis, it is crucial to not mix the data of firms whose different environmental characteristics may suggest that the effect of changes in the accounting normative on their financial statements differs significantly among them. In this regard, Daske *et al.* [20] alerts readers to the danger of mixing voluntary and mandatory adopters. Joining together data of continental and Anglo-Saxon systems can also be problematic insomuch as in the continental systems accounting numbers have low volatility under the local GAAP (Ball *et al.* [7]) and it is expected to increase with IFRS adoption (Leuz *et al*. [43], Rivard *et al*. [49], Ball [4] and Graham *et al*. [32]). Finally, Soderstrom and Sun [53] note that the political and legal system in which firms are located also affects the financial statements quality. Following all these arguments and with the aim of not distorting our results and/or hindering the interpretation, we select a sample of firms that adopted IFRS by mandate and belong to a single country, and thus a single accounting-, political-, and legal-system. Concretely, we use data of the Spanish listed firms that in January 2005 by an UE mandate adopted IFRS for the first time.

All sample data required for our analysis are obtained from the Compustat Global Vantage database. As Table 1 summarizes, a total of 148 companies listed on the Spanish continuous market are included in the database. From these firms, 41 belong to the financial industry according to the sector classification of the Madrid Stock Exchange. And only 103 of the remaining 107 have data available in our analysis period of 18 years, from 1995 to 2012. The number of firm-year observations for which we have all required data is 1,255.

Then, using the *mcd* method for multivariate outlier detection as performed by Verardi and Dehon [57] we identify 293 firm-year observations with atypical values. Note that atypical values in a multidimensional context are not considered anomalous due to the value of one variable but to the values of all of them together. So, their identification is more difficult than in the univariate case.

In this context, contrary to the univariate case, extreme values do not correspond to atypical values. Moreover, atypical values in the multivariate context are more damaging than in the univariate case since they distort not only the mean and the variance of the variables involved but also the covariance between them, which is what we want to analyse. In Figure 1 we show the effect of removing outliers in our initial sample.

Verardi and Dehon [57] show that the *mcd* procedure performs better than other procedures, such as the Hadi method. The well known masking effect and swamping effect (Chiang [17]) are minimised in the *mcd* procedure, and a fast algorithm developed by Verardi and Croux [56] and Verardi [55] is available in STATA. This method searches among subsamples with different data for the minimum determinant of its variance-covariance matrix. The underlying fact, which it is based on, is the inverse relation between the variance-covariance determinant and the intensity of correlations.

The time period of the sample is not centred on the date of the first application of IFRS by listed companies in the Spanish continuous market, thus the local GAAP period is longer. This fact reflects an attempt to balance the subsamples data. Thus, the initial sample is divided in two subsamples corresponding to the local GAAP period and the IFRS period with 551 and 704 firm-year observations respectively. In the same way we form two subsamples without outliers, one corresponding to the local GAAP period (from 1995 to 2004) that has 449 firm-year observations (from 74 companies), and another with 513 firm-year observations (from 103 companies) corresponding to the IFRS period (from 2005 to 2012). In Figure 2 and Figure 3 we show the effect of remove outliers in the two initial subsamples.

Table 2 shows the variables used and their summary statistics, both for the whole sample in Panel A and for the two subsamples: the local GAAP period in Panel B, and the IFRS period in Panel C. We extract directly from the database the following variables: the December-end firm market capitalization from 1994 to 2011 (MKVAL); annual firm net income (NI) and annual firm minority interest (MII), that we sum to compute annual earnings before extraordinary items; and finally, monthly market returns including dividends (MKRTXM: by ex-date) that we compose to compute annual market returns. The dependent variable, annual earnings per share over the share price at the beginning of the year, is computed as the annual earnings before extraordinary items over the December-end firm market capitalization of the previous year.

4 Results

Firstly, we discuss the results to estimate the comparative model in equation (2) by GMM-sys in order to avoid endogeneity bias using the two alternative samples describe above. In Table 3 we show the results for three different specifications of the model when the initial sample (with outliers) is used. And in Table 5 we report the same information using the sample without outliers.

Both results are quite similar for the specification (i) that does not take into account the asymmetric timeless or the normative change. In the specification (ii), that takes into account the asymmetric timeless but not the normative change, i.e., the original Basu´s econometric model in equation (1), the parameter α_6 that measure conditional conservatism is significant at the 5% level when the sample that includes outliers is used (Table 3). However, surprisingly it is negative, suggesting aggressive news-conditional accounting practices. Moreover, the sum (α_4 + α_6) is also negative and significant at the 5% level, suggesting that negative news has a positive impact on earnings. When we move to the sample without outliers to estimate Basu´s model, α_6 becomes not significant (Table 5) and the sum (α_4 + α_6) is positive and significant at the 1% level, so important differences arise.

Finally, for the complete comparative model in the specification (iii), i.e., when we additionally take into account the normative change, results in Table 3 show that when we use the initial sample with outliers, conditional conservatism in the GAAP period measured by α_6 is not significant. Besides, the normative change causes a significant reduction on conditional conservatism measured by α_7. However, the joint effect of these results, measured by (α_6 + α_7) show that for the IFRS period significance at the 1% level for negative conditional conservatism arises. Again, results using this sample show evidence of aggressive news-conditional accounting practices, now only in the IFRS period. Also the sum (α_4 + α_5 + α_6 + α_7) is negative and significant at the 5% level in the IFRS period suggesting again that negative news has a positive impact on earnings.

In Table 5, when we use the sample without outliers, these anomalous results change suggesting that conditional conservatism exists in the GAAP period (α_6 is positive and significant al 1% level). Also, that the IFRS adoption reduces significantly conditional conservatism (α_7 is negative and significant at the 1% level), and that however in the IFRS period unconditional conservatism remains significant since the sum (α_6 + α_7) remains positive and significant at 1% level.

From this point we discuss the results of estimating the comparative model in equation (2) alternatively by OLS (with pooled data) and by GMM-sys (with panel data) reported in Table 4 and Table 5, respectively. In all these estimations the sample without outliers is used in order to avoid the outliers bias documented above. As before, we estimate three specification of the model.

In the specification (i) that does not account for the asymmetric timeless or the normative change, we can observe through the parameter α_4 that market returns explain earnings at the 1% level of significance. In the OLS estimation the R^2 of approximately 28% is higher than what has been found in other papers due to the more rigorous outliers selection procedure used. The constants are also significant and thus the Wald test in both OLS and GMM-sys estimates are also significant at the 1% level.

In the specification (ii) that takes into account the asymmetric timeless but not the normative change, independently of the estimation technique used, the parameter α_6 that measures conditional conservatism is not significant. This result could be affected by the normative change through the adoption of IFRS. The value of R^2 (in the OLS estimation) and the Wald test significance remain in the levels observed in specification (i).

Specification (iii) in Table 4 and Table 5 shows results for the full comparative model in equation (2), designed *a la* Ball, Kothari and Robin [7]. When it is estimated using OLS pooled regression, results in Table 4 show that the introduction of the normative change in the analysis has not affected conditional conservatism in the local GAAP period where it (measured by α_6) remains not significant. Moreover, the effect of the IFRS adoption measured by α_7 does not modify it significantly, though the negative sign of this slope parameter points more toward an average reduction than an average increment. This result is in line with previous evidence found by Andre and Filip [2] in the same context that, to the best of our knowledge, is unique in the literature. In a European analysis, Andre and Filip [2] also use OLS pool-data estimations and show specific results for Spain with no significant values for conditional conservatism before IFRS adoption, along with a no significant change of it (but positive in contrast to ours) due to the IFRS adoption.

The tests of significance of the meaningful sums of parameters described in Section 2.2 confirm that IFRS introduction did not change the fact that there was not accounting conservatism in the local GAAP period since ($\alpha_6 + \alpha_7$) remains not significant. In the other three cases, these tests confirm that in both periods both kinds of news (positive and negative returns) explain earnings significantly.

Alternatively, results in Table 5, which estimate the full specification (iii) of the comparative model in equation (2) by GMM-sys with panel data, show that there was significant conditional conservatism in the local GAAP period at the 1% level. These results are additional evidence that IFRS adoption implies a significant reduction at the 1% level of conditional conservatism. However, the significance, also at the 1% level, of ($\alpha_6 + \alpha_7$) shows that conditional conservatism is not removed completely in the IFRS period. Interestingly, these three results are contrary to those reported in Table 4 when the comparative model in equation (2) is estimated by OLS with pooled data. The results of the other tests of significance of the meaningful sums of parameters in Table 5 show a reduction in the significance of both positive and negative news following IFRS adoption. Another outcome not captured by the OLS estimation.

5 Conclusions

Despite the great importance of Basu's [10] paper in the measure of conditional conservatism that we have documented, the empirical model implemented in it has been questioned in the literature mainly in two ways: because it can induce a misspecification bias and because it can introduce econometric estimation problems that also bias results. In this context, this paper focuses on the effects on the estimated results of two econometric estimation issues: the presence of multivariate outliers in the samples used in the model(s) estimations and the endogeneity that the econometric specification of Basu's model involves due to simultaneity in the two variables used in its empirical implementation.

We analyse these two econometric estimation issues by performing a comparative analysis of results achieved estimating a comparative model of the conditional conservatism. This model is based on Basu's model and design *a la* Ball, Kothari and Robin [7]. In this framework, we concretely analyse the effect of IFRS first adoption on conditional conservatism of firms of a single accounting-, political-, legal- system sample(s) where only listed firms, and by mandate, adopted IFRS: the Spanish listed firms.

To isolate the effect of the influential observations on the estimated model slope parameters we use two alternative samples. One of these samples contains the available raw data and the other one excludes outliers previously identified through an advanced multivariate method. For this analysis we use the System Generalized Method of Moments (GMM-sys) avoiding, if any, endogeneity bias.

With regards to measuring the endogeneity effect on Basu's asymmetric timeliness coefficient we use two alternative techniques to estimate the model(s). The first is the usual Ordinary Least Squares (OLS) approach whose estimations, as is well known, are biased in the presence of endogeneity. The alternative estimation technique we use is GMM-sys that, in contrast, is specially designed for panel data with endogeneity problems. In this case, we avoid outlier bias, if any, using the sample after processing outliers.

Reported results show that in absence of outliers processing counterintuitive estimates arise. Conditional conservatism in the GAAP period is not significant. The normative change causes a significant reduction on conditional conservatism. This reduction supposes that, for the IFRS period, a significant negative conditional conservatism arises suggesting aggressive news-conditional accounting practices. And finally, results also suggest that in the IFRS period negative news has a positive impact on earnings.

Our results also show that when we use OLS with pooled data the effect of the IFRS adoption does not affect conditional conservatism significantly in line to previous evidence. Results also show that conditional conservatism is significant neither before IFRS adoption nor after. Finally, results confirm that in both periods analysed both kinds of news (positive and negative returns) explain earnings significantly.

By contrast, when we identify and remove multivariate outliers in the raw data and simultaneously use GMM-sys with panel data to estimate the model, we achieve coherent results. There was highly significant conditional conservatism in the GAAP period. The IFRS adoption reduces significantly conditional conservatism. And finally, the IFRS period unconditional conservatism remains highly significant.

These results show empirical evidence of that samples without correct outliers processing and OLS estimations induce biases in the estimates of Basu's asymmetric timeliness coefficient. Moreover, these biases can be large enough to modify empirical research conclusions. Finally, and beyond the main objective of this paper, note that we also report for the first time, to our knowledge, robust results concerning conditional conservatism in Spain: we provide evidence supporting its presence in the income statement before IFRS adoption, of its reduction due to IFRS adoption and of its significant continuity after IFRS adoption.

Acknowledgments:
The authors are grateful for the comments by Cristina Abad, Juan M. García, Caleb Houston and Gonzalo Rubio, and by participants in the seminars at Mississippi State University (United States), Universidad de Huelva (Spain), Universidad CEU Cardenal Herrera (Spain) and Universidad de Castilla – La Mancha (Spain). They are also grateful for the financial support from the Spanish Government (MINECO ECO2012-36685 and MINECO/FEDER ECO2015-65826-P) and from *Cátedra Universidad CEU San Pablo – Mutua Madrileña*. An earlier version of this paper entitled "Endogeneity bias in the OLS estimates of Basu's model" was published on-line as ICFA'16 Conference Proceedings in the *International Journal of Economics and Management Systems,* Vol. **1**, pp. 134-143.

References:
[1] Adams, J.C., Hayunga, D.K. and Verardi, V. Outliers in Finance Research. *WP – University of Texas (Arlington)*, 2014.
[2] André, P. and Filip, A. Accounting conservatism in Europe and the impact of mandatory IFRS adoption: Do country, institutional and legal differences survive. *WP 95021 – ESSEC Business School Cergy-Pontoise,* 2012.
[3] Arellano, M. and Bover, S.R. Another look at the instrumental variables estimation of error-components models. *Journal of Econometrics,* Vol. 68, No. 1*,* 1995, pp. 29-51.
[4] Ball, R. Corporate Governance and Financial Reporting at Daimler-Benz (DaimlerChrysler) AG: From a "Stakeholder" toward a "Shareholder Value" Model. In C. Leuz, D. Pfaff and A. Hopwood: *The Economics and Politics of Accounting: International Perspectives on Research Trends, Policy, and Practice,* 2004, pp. 103-143. Oxford: Oxford University Press.
[5] Ball, R., Kothari, S.P. and Nikolaev, V.V. On estimating conditional conservatism. *The Accounting Review*, Vol. 88, No. 3, 2012, pp. 755-787.
[6] Ball, R., Kothari, S.P. and Nikolaev, V.V. Econometrics of the Basu asymmetric timeliness coefficient and accounting conservatism. *Journal of Accounting Research*, Vol. 51, No. 5, 2013, pp. 1071-1097.
[7] Ball, R., Kothari, S.P. and Robin, A. The effect of international institutional factors on properties of accounting earnings. *Journal of Accounting and Economics,* Vol. 29, No. 1, 2000, pp. 1-51.
[8] Banker, R.D., Basu, S., Byzalov, D. and Chen, J.Y. The confounding effect of cost stickiness on conservatism estimates. *Journal of*

Accounting and Economics, Vol. 61 No. 1, 2015, pp. 203-220.

[9] Barth, M.E.; Landsman, W.R. and Lang, M. H.,. International Accounting Standards and accounting quality. *Journal of Accounting Research,* Vol. 46, No. 3, 2008, pp. 467-498.

[10] Basu, S. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics,* Vol. 24, No. 1, 1997, pp. 3-37.

[11] Basu, S. Discussion of "Conditional and unconditional conservatism: concepts and modelling". *Review of Accounting Studies,* Vol. 10, No. 2, 2005, pp. 311-321.

[12] Beaver, W.H. and Ryan, S.G. Conditional and unconditional conservatism: concepts and modelling. *Review of Accounting Studies*, Vol. 10, No. 2, 2005, pp. 269-309.

[13] Bliss, J.H. *Management through accounts*. Ronald Press Company, New York, 1924.

[14] Blundell, R.W. and Bond, S.R. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, Vol. 87, No. 1, 1998, pp. 115-143.

[15] Chhaochharia, V. and Grinstein, Y. CEO compensation and board structure. *The Journal of Finance*, Vol. 64, No. 1, 2009, pp. 231-261.

[16] Cano-Rodriguez, M. and Nuñez-Nickel, M. Aggregation bias in estimates of conditional conservatism: theory and evidence. *Journal of Business, Finance and Accounting,* Vol. 42, No. 1-2, 2015, pp. 51-78.

[17] Chiang J. The Masking and Swamping Effects Using the Planted Mean-Shift Outliers Models. *International Journal of Contemporary Mathematical Sciences*, Vol. 2, No. 7, 2007, pp. 297-307.

[18] Christie, A.A. Aggregation of test statistics: An evaluation of the evidence on contracting and size hypotheses. *Journal of Accounting and Economics*, Vol. 12, No. 1, 1990, pp. 15-36.

[19] Collins, D.W., Hribar, P., and Tian, X.S. Cash flow asymmetry: Causes and implications for conditional conservatism research. *Journal of Accounting and Economics*, Vol. 58, No. 2, 2014, pp. 173-200.

[20] Daske, H., Hail, L., Leuz, C. and Verdi, R. Mandatory IFRS reporting around the world: early evidence on the economic consequences. *Journal of Accounting Research,* Vol. 46, No. 5, 2008, pp. 1085-1142.

[21] Dechow, P.M., Ge, W. and Schrand, C. Understanding earnings quality: a review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics,* Vol. 50, No. 2, 2010, pp. 344-401.

[22] Dietrich, J.R., Muller, K.A. and Riedl, E.J.,. Asymmetric timeliness tests of accounting conservatism. *Review of Accounting Studies*, Vol. 12, No. 1, 2007, pp. 95-124.

[23] Feltham, G.A. and Ohlson, J.A. Valuation and clean surplus accounting for operating and financial activities. *Contemporary Accounting Research,* Vol. 11, No. 2, 1995, pp. 689-731.

[24] Fernandes, L., García, J.M. and Gonçalves, T. Accounting conservatism in Portugal: Similarities and differences facing Germany and the United Kingdom. *Revista de Administração Contemporânea*, Vol. 11, No. SPE2, 2007, pp.163-188.

[25] Fields, T.D., Lys, T.Z. and Vincent, L. Empirical research on accounting choice. *Journal of accounting and economics*, Vol. 31, No. 1, 2001, pp. 255-307.

[26] Fullana, O. and Toscano, D. On the use of the aggregate Book-to-Market ratios. *International Journal of Economics and Management Systems*, Vol 1, 2016, pp. 144-152.

[27] García, J.M. and Mora, A. Balance sheet versus earnings conservatism in Europe. *European Accounting Review*, Vol. 13, No. 2, 2004, pp. 261-292.

[28] García, J.M., Torres, J.A. and Veira, P.J. Conservatism of earnings reported under International Accounting Standards: A comparative study. *Spanish Journal of Finance and Accounting*, Vol. 37, No. 139, 2008, pp. 197-210.

[29] Giner, B. and Rees, W. On the asymmetric recognition of good and bad news in France, Germany and the United Kingdom. *Journal of Business Finance and Accounting*, Vol. 28, No. 9-10, 2001, pp. 1285-1331.

[30] Givoly, D. and Hayn, C. The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative? *Journal of Accounting and Economics*, Vol. 29, No. 3, 2000, pp. 287-320.

[31] Givoly, D., Hayn, C.K. and Natarajan, A. Measuring reporting conservatism. *The Accounting Review*, Vol. 82, No. 1, 2007, pp. 65-106.

[32] Graham, J.R.; Harvey, C.R. and Rajgopal, S. The economic implications of corporate financial reporting, *Journal of Accounting and Economics,* Vol. 40, No. 1, 2005, pp. 3-73.

[33] Gray, S.J. The impact of international accounting differences from a security-analysis perspective: some European evidence. *Journal*

of Accounting Research, Vol. 18, No. 1, 1980, pp. 64-76.

[34] Gray, S.J. Towards a theory of cultural influence on the development of accounting systems internationally. *Abacus*, Vol. 24, No. 1, 1988, pp. 1-15.

[35] Guthrie, J., Ricceri, F. and Dumay, J. Reflections and projections: a decade of intellectual capital accounting research. *The British Accounting Review*, Vol. 44, No. 2, 2012, pp. 68-82.

[36] Hsu, A., O'Hanlon, J. and Peasnell, K. The Basu measure as an indicator of conditional conservatism: Evidence from UK earnings components. *European Accounting Review*, Vol. 21, No. 1, 2012, pp. 87-113.

[37] Huijgen, C. and Lubberink, M. Earnings Conservatism, Litigation and Contracting: The Case of Cross-Listed Firms. *Journal of Business Finance and Accounting,* Vol. 32, No. 7-8, 2005, pp. 1275-1309.

[38] Iñíguez, R., Poveda, F. and Vázquez, P.J. The effect of IFRS adoption on balance-sheet conservatism: the Spanish case. *Spanish Journal of Finance and Accounting,* Vol. 42, No. 160, 2013, pp. 453-486.

[39] Kabir, M.H., Laswad, F. and Islam, M.A. Impact of IFRS in New Zealand on accounts and earnings quality. *Australian Accounting Review*, Vol. 20, No. 4, 2010, pp. 343-357.

[40] Khalifa, M., Othman, H.B. and Hussainey, K. Temporal variation and cross-sectional differences of accounting conservatism in emerging countries. *International Journal of Accounting, Auditing and Performance Evaluation*, Vol. 12, No. 1, 2016, pp. 45-69.

[41] Lai, C., Lu, M. and Shan, Y. Has Australian financial reporting become more conservative over time? *Accounting and Finance*, Vol. 53, No. 3, 2013, pp. 731-761.

[42] Leone, A. J., Minutti-Meza, M. and Wasley, C. E. Influential observations and inference in accounting research. *WP FR 14 – 06 – Simon Business School*, 2015.

[43] Leuz, C., Nanda, D. and Wysocki, D. Earnings management and investor protection: An international comparison. *Journal of Financial Economics,* Vol. 69, No. 3, 2003, pp. 505-527.

[44] Newey, W.K. and West, K.D. A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica,* Vol. 55, No. 3, 1987, pp. 703-708.

[45] Pae, J., Thornton, D.B. and Welker, M. The link between earnings conservatism and the Price-to-Book ratio. *Contemporary Accounting Review* Vol. 22, No. 3, 2005, pp. 693-717.

[46] Patatoukas, P.N. and Thomas, J.K. More evidence of bias in the differential timeliness measure of conditional conservatism. *The Accounting Review*, Vol. 86, No. 5, 2011, pp.1765-1793.

[47] Piot, C., Dumontier, P. and Janin, R. IFRS consequences on accounting conservatism within Europe: the role of big 4 auditors. *WP-SSRN Series,* 2011.

[48] Pope, P.F. and Walker, M. International differences in the timeliness, conservatism, and classification of earnings. *Journal of Accounting Research*, Vol. 37, 1999, pp. 53-87.

[49] Rivard, R.J., Bland, E. and Hatfield, G.B. Income Smoothing Behaviour of U.S. Banks under Revised International Capital Requirements. *International Advances in Economic Research,* Vol. 9, No. 4, 2003, pp. 288-294.

[50] Roychowdhury, S. and Watts, R. L. Asymmetric timeliness of earnings, market-to-book and conservatism in financial reporting. *Journal of Accounting and Economics*, Vol. 44, No. 1, 2007, pp. 2-31.

[51] Ryan, S.G. and Zarowin, P.A. Why has the contemporaneous linear returns-earnings relation declined? *The Accounting Review*, Vol. 78, No. 2, 2003, pp. 523-553.

[52] Sivakumar, K. and Waymire, G. Enforceable accounting rules and income measurement by early 20th century railroads. *Journal of Accounting Research*, Vol. 41, No. 2, 2003, pp. 397-432.

[53] Soderstrom, N. and Sun K. IFRS adoption and accounting quality: A review. *European Accounting Review*, Vol. 16, No. 4, 2007, pp. 675-702.

[54] Sterling, R.R. Conservatism: The Fundamental Principle of Valuation in Traditional Accounting. *Abacus*, Vol. 3, No. 2, 1967, pp.109-132.

[55] Verardi, V., 2010. Software update: st0173_1: Robust regression in Stata. *Stata Journal,* Vol. 10*,* p. 313.

[56] Verardi, V. and Croux, C. Robust regression in Stata. *The Stata Journal*, Vol. 9, No. 3, 2009, pp. 439-453.

[57] Verardi, V. and Dehon, C., 2010. Multivariate outlier detection in Stata. *The Stata Journal*, Vol. 10, No. 2, pp. 259-266.

[58] Wang, Z., Zijl, T.V. and O´Hogartaigh, C. Measures of accounting conservatism: A

construct validity perspective. *Journal of Accounting Literature,* Vol. 28, 2009, pp. 165-203.

[59] Watts, R.L. Conservatism in accounting part I: explanations and implications. *Accounting Horizons,* Vol. 17, No. 3, 2003, pp. 207-221.

[60] Windmeijer, F. A finite sample correction for the variance of linear efficient two-step GMM estimators. *Journal of Econometrics*, Vol. 126, No. 1, 2005, pp. 25–51.

[61] Zhang, J. *The effect of IFRS adoption on accounting conservatism – New Zealand perspective* (Doctoral dissertation, Auckland University of Technology), 2011.

Table 1. Summary of firms sample, variables and observations

Panel A. Firms sample	
Spanish continuous stock market	148
No financial companies	107
With available data in 1995-2012 period	103
Panel B. Firm-year observations	
Initial sample: with data for all variables [1]	1255
Sub-sample pre-IFRS (1995 – 2004)	551
Sub-sample post-IFRS (2005 – 2012)	704
Multivariate outliers identified	293
Sample after remove outliers	962
Sub-sample pre-IFRS (1995 – 2004)	449
Sub-sample post-IFRS (2005 – 2012)	513

[1] From *Compustat Global Vintage* database we have obtained the following primary variables: December-end firm market capitalization from 1994 to 2011 (MKVAL); annual firm net income (NI), annual firm minority interest (MII); monthly market returns including dividends (MKRTXM: by ex-date).

Table 2. Sample data: summary statistics.

Panel A. Period: 1995 – 2012. # Firms: 98. # Observations: 962.

	mean	sd	min	Q1	median	Q3	max
Capitalization	3.8704	10.4245	0.0073	0.1467	0.5331	2.3119	104.634
Earnings	0.2898	0.8530	-0.0321	0.0080	0.0334	0.1440	10.0720
EPS_t/P_{t-1}	0.0681	0.0365	-0.0203	0.0432	0.0666	0.0928	0.1629
Return	0.0592	0.3134	-0.8287	-0.1288	0.0774	0.2799	0.9333

Panel B. Period: 1995 – 2004. # Firms: 72. # Observations: 449.

	mean	sd	min	Q1	median	Q3	max
Capitalization	8.7499	0.0076	0.1139	0.3602	1.5780	80.9180	8.7499
Earnings	0.4632	-0.0006	0.0078	0.0220	0.1046	3.2583	0.4632
EPS_t/P_{t-1}	0.0747	0.0357	-0.0123	0.0495	0.0722	0.0992	0.1629
Return	0.1007	0.2925	-0.7442	-0.0819	0.1278	0.2973	0.9057

Panel C. Period: 2005 – 2012. # Firms: 98. # Observations: 513.

	mean	sd	min	Q1	median	Q3	max
Capitalization	4.6299	11.6369	0.0073	0.2175	0.8259	2.9551	104.634
Earnings	0.3735	1.0719	-0.0321	0.0085	0.0502	0.1772	10.0720
EPS_t/P_{t-1}	0.0623	0.0361	-0.0203	0.0374	0.0612	0.0863	0.1628
Return	0.0230	0.3263	-0.8287	-0.1565	0.0370	0.2543	0.9333

Note: Market capitalization and earnings are in thousands of millions of euros. EPS_t/P_{t-1} and Return are annual simple rates.

Table 3. The comparative model estimated by GMM-sys on the initial sample.

	GMM-SYS – Panel data		
	(i)	(ii)	(iii)
α_0	0.0871	0.0932	0.0873
	[2.08]**	[1.69]*	[1.91]*
α_1			-0.1006
			[-1.18]
α_2		-0.1014	0.2292
		[-1.72]*	[2.68]***
α_3			-0.2796
			[-1.98]**
α_4	0.1245	0.1698	0.2018
	[3.75]***	[1.99]**	[2.49]**
α_5			0.0314
			[0.20]
α_6		-0.2403	0.3293
		[-2.06]**	[1.19]
α_7			-0.7312
			[-2.30]**
Wald	14.10***	23.89***	124.00***
AR(2)	1.371**	1.253**	1.437**
Sargan	97.02***	96.85***	64.95***
Obs.	1255	1255	1255
H_0: $(\alpha_4 + \alpha_5)=0$			4.66 [0.031]**
H_0: $(\alpha_4 + \alpha_6)=0$		4.71 [0.021]**	5.72 [0.017]**
H_0: $(\alpha_4 + \alpha_5 + \alpha_6 + \alpha_7)=0$			5.04 [0.023]**
H_0: $(\alpha_6 + \alpha_7)=0$			9.24 [0.002] ***

Note: This table shows the estimated constant and slope coefficients of model in equation (2) and their HAC t-statistic in brackets computed using Windmeijer (2005). With the t-statistic, *** denotes significance at 1% level, ** denotes significance at 5% level, and * denotes significance at 10% level. The null of AR (2) is that residuals have autocorrelation of order 2. The null of Sargan test is that the instruments are not valid to correct the endogeneity. The Wald test is a test of joint significance of the parameters. Test of significance of slope coefficients sums are reported with their HAC p-values in brackets computed using Windmeijer (2005): *** denotes p <1%, ** denotes p <5%, and * denotes p <10%.

Table 4. The comparative model estimated by OLS on the final sample.

	OLS – Pool data		
	(i)	(ii)	(iii)
α_0	0.0953	0.0972	0.1018
	[11.92]***	[12.10]***	[12.12]***
α_1			-0.0193
			[-2.41]**
α_2		-0.0063	-0.0113
		[-2.10]**	[-2.26]**
α_3			0.0089
			[1.28]
α_4	0.0616	0.0588	0.0429
	[8.80]***	[8.40]***	[3.90]***
α_5			0.0298
			[1.86]*
α_6		-0.0101	0.0062
		[-0.92]	[0.38]
α_7			-0.0299
			[-1.42]
R^2 adjusted	28.23%	28.40%	28.41%
Wald	190.9***	193.8***	213.1***
AR(2)	4.87***	4.83***	4.82***
Obs.	962	962	962
H_0: $(\alpha_4 + \alpha_5)=0$			47.24 [0.000]***
H_0: $(\alpha_4 + \alpha_6)=0$		37.30 [0.000] ***	15.52 [0.000]***
H_0: $(\alpha_4 + \alpha_5 + \alpha_6 + \alpha_7)=0$			26.57 [0.000]***
H_0: $(\alpha_6 + \alpha_7)=0$			0.01 [0.992]

Note: This table shows the estimated constant and slope coefficients of model in equation (2) and, in brackets, the HAC t-statistic computed using Newey and West (1987). With the t-statistic, *** denotes significance at 1% level, ** denotes significance at 5% level, and * denotes significance at 10% level. The null of AR (2) is that residuals have autocorrelation of order 2. The Wald test is a test of joint significance of the parameters. Test of significance of slope coefficients sums are reported with their HAC p-values in brackets computed using Newey and West (1987): *** denotes p <1%, ** denotes p <5%, and * denotes p <10%.

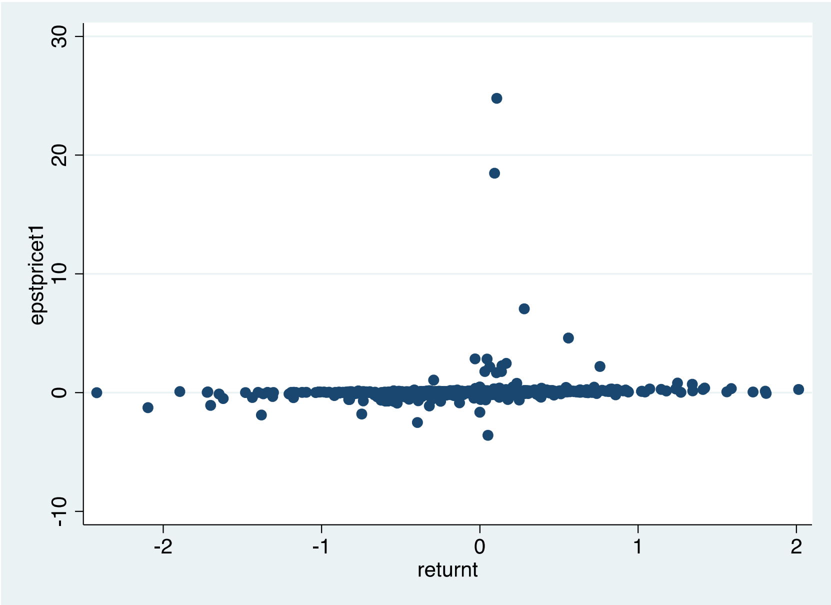
Table 5. The comparative model estimated by GMM-sys (final sample)

	GMM-SYS – Panel data		
	(i)	(ii)	(iii)
α_0	0.0928	0.0891	0.0349
	[8.21]***	[4.30]***	[1.75]*
α_1			0.0245
			[1.06]
α_2		0.0086	0.1961
		[0.36]	[3.50]***
α_3			-0.1617
			[-2.69]***
α_4	0.1728	0.1725	0.1266
	[8.07]***	[3.56]***	[1.94]**
α_5			-0.0803
			[-1.02]
α_6		0.0199	0.633
		[0.22]	[4.01]***
α_7			-0.5833
			[-3.52]***
Wald	65.15***	61.84***	33.68**
AR(2)	1.233**	1.014**	0.4636***
Sargan	33.69***	32.89***	13.03***
Obs.	962	962	962
H_0: $(\alpha_4 + \alpha_5)=0$			1.12 [0.29]
H_0: $(\alpha_4 + \alpha_6)=0$		8.75 [0.003] ***	18.16 [0.000]***
H_0: $(\alpha_4 + \alpha_5 + \alpha_6 + \alpha_7)=0$			5.08 [0.024] **
H_0: $(\alpha_6 + \alpha_7)=0$			12.70 [0.000]***

Note: This table shows the estimated constant and slope coefficients of model in equation (2) and their HAC t-statistic in brackets computed using Windmeijer (2005). With the t-statistic, *** denotes significance at 1% level, ** denotes significance at 5% level, and * denotes significance at 10% level. The null of AR (2) is that residuals have autocorrelation of order 2. The null of Sargan test is that the instruments are not valid to correct the endogeneity. The Wald test is a test of joint significance of the parameters. Test of significance of slope coefficients sums are reported with their HAC p-values in brackets computed using Windmeijer (2005): *** denotes p <1%, ** denotes p <5%, and * denotes p <10%.

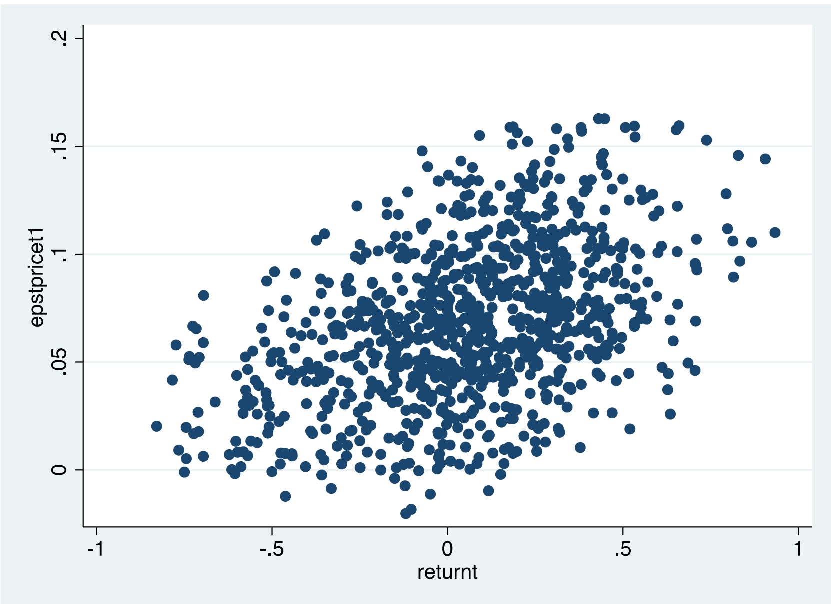
Figure 1. Whole sample period: 1995 – 2012.

1.A. Full sample



Note: epstprice1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.

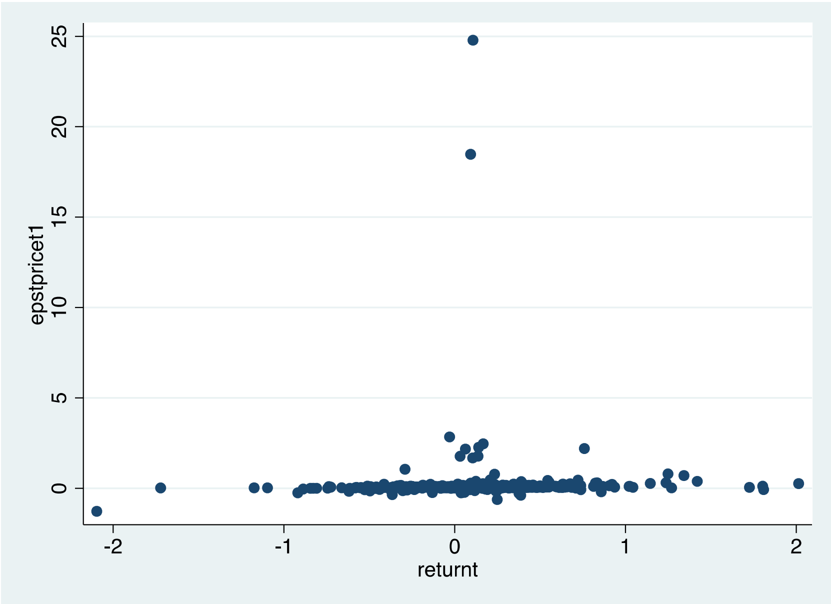
1.B. Sample without outliers



Note: epstprice1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.

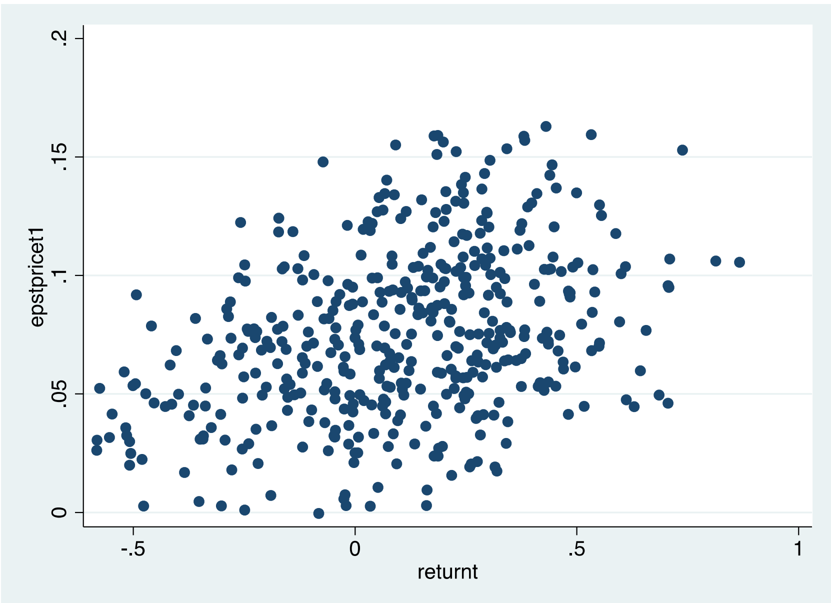
Figure 2. Subsample period pre-IFRS: 1995 – 2004.

2.A. Full subsample



Note: epstpricet1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.

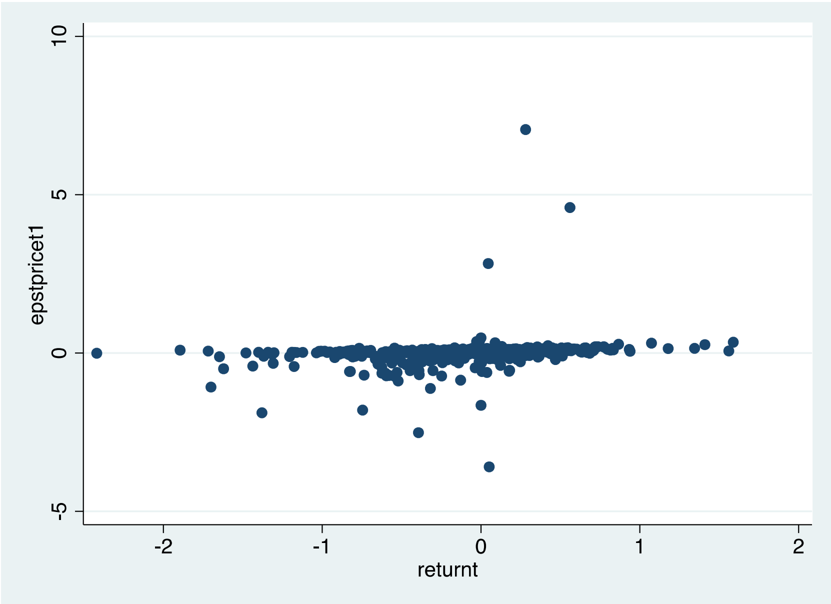
2.B. Subsample without outliers



Note: epstpricet1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.

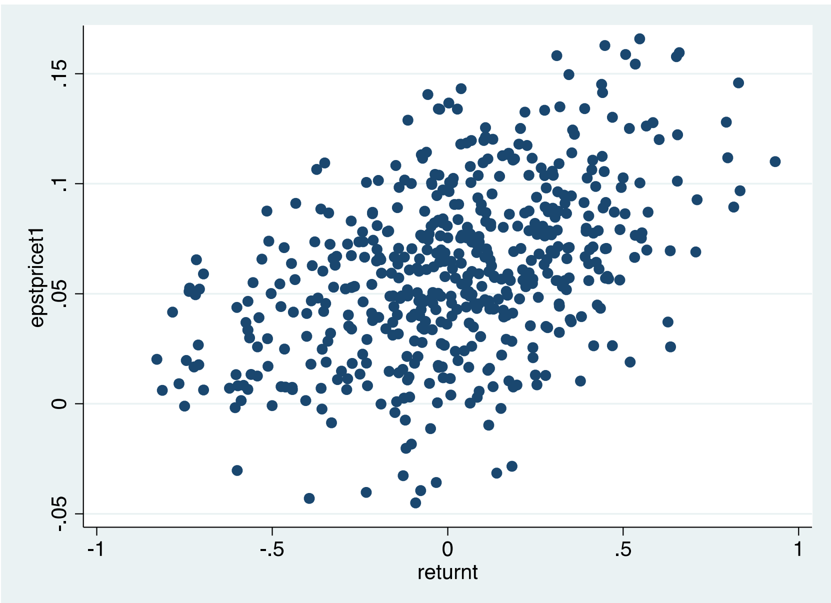
Figure 3. Subsample period post-IFRS: 2005 – 2012.

3.A. Full subsample



Note: epstpricet1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.

3.B. Subsample without outliers



Note: epstpricet1 is the label for the ratio of earnings per share of the period over the share price at the beginning of the period. Returns are in percentage.