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**UNEQUAL IMPACT OF CONSERVATISM ON ACCRUAL MEASURES AND
DRIVERS: IMPLICATIONS FOR THE SPECIFICATION OF ACCRUAL
MODELS**

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Abstract:

This study makes two main contributions to the literature. Firstly, it tests empirically the relative timeliness of accrual measures and earnings components used as explanatory variables in accrual models (“accrual drivers”) regarding the impact of conservatism. Secondly, taking into account the empirical evidence on such a timeliness, it discusses intuitively potential implications for the specification of (traditional) accrual models and the quality of discretionary accrual estimates. It concludes that common accrual models, as Jones (1991), are misspecified. They have a dependent variable (accruals) asymmetrically affected by conservatism, and one or more explanatory variables that are not affected, inducing a non-systematic measurement error in estimating discretionary accruals.

Keywords: accruals; accrual models; discretionary accruals; conservatism.

JEL: M41, C21.

1. Introduction

In this study we test empirically the relative timeliness of accrual measures and earnings components used as explanatory variables in accrual models (“accrual drivers”) regarding the impact of conservatism. In the light of the empirical evidence on such timeliness we next discuss intuitively potential implications for the specification of (traditional) accrual models and the quality of discretionary accrual estimates.

The conservatism principle relates to the prudence managers have to use in recording expected gains and losses, adopting an asymmetric treatment of these earnings components that is more stringent for the latter relative to the former. Expected losses (bad news, BN) have to be recognised immediately after they become expected, while expected gains (good news, GN) shall be recognised when they become realisable/realised only. For example, the expectation that a customer’s debt will not be received (“bad debt”) implies that accounting shall recognise immediately such a loss (a BN). Conversely, a bad debt already recorded as such that is expected to be total or partly recovered (a GN) shall not be recognised until the receipt is realised. Thus, BN have higher timeliness than GN, and the impact of conservatism over accruals/earnings is negative.

The evidence available in the literature, e.g. Basu (1997) and Ball and Shivakumar (2006), shows that the impact of conservatism is reflected on accruals (ACC), consistent with the intuition (and evidence) that cash flows are originated on a realisation basis and thus are not contemporaneously affected by conservatism. However, so far the literature misses specific empirical evidence on how conservatism affects the timeliness of earnings components commonly used as accrual drivers.

Accrual models play a central role in accounting empirical research, mainly in its earnings management branch. Nevertheless, it is widely accepted in the literature that the available aggregate accrual models do not work well in identifying earnings management practices. The models are misspecified and their power is very low (Dechow et al., 1995); they are imprecise in estimating abnormal (discretionary) accruals (Guay et al., 1996); a systematic error related to factors as growth, cash flow, leverage and earnings smoothing is documented in such accruals estimates (Young, 1999); and all of them tend to perform poorly in terms of forecasting accuracy (Thomas and Zhang, 2000). All these caveats seem to be enough motivation to foster research leading to a better understanding of such models and the quality of their estimates. The current study builds on such a motivation. It seeks empirical evidence on conservatism induced timeliness of accrual measures and accrual drivers. Our intuition is that these drivers are originated on a realisation basis and thus are not contemporaneously affected by conservatism, in contrast with the asymmetric timeliness of aggregate accruals.

The empirical evidence in this paper supports such intuition. The main implication of the differentiated impact of conservatism on earnings components is that accrual models commonly used in the literature, as Jones (1991), are misspecified. They have a dependent variable (accruals) asymmetrically affected by conservatism, and one or more explanatory variables that are not affected at all, inducing a non-systematic measurement error in estimating discretionary accruals. Given the prominent role accrual models still play in accounting research, this result is of importance to researchers.

The study proceeds as follows. In the next section we discuss the literature and develop the testing hypothesis. In section 3 we discuss the research design and in section 4 the sample selection. In

section 5 we discuss the empirical results and in section the potential implications for the specification of accrual models. Finally, in section 7, we summarise the main results and draw a conclusion.

2. An overview of the literature and development of the testing hypothesis

The Jones (1991) model is intended to estimate the portion of accruals that managers intentionally used to achieve some pre-determined level of reported earnings (“discretionary accruals”). Although it has many caveats, as we mentioned previously, this model still has a leading role in the literature, being one of the most used in empirical research (e.g. Peasnell et al., 2000). There is not yet alternative models able to overcome its limitations and, simultaneously, easy to use. Most of the other available solutions are based upon Jones (1991) model, or may be reconcilable with it. Thus, for the purpose of the current research, and with no loss of precision or generality, we take the “family” of models that fits under the “umbrella” of that model as the benchmark.

The structure of an accrual model of the type Jones (1991) is based on a single linear equation of the form

$$(1) ACC_{it} = \alpha_0 + \alpha_1 Y_{it} + \varepsilon_{it},$$

where ACC is an aggregate measure of accruals, Y is a vector with one or more earnings components (“accrual drivers”, for example “revenue”) aiming to explain the dependent variable, ε is the residual of the regression, α_0 and α_1 are parameters, t designates the specific period, and i relates to the firm (e.g. Jones, 1991; Peasnell et al., 2000).¹

Amongst the drivers most commonly included in accrual models one has revenue and cash received (Peasnell et al., 2000), change in sales (Jones, 1991), and expenses (Kang and Sivaramakrishnan, 1995). Common to these drivers is the fact that they are expected to be recognised in accounting according to the realisation principle. This means that at the moment of their occurrence there is no uncertainty about their amounts and they are not expected to be (asymmetrically) affected by conservatism.

Let us return to the example presented above on a bad debt. When such bad news is known accounting has to recognise the amount of the expected loss (bad news) through a provision for bad debt. Therefore, in the period of the event accruals are (negatively) affected, contrasting with revenue, sales, change in sales or expenses that are not expected to be affected. In the case of good news, neither accruals nor the drivers are expected to be affected.

This expected outcome is consistent with the asymmetric treatment of gains and losses behind the conservatism principle. Losses (BN) have to be recognised immediately after they become expected, while gains (GN) shall be recognised when they become realisable/realised only. It is consistent too with the empirical evidence available in the literature (e.g. Basu, 1997, Pope and Walker, 1999, Ball et al., 2000, amongst others) showing that the asymmetric effect of conservatism impacts earnings exclusively through accruals.²

¹ Eventually Y may also contain a balance sheet variable. For instance, Plant, Property and Equipment used in the original Jones (1991) model. Usually the use of a balance sheet variable, aiming to explain the long-term accrual Depreciation, implies the use of total accruals as the dependent variable of the model.

² Because of BN connection to future events the impact of such type of news will affect not only current but also long-term accruals.

Taking into account the intuition discussed above and the empirical evidence available in the literature, we expect the dependent variable in equation (1) to be contemporaneously (and asymmetrically) affected by conservatism, and no (asymmetric) impact on the accrual drivers. We state this expectation in the following hypothesis:

H1: *The asymmetric timeliness of good and bad news is expected to hold for accrual measures, but not for accrual drivers (earnings components) usually used as independent variables in accrual models.*

In the following section we discuss the research design underlying the empirical testing of this hypothesis.

3. Research design

a. *The timeliness of earnings components*

To test for the impact of conservative accounting over earnings components (accrual drivers) we adopt an adjusted version of the solution proposed in Pope and Walker (1999),

$$(2) \frac{X_t}{P_{t-4}} = \alpha_1 + \sum_{\tau=0}^3 \alpha_{\tau} D1_{t-\tau} + \sum_{\tau=0}^3 \omega_{\tau} RET_{t-\tau} + \sum_{\tau=0}^3 \rho_{\tau} RET_{t-\tau} \cdot D1_{t-\tau} + u_t,$$

where X is, one at a time, each of earnings components, P is *Compustat* fiscal-year-end closing price, $RET_{t-\tau} = \frac{P_{t-\tau} - P_{t-\tau-1}}{P_{t-4}}$ and $D1_{t-\tau} = 1$ if $RET_{t-\tau} < 0$, zero otherwise.³ This solution is consistent with

Basu (1997) and his definition of earnings conservatism, and tests for the contemporaneous effect of (market) news on the timeliness of earnings components. Moreover, it has the advantage of allowing control for the impact of prior periods.⁴

ω is the coefficient on good news. As discussed in Pope and Walker (1999), it is predicted to be positive and its size is influenced by the speed at which those news are recognised in earnings. The sum of the coefficients ω and ρ reflects the responsiveness of earnings to bad news. The asymmetric impact of conservatism on earnings implies ρ to be positive, consistent with the negative effect of bad news on accruals.

The variable X is, one at a time, the components used as accrual drivers in some of the most common models (change in revenue, revenue, cash received and expenses), three definitions of accruals (working capital accruals, total accruals minus depreciation, and long term operating accruals minus depreciation), and earnings before extraordinary items and discontinued operations.

³ This model differs from the one in Pope and Walker (1999) by including a dummy variable (D1) for each of the controlling periods. Moreover, the definition we use includes dividends. Performing the analysis for the original model does not affect materially the results.

⁴ The choice of this model to test the asymmetric impact of conservatism over accrual measures and accrual drivers, instead of a model that did not contain control for prior periods, was intended to collect “the best of two worlds”: on the one hand, to test for the current period impact (our primary objective); on the other hand, to have a perception how prior periods impact the current one, in some cases for reasons other than conservatism effects.

b. Variables definition and measurement

i) Accruals

We use three definitions of aggregate accruals. They are available in Exhibit 1. Whenever possible, their estimation follows the cash flow approach (Hribar and Collins, 2002). Total accruals (TACC) is defined with no depreciation charge. There are three main reasons for the exclusion of this expense. Firstly, income statement Depreciation tends to reflect normal depreciation only. Secondly, because accrual models that use total accruals (inclusive of depreciation charge) have to control for the source of depreciation.⁵ Thirdly, the visibility and predictability of the depreciation charge make it of limited usefulness to be used in managing earnings (e.g. Peasnell et al., 2000).

ii) Accrual drivers

The accrual drivers considered in the analysis have been selected from the models in Peasnell et al. (2000), revenue and cash received, Jones (1991), change in revenue, and Kang and Sivaramakrishnan (1995), expenses. Exhibit 1 contains their definitions.

iii) Conservatism good and bad news

We use market returns (RET) as a proxy for information on conservatism. It follows from the testing model adopted from Pope and Walker (1999), Ball and Shivakumar (2006) and the seminal work of Basu (1997). Our choice cannot be separated from the fact that only a few proxies for good/bad news are available in the literature, most of them related to very specific research designs which preclude their consideration in the current study (e.g. Guo and Ziebart, 2000; Ball and Shivakumar, 2005).⁶ A dummy variable $D1_t$ that takes value one when $RET_t < 0$ (bad news), zero otherwise, is used as a proxy for good/bad news.

4. Sample selection and descriptive statistics

Table 1 describes the sample selection. From the 1999 version of *Compustat Primary, Secondary and Tertiary, Full Coverage and Research Annual Industrial* files we collected all firms. Because prior to 1987 cash flow from operations (#308) disclosed in the cash flow statement (SFAS 95) is unavailable, after lagging variables the sample is defined for the period 1988-1998.⁷ As in Barth et al. (2001), a different structure of accruals justifies the exclusion of firms belonging to financial industries. This set of procedures originated a raw sample with 85,384 firm-years. Variables are all deflated by the fourth lag of market value, consistent with the solution in Pope and Walker (1999).⁸ After deleting missing observations and trimming extreme ones 1 percent top and bottom (e.g. Barth et al., 1998) the sample has 27,949 firm-years.⁹

⁵ For example, by using a balance sheet variable as Property, Plant and Equipment. According to Young (1999) this type of models tends to produce discretionary accrual estimates with a larger measurement error.

⁶ The use of this proxy in reverse price-earnings relations is not exempt of criticism. However, Moreira (2002: Part II, Appendix B) discusses and defends its use.

⁷ Because of the role cash flow plays in the estimation of accruals, we decided not to mix balance sheet and SFAS 95-cash-flow-data measures of this variable. We tried to avoid potential measurement errors arising from using the balance sheet measure (Hribar and Collins, 2002).

⁸ We also used a one lag market value in testing for the current period. The results are qualitatively the same.

⁹ Performing the analysis for the non-trimmed sample does not affect materially the results.

Table 2, Panel A, contains some basic descriptive statistics for both samples. Earnings (EBEI) is slightly skewed to the left, consistent with the evidence in the literature that during the period firms have been reporting increasing losses. However, the mean and median are both positive. Conversely, the mean of TACC_D is negative, and the median is close to zero. This situation shows some left skewness, consistent with the asymmetric conservative recognition of unrealised economic losses and gains (Ball and Shivakumar, 2005) and common to the samples of other related studies (e.g. Barth et al., 1999; Thomas and Zhang, 2000). As expected, the change in revenue (Δ REV) and returns (RET_0) show some right skewness.

Panel B displays the correlations amongst the main variables. The highest correlations appear in variables that are strongly related in accounting terms as cash received (CR) / REV / expenses (EXP). All of them have a correlation close to 100 percent. Accrual measures (TACC_D, LTACC_D and WCA) do have also high correlation that in some cases surpasses 60 percent. The correlation of RET_0 with the other variables is fairly small and tends not to surpass 17 percent. It is even smaller (around 8 percent) for TACC_D. The correlation of Δ REV with this variable is fairly low.

The (untabulated) structure of the sample follows our expectations and the evidence from other studies. As in Givoly and Hayn (2000), the number of observations is increasing throughout the period, evolving smoothly from 7.5 percent in 1988 up to 10 percent in 1998.

In the following section we discuss the main results of the analysis.

5. Empirical results: relative timeliness of accruals and accrual drivers

Table 3 displays the impact of good (GN) and bad news (BN) on earnings, accrual measures, and accrual drivers.¹⁰ The evidence it reports is intended to support the discussion above on the relative timeliness of aggregate accrual measures and accrual drivers. We use an adjusted version of a model from Pope and Walker (1999) that tests the speed at which prior period news are recognised in earnings. It controls for the impact of prior period news, and uses market returns as a proxy for news.¹¹ Because the evidence from pooled regressions (Panel A) is very similar to that using separate-year regressions (Panel B) we only discuss the former.

The numbers reported in the table are the coefficients of the model,¹² and read as it follows. Current period (t) earnings (EBEI, #237) suffer a joint impact of 0.126 per monetary unit of current BN (BN_t), 0.128 per unit of BN_{t-1} , 0.119 per unit of BN_{t-2} and 0.111 per unit of BN_{t-3} . This preliminary evidence is consistent with the literature and suggests that the impact of market news affects earnings up to three periods later, reflecting the delay of accounting in recognizing news.

¹⁰ The equations in this table have been regressed by OLS (Ordinary Least Squares). The set of equations is equivalent to a seemingly unrelated regressions model, due to the correlation of the residuals in such equations. Because the explanatory variables are the same in all equations then OLS and GLS (Generalised Least Squares) are identical ways of estimating them (Green, 2000:616).

¹¹ Performing the analysis using industry-based abnormal returns does not change qualitatively the results.

¹² For the sake of parsimony, we do not report the coefficients α . Gnews (GN) and Bnews (BN) coefficients are, respectively, ω and $(\omega+\rho)$. To check each period asymmetrical impact on the dependent variables columns G=B make available the results of a statistical test of differences in coefficients (* and ** stands for significance at less than 1 and 5 percent, respectively; = stands for coefficients not statistically different from each other; bold numbers are not statistically different from zero). Exhibit 2 summarises the set of significance tests we performed.

Looking still over EBEI, in all the periods the impact is statistically larger for BN than for GN, at less than one percent, consistent with the asymmetric impact of conservatism (for example, for current period, 0.017 and 0.126, for GN and BN respectively). This means that the timeliness of BN is greater than that of GN. Given that the proxy for BN is defined in negative terms, the sign of its coefficients is in line with expectations. Hence, this type of news makes earnings more negative, or less positive, relative to a situation where news are all good. As argued in Pope and Walker (1999), the coefficient of GN is expected to increase as the lag increases, reflecting the effective occurrence of the operations underlying this type of news. The coefficient shifts sharply from period t to period $t-1$ (0.017 to 0.06), consistent with GN being reflected in earnings (accruals) with one lag, and become quite stable after this last period. Contrastingly, the coefficient on BN is expected to decrease as the lag increases, as the effect of prior news vanishes.¹³ The evidence in the table follows the one in the literature, and supports the intuition that BN is recognised in earnings at a higher speed than GN. These results for EBEI follow closely those of the US sample in Pope and Walker (1999), and are also consistent with the evidence in Basu (1997).

The evolution of the coefficient for TACC_D follows more or less closely that mentioned for EBEI, except that for prior periods there is no asymmetric impact and the coefficients for GN and BN tend to be statistically equal. This is consistent with the immediate effect of conservatism being translated into a contemporaneous asymmetric impact on accruals, but having indirect future impact on cash flows that can be potentially related to delayed recognition of BN. Such evolution fits thus the expectations, namely in showing no current impact for GN,¹⁴ consistent with this type of news not having contemporaneous impact on earnings (accruals). The coefficients on LTACC_D for the pooled regression are broadly consistent with the expectation discussed above that conservatism impacts long term accruals also. Hence, these results provide strong evidence that contemporaneous accrual measures are asymmetrically affected regarding the type of news, consistent with the definition of conservatism discussed above and with the intuition underlying the testing hypothesis.

The evidence reported in Table 3 for the accrual drivers (Δ REV, REV, CR, EXP), usually used as explanatory variables in accrual models, shows a different picture from the one discussed for EBEI and accrual measures. The impact of news on the drivers tends to be symmetrical, the coefficients on GN and BN being not statistically different at conventional levels of confidence. Thus, this evidence is supportive of the intuition discussed above that accrual drivers tend to be originated on a realisation basis and are not expected to be (asymmetrically) affected by conservatism. The size of the coefficients on these variables tends to increase with the lag. For instance, the coefficients for REV are 0.439/0.543 for GN/BN and period t , 0.847/1.037 in period $t-3$ (the exception to this trend is a slight decrease on GN coefficient from period $t-2$ to $t-3$). These results are consistent with the evidence in Kothari (1992) about prices leading earnings up to three periods. Focusing the analysis strictly in the current period, i.e. performing the tests with no control for prior periods and using one lag market value as the deflator, the (untabulated) results are similar to those discussed.

The evidence in this table is summarised in Exhibit 2. It strongly supports the testing hypothesis and its underlying intuition that the asymmetric impact of conservatism (GN/BN) holds only for accrual measures, not for the accrual drivers usually used as explanatory variables in accrual models. This

¹³ This expectation follows the assumption in Pope and Walker (1999) model that there may be delayed recognition of BN. The empirical evidence in the tables is consistent with such delay being reflected in future cash flows. However, such evidence is also consistent with the existence of information in the proxy we use (returns) that is not necessarily related to conservatism.

¹⁴ Boldface numbers are not statistically different from zero at less than 5 percent.

evidence suggests then that these models are misspecified and their estimates may contain a measurement error. We discuss this issue in the next section.

6. Unequal timeliness for aggregate accrual measures and accrual drivers: implications for the specification of accrual models.

a. *The specification of accrual models*

Let us recall the structure of an accrual model of the type Jones (1991) presented above as equation (1):

$$ACC_{it} = \alpha_0 + \alpha_1 Y_{it} + \varepsilon_{it},$$

where ACC is an aggregate measure of accruals, Y is a vector with one or more accrual drivers (for instance, revenue) aiming to explain the dependent variable, ε is the residual of the regression. Its parameters (α) can be estimated regressing the model for a given firm using time-series data or, as it is currently more common, cross-sectionally for an industry. Using them it is then possible to have an estimate of the expected (normal) accruals conditional on the realised values of Y in period t:

$$(3) \hat{ACC}_{it} = \hat{\alpha}_0 + \hat{\alpha}_1 Y_{it}.$$

An estimate of discretionary (abnormal) accruals ($\hat{\varepsilon}$) is given by:

$$(4) ACC_{it} - \hat{ACC}_{it} = \hat{\varepsilon}_{it} = DAC_{it}.^{15}$$

Behind this simple way of estimating DAC there are two main assumptions that may potentially affect the quality of the estimates. Firstly, Y is assumed not to be affected by managers' discretionary actions.¹⁶ Otherwise, the estimated coefficients ($\hat{\alpha}_1$) would be biased and inherently the same would happen to the accruals estimates (e.g. Dechow et al., 1995). Secondly, it is assumed that omitted variables are uncorrelated with the explanatory variables in the model. If this does not happen the estimation suffers from an omitted-variables-problem, and the coefficients will be biased (Dechow et al., 1995; Greene, 2000).

Let us concentrate on the latter assumption. The evidence discussed in the previous section shows that the timeliness of ACC regarding good and bad news is asymmetric. Conversely, the type of news does not imply differentiated timeliness for accrual drivers (Y). The right hand side of equation (1) misses then a variable controlling for such asymmetric impact. However, because this missing variable is not correlated to Y there is not an omitted-variable-problem and the coefficients (α_1) are expected to be unbiased. Despite this positive outcome DAC estimates might contain a measurement error.

b. *The expected measurement error contained in DAC estimates*

Taking into account managers' interventions over ACC we split this variable into two components as it follows: a discretionary component (DAC), related to managers' intentional interventions towards earnings management; a non-discretionary one (NDAC), related to firms' normal business activity. It can then be written, for a given period:¹⁷

$$(5) \quad ACC = NDAC + DAC.$$

¹⁵ If the model is estimated in time-series, DAC is the residual of the regression. Otherwise, when estimated cross-sectionally by industry, DAC can be understood as a forecast error.

¹⁶ Models using instrumental variables are supposed not to invoke this assumption. Nevertheless, it is not sure that they may overcome the problem completely.

¹⁷ For the sake of simplicity and without loss of generality or precision, we drop the subscripts for firm/time (it).

Because of its character, NDAC can be written as a function f that relates this component positively to the drivers of normal accruals, for example sales, and negatively to the impact of bad news that related to the conservatism principle embodied in the general accepted accounting principles (GAAP).¹⁸ This is,

$$(6) \quad NDAC = f(\text{normal accrual drivers}; \text{GAAP conservatism}).$$

The impact of conservatism on accruals is asymmetric regarding the type of news. BN impacts accruals negatively, and GN tends to have no impact on them. Conversely, as the evidence discussed above shows, the impact of news on accrual drivers tends to be symmetrical.

Re-writing expression (1) after adjusting it for equations (5) and (6) allows a perception of the impact of conservatism on accrual models. Expression (1) becomes:

$$(1') \quad NDAC [f(\text{accrual drivers}; \text{conservatism})] + DAC = \\ = \alpha_0 + \alpha_1 Y [\text{accrual drivers}] + \varepsilon.$$

Let us discuss this specification issue based upon the measurement error that may flow to DAC estimates from a lack of control for conservatism. If there is no specific control for conservatism on the right hand side of that expression, and because accrual drivers are expected to be independent from conservatism effects, then the intercept and the error term tend to pick up such effects. DAC estimates are thus expected to contain a measurement error.¹⁹ Moreover, this error is different regarding the type of news. The intercept of the equation is expected to be higher for firms having GN relative to those having BN, consistent with the depressive impact of the latter on accruals. When firms have over time both type of news (potentially the most frequent case), or when the model is estimated cross-sectionally by industry, one may expect that with no control for conservatism the size of the intercept will be somewhere in between the extreme cases characterised by having only one type of news. Let us call this intercept the “average intercept”. Given the asymmetric impact of conservatism on accruals, we expect this intercept to be underestimated for GN firms and overestimated for BN ones. Looking over equations (3) and (4) the implications arising for the estimation of DAC are easy to predict. For GN firms the estimate of normal accruals tends to be smaller than it should and DAC estimates are expected to be overstated. Contrastingly, for BN firms DAC estimates are expected to be understated. Based on these expectations we predict that such error is positive (negative) for good (bad) news firms.²⁰ This means that the error is not systematic, reflecting the asymmetric impact of conservatism.

In sum, the discussion in the current section gives support to the intuition that accrual models are misspecified and DAC estimates do contain a non-systematic measurement error. Further research is needed to collect evidence intended to test empirically for this intuition.

¹⁸ E.g. Jones (1991); Basu (1997); Peasnell et al. (2000).

¹⁹ If there are uncorrelated omitted variables then the coefficients of the explanatory variables will be unbiased, but the intercept will pick up the mean effect of those omitted variables.

²⁰ We define the measurement error (ME) as the difference between DAC estimates produced by a model with no control (NC) for conservatism and DAC estimates of a model having such a control (C), this is, $ME = DAC_{NC} - DAC_C$.

7. Conclusion

In this study we test empirically the relative timeliness of accrual measures and drivers used as explanatory variables in accrual models, regarding the impact of conservatism. In the light of the empirical evidence on such timeliness we discuss potential implications for the specification of (traditional) accrual models and the quality of accrual estimates.

The underlying intuition is that accrual drivers, in the right hand side of the models, are independent of conservative accounting effects, but the dependent variable, an accrual measure, is not. The empirical evidence supports completely this intuition. Accrual measures are asymmetrically affected by conservatism, showing higher timeliness for BN relative to GN. Conversely, accrual drivers show a symmetrical impact regarding the type of news.

This evidence has implications for the specification of accrual models. When models do not contain control for conservatism DAC estimates contain a measurement error. For GN firms DAC estimates are expected to be overstated, understated for BN. This means that the error is not systematic and reflects the asymmetric impact of conservatism on accrual measures.

Thus, our results give support to the intuition that (traditional) accrual models are misspecified, lacking, at least, explanatory variables controlling for conservatism. This conclusion is consistent with Healy's (1996) suggestion that future research should include the impact of conservatism in accrual models. Further research is needed to test empirically such intuition.

The evidence in this study, namely that on the timeliness of accrual drivers and its implications for the specification of accrual models, is of importance for accounting researchers. We expect it to allow a better perception of the insufficiencies of these models and, most especially, to foster research intending to define more powerful and accurate ones.

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References

- BALL, R. and L. SHIVAKUMAR 2005. "Earnings quality in U. K. private firms: comparative loss recognition timeliness". *Journal of Accounting and Economics*, vol. 39, pp. 83-128.
- _____ 2006. "The Role of Accruals in Asymmetrically Timely Gain and Loss Recognition". *Journal of Accounting Research*, vol. 44, n. 2, pp. 207-242.
- _____ and S. KOTHARI, and A. ROBIN 2000. "The effect of institutional factors on properties of accounting earnings: international evidence". *Journal of Accounting and Economics*, v. 29, pp. 1-51.
- BARTH, M., W. BEAVER, and W. LANSDMAN 1998. "Relative Valuation Roles of Equity Book Value and Net Income as a Function of Financial Health". *Journal of Accounting and Economics*, v.25, pp. 1-34.
- _____, W. BEAVER, J. HAND, and W. LANSDMAN 1999. "Accruals, Cash flow, and Equity Values". *Review of Accounting Studies*, v.3, pp. 205-229.
- _____, R. KASZNIK, and M. MCNICHOLS 2001. "Analysts coverage and intangible assets". *Journal of Accounting Research*, v. 39, n.1, pp. 1-34.
- BASU, S. 1997. "The conservatism principle and the asymmetric timeliness of earnings". *Journal of Accounting and Economics*, v. 24, pp. 3-37.
- DECHOW, P., R. SLOAN, and A. SWEENEY 1995. "Detecting earnings management". *The Accounting Review*, v. 70, n. 2, April, pp. 193-225.
- FAMA, E. and J. MACBETH 1973. "Risk, Return, and Equilibrium". *The Journal of Political Economy*, v. 81, n. 3, pp. 607-636.
- GIVOLY, D. and C. HAYN 2000. "The changing time-series properties of earnings, cash flows and accruals: Has financial reporting become more conservative?". *Journal of Accounting and Economics*, v. 29, pp. 287-320.
- GREEN, W., 2000. *Econometric Analysis*, Prentice Hall: New Jersey, USA, 4th Ed.
- GUAY, W., S. KOTHARI, and R. WATTS 1996. "A market-based evaluation of discretionary accrual models". *Journal of Accounting Research*, v. 34, Supplement, pp. 83-105.
- GUO, H. and D. ZIEBART 2000. "The effects of earnings management, inside information, and voluntary disclosure choice on the accuracy of management earnings forecasts". *Asia-Pacific Journal of Accounting and Economics*, v. 7, pp. 37-58.
- HEALY., P. 1996. "Discussion of 'A market-based evaluation of discretionary accrual models'". *Journal of Accounting Research*, v.34, Suppl., pp. 107-115.
- HRIBAR, P. and D. COLLINS 2002. "Errors in Estimating Accruals: Implications for Empirical Research". *Journal of Accounting Research*, v. 40, n. 1, pp. 102-134.
- JONES, J. 1991. "Earnings management during import relief investigations". *Journal of Accounting Research*, v. 29, n. 2, 193-228.
- KANG, S. and K. SIVARAMAKRISHNAN 1995. "Issues in testing earnings management and an instrumental variable approach". *Journal of Accounting Research*, v. 33, n. 2, Autumn, pp. 353-367.
- KOTHARI, S. 1992. "Price-Earnings Regressions in the Presence of Prices Leading Earnings". *Journal of Accounting and Economics*, v. 15, pp. 173-202.
- MOREIRA, J., 2002. *Essays in links between Firm Value and Earnings Components Under Conservative Accounting*. PhD dissertation, Lancaster University, January.

- PEASNELL, K., P. POPE, and S. YOUNG 2000. "Detecting earnings management using cross-sectional abnormal accrual models". *Accounting and Business Research*, v.30, n.4, pp. 313-326.
- POPE, P. and M. WALKER 1999. "International differences in the timeliness, conservatism, and classification of earnings". *Journal of Accounting Research*, v. 37, Suppl., pp. 53-87.
- THOMAS, J. and X. ZHANG 2000. "Identifying unexpected accruals: a comparison of current approaches". *Journal Accounting and Public Policy*, v.19, pp. 347-376.
- YOUNG, S. 1999. "Systematic Measurement Error in the Estimation of Discretionary Accruals: An Evaluation of Alternative Modelling Procedures". *Journal of Business Finance & Accounting*, v. 26, n.7-8, Sept./Oct., pp. 833-862.

Table 1: **Sample selection. Period 1988/98**

<i>Description</i>	N. firm-years
<i>COMPUSTAT (1999) Primary, Secondary, and Tertiary, Full Coverage, and Research Annual Industrial Files, after lagging variables and deleting financial industries</i>	85,384
After deleting missing observations	30,670
After trimming one percent top and bottom of all deflated (by the fourth lag of market value) variables	27,949

Table 2: **Descriptive statistics and pair-wise correlations**

Panel A: Descriptive statistics

Variable	MEAN	STD	Q3	MEDIAN	Q1
EBEI	0.019	0.194	0.089	0.041	-0.019
TACC_D	-0.007	0.167	0.039	-0.001	-0.044
LTACC_D	-0.020	0.139	0.010	-0.007	-0.037
WCA	0.014	0.160	0.049	0.006	-0.028
CR	2.136	2.721	2.587	1.283	0.599
REV	2.156	2.745	2.616	1.301	0.606
EXP	1.972	2.591	2.371	1.142	0.511
Δ REV	0.155	0.572	0.237	0.063	-0.018
RET_0	0.063	0.813	0.271	0.016	-0.212

Notes:

- 1) RET are market returns estimated using *Compustat* fiscal-year-end closing price (#199) and dividends per share (#26);
- 2) *RET_0* is current change in prices deflated by the fourth lag of share price. Other variables' definition is per Exhibit 1;
- 3) 27,949 firm-years, deflated by the fourth lag of market value.

Panel B: Correlations: Pearson (above) / Spearman (below) [27,949 firm-years, deflated by the fourth lag of market value]

Variable	TACC_D	LTACC_D	WCA	CR	EXP	REV	RET_0	ΔREV
TACC_D		0.47	0.64	0.06	0.06	0.07	0.08	0.23
LTACC_D	0.36		-0.38	-0.10	-0.10	-0.10	-0.01	-0.17
WCA	0.67	-0.26		0.15	0.15	0.17	0.09	0.39
CR	0.07	-0.07	0.11		0.99	0.99	0.10	0.43
EXP	0.07	-0.07	0.11	0.99		0.99	0.08	0.43
REV	0.09	-0.08	0.13	1.00	0.99		0.10	0.45
RET_0	0.09	-0.01	0.10	0.11	0.09	0.12		0.17
Δ REV	0.25	-0.15	0.37	0.35	0.34	0.37	0.22	

Note: variables' definition is per Panel A and Exhibit 1. Bold numbers are not significantly different from zero at less than 5%.

Table 3: Contemporaneous impact of good and bad news on earnings components, controlling for prior periods news

$$\text{Model: } \frac{X_t}{P_{t-4}} = \alpha_1 + \sum_{\tau=0}^3 \alpha_{\tau} D1_{t-\tau} + \sum_{\tau=0}^3 \omega_{\tau} RET_{t-\tau} + \sum_{\tau=0}^3 \rho_{\tau} RET_{t-\tau} \cdot D1_{t-\tau} + u_t$$

Panel A: Pooled regressions (Period 1988/98, 27,949 firm-years)

Variables	Current period (t) news			Period t-1 news			Period t-2 news			Period t-3 news			Adj. R ² (%)
	GNews	Bnews	G=B	Gnews	Bnews	G=B	Gnews	Bnews	G=B	Gnews	Bnews	G=B	
EBEI	0.017	0.126	*	0.060	0.128	*	0.057	0.119	*	0.057	0.111	*	21.1
TACC_D	0.002	0.049	*	0.041	0.055	=	0.024	0.043	**	0.026	0.026	=	5.9
LTACC_D	-0.011	0.010	*	0.001	0.002	=	-0.012	0.012	*	-0.005	0.009	=	1.0
WCA	0.014	0.039	*	0.039	0.052	=	0.036	0.030	=	0.030	0.016	=	7.4
ΔREV	0.138	0.149	=	0.158	0.182	=	0.169	0.173	=	0.149	0.146	=	15.9
REV	0.439	0.543	=	0.739	0.661	=	0.937	0.961	=	0.847	1.037	=	20.9
CR	0.415	0.515	=	0.715	0.628	=	0.910	0.936	=	0.824	1.022	=	20.4
EXP	0.381	0.405	=	0.629	0.500	=	0.827	0.786	=	0.731	0.874	=	19.5

Panel B: Separate-year regressions (Mean values for period 1988/98, 27,949 firm-years)

Variables	Current period (t) news			Period t-1 news			Period t-2 news			Period t-3 news		
	GNews	Bnews	G=B	Gnews	Bnews	G=B	Gnews	Bnews	G=B	Gnews	Bnews	G=B
EBEI	0.023	0.145	*	0.063	0.134	*	0.065	0.121	*	0.064	0.111	*
TACC_D	0.003	0.048	*	0.042	0.058	=	0.027	0.045	=	0.028	0.024	=
LTACC_D	-0.010	0.004	=	-0.005	-0.004	=	-0.014	0.013	*	0.000	0.010	=
WCA	0.014	0.045	*	0.047	0.054	=	0.041	0.032	=	0.027	0.014	=
ΔREV	0.151	0.156	=	0.173	0.176	=	0.182	0.166	=	0.140	0.153	=
REV	0.554	0.485	=	0.679	0.598	=	0.910	0.921	=	0.968	1.141	=
CR	0.528	0.453	=	0.650	0.567	=	0.880	0.897	=	0.950	1.128	=
EXP	0.477	0.328	=	0.566	0.431	=	0.784	0.744	=	0.838	0.976	=

Notes:

- 1) The model is an adjusted version of the solution in Pope and Walker (1999).
- 2) X is, one at a time, each of the variables in the table; P is *Compustat* fiscal-year-end closing price; $RET_{t-\tau} = \frac{P_{t-\tau} - P_{t-\tau-1}}{P_{t-4}}$; $D1_{t-\tau} = 1$ if $RET_{t-\tau} < 0$, zero otherwise;
- 3) Gnews (Bnews) is the coefficient of the proxy for good (bad) news, ω ($\omega + \rho$). Other variables' definitions are per Exhibit 1;
- 4) * (**) means the coefficients are statistically different from each other at less than 1 (5) percent. "=" indicates that the coefficients are not statistically different from each other. Boldface numbers are not statistically different from zero;
- 5) Panel B contains the mean of the yearly coefficients, and the *t* statistics (untabulated) have been estimated using Fama and McBeth (1973) technique;
- 6) The results in each table are controlled for industry and yearly intercept effects (untabulated).

Exhibit 1: Earnings structure and variables' definition

	Variable	Description	Compustat annual codes
±	CFO	Cash flow from operations (1987 onwards)	#308
+	WCA	(non-cash) Working capital accruals	($\Delta\#4-\Delta\#1$)-($\Delta\#5-\Delta\#34-\Delta\#71$)
+	LTACC	Long term operating accruals	#237-#308-WCA
=	TACC	Total accruals	#237-#308
=	TACC_D	Total Accruals minus Depreciation	#237-#308+#14
=	EBEI	Earnings before ext. items disc. operat.	#237
±	CR	Cash received	#12- $\Delta\#151$
+	Δ REC	Change in trade receivables	$\Delta\#151$
=	REV	Revenue (sales)	#12
-	EXP	Expenses (administrative and selling)	#12-#13
-	DEP	Depreciation and amortisation	#14
-	OER	Other expenses net of other revenues	#13-#237-#14
=	EBEI	Earnings before ext. items disc. operat.	#237

Note: *Compustat* codes: #1 (cash and short-term investments); #4 (total current assets); #5 (total current liabilities); #34 (debt in current liabilities); #71 (income taxes payable); #13 (operating income before depreciation).

Exhibit 2: **Relative timeliness of earnings, accrual measures and accrual drivers**

Variables	Good News vs. Bad News			
	<i>Period</i>			
	<i>t</i>	<i>t-1</i>	<i>t-2</i>	<i>t-3</i>
EBEI	<	<	<	<
TACC_D	<	=	<	=
LTACC_D	<	=	<	=
WCA	<	=	=	=
ΔREV	=	=	=	=
REV	=	=	=	=
CR	=	=	=	=
EXP	=	=	=	=

Notes:

- 1) This table shows the relative timeliness of earnings and earnings components, and is based on Table 3, panel A;
- 2) Variables' definition is per Table 2 and Exhibit 1;
- 3) "<" means the variable shows asymmetric timeliness, higher for Bad News and significant at less than 5%. "=" means there is no significant difference in timeliness for Good and Bad News.