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THE FINANCIAL REPORTING QUALITY EFFECT ON EUROPEAN FIRM PERFORMANCE

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The financial reporting quality effect on European firm performance

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Abstract: This paper analyses whether accounting quality produces any impact on firm performance using only accounting data: the abnormal accruals methodology to evaluate accounting quality and ROA to determine firm performance. This is important because accounting information guides investment decisions (Bradshaw *et al.*, 2004 and Verdi, 2006). For 17 European countries, findings confirm the mechanical relationship between accruals and accounting measures of performance: income increasing abnormal accruals, which mean decreasing accounting quality, will increase ROA and vice-versa. In addition, the lag effect is analysed, as per Chan *et al.* (2004). When current performance is compared with the abnormal accruals of the previous year, results suggest that the reverse effect does not occur for two consecutive years.

JEL classification: M41- Accounting

Key words: Accounting quality; firm performance; abnormal accruals.

Introduction

Financial reports are an essential source of information for the decision-making processes of economic agents. Investors decide whether to purchase stocks by analysing a firm's financial reports. Fields, Lys and Vicent (2001) stated that accounting reports are needed because capital markets are not strong-form efficient.

Even in international capital movements, financial reports are crucial (Bradshaw *et al.*, 2004 and Gelos and Wey, 2005). Creditors decide whether to lend or not and establish contractual terms, namely interest rates, considering accounting figures, as shown by Gopalakrishan (1994) and Beatty and Weber (2003).

Thus, accounting quality is of great concern. Bharath, Sunder and Sunder (2008) argued that poor accounting quality will make it harder to estimate a firm's ability to repay debt and to pay dividends. By contrast, higher accounting quality reduces financial information asymmetry by increasing investment efficiency (Verdi, 2006), and by earnings being more representative of future cash flows (Garcia-Teruel Martinez-Solano, and Sanchez-Ballesta, 2009). Regarding a firm's performance in the capital markets, Christie and Zimmerman (1994) indicated that an accounting choice is efficient when it maximizes the firm's value and that this efficiency varies across industries and years.

This paper's contribution is to test the relationship between accounting quality and firm performance using only accounting information: for firm performance we use two accounting ratios: Return on Assets (ROA) and Return on Equity (ROE), which are easily calculated and allow us to compare firms of different sizes. For earnings quality, we chose the abnormal accruals methodology for two reasons: a) data collection, because some countries in the sample did not issue cash flows in all periods considered; b) abnormal accruals have been extensively used in literature as a proxy of accounting quality (Warfield *et al.*, 1995; Larcker and Richardson, 2004, Verdi, 2006; Garcia-Teruel *et al.*, 2009). A further contribution is the broad sample of 40 sectors in 17 European countries, and the lengthy ten-year period of analysis.

The remainder of this paper proceeds as follows. The first section presents the hypotheses and a review of extant literature. In the second section, the data and methodology are identified for the empirical work. The econometric models and the variables are defined and several statistics are also included. The third section contains the results of the empirical tests, which are then analysed. Additional tests are made to verify the robustness of the results

in order to assure that they are not skewed by any statistical problems. The conclusions are in the final section.

Section 1: *Hypotheses and literature review*

When managers consider a change in accounting method, they take into account specific factors of firm, industry and even country. The theory of contracts developed the analysis of the contractual relationship between manager and firm in order to reduce financial information asymmetry. Another possible way to reduce this problem is to improve accounting quality as mentioned by Verdi (2006) and Garcia-Teruel *et al.* (2009). The results of Verdi (2006) showed that the quality of financial reporting, given by abnormal accruals, increases investment efficiency, namely by reducing under- and overinvestment. Bradshaw *et al.* also found evidence that American investors increase their investment in countries that exhibit higher accounting quality, using an accounting conformity ratio to the Generally Accepted Accounting Principles (GAAP). Garcia-Teruel *et al.* (2009) indicated that firms with higher accounting quality, also given by abnormal accruals, hold lower cash levels. In addition, Helwege *et al.* (2007) argued that institutional investors monitor larger firms, therefore information asymmetries are reduced and managers tend to be less inefficient.

Regarding financial structure, Bharath *et al.* (2008) stated that poor accounting quality (estimated by abnormal accruals) makes it harder to estimate a firm's ability to repay debt and to pay dividends.

In this paper, we test the mechanical relationship between earnings and abnormal accruals. As accounting profit figures are comprised of accruals and cash flows, any relationship is expected to be simply mechanical.

As fundamental analysis is employed, two accounting ratios of firm performance are used: ROE and ROA. These ratios are easily obtained and make it possible to compare firms of different sizes. Therefore, the null hypotheses are: income increasing abnormal accruals will increase measures of performance, and income decreasing abnormal accruals will decrease measures of performance.

Equation (1) and (2) are used to test these hypotheses:

$$ROE_{it} = \alpha_1 + \alpha_2 AA^{+}{}_{it} + \alpha_3 (control\,\text{var}\,iables)$$

(1)

$$ROE_{it} = \alpha_1 + \alpha_2 AA^{-}_{it} + \alpha_3 (control\,\text{var}\,iables)$$

(2)

The other approach employed is the lagged effects of AA in ROE. This is because managers make decisions using information of the preceding year. Chan *et al.* (2004) found that future earnings would decrease in the next year, and even more in three years' time with an increase of current accruals. Thus, we have Equation (3):

$$ROE_{it} = \alpha_1 + \alpha_2 AA^{+}_{it-1} + \alpha_3 (control\,\text{var}\,iables)$$

(3)

The model also uses ROA as a dependent variable in order to test whether results are or not driven by the firm's performance proxy.

As in previous research, Abnormal Accruals (AA) is employed as a proxy of accounting quality. This methodology was first introduced by Jones (1991) and modified by Dechow *et al.* (1995) and then used in a large number of studies (e.g. Garcia-Teruel *et al*., 2009, Verdi, 2006, Larcker and Richardson, 2004 and Warfield *et al.*, 1995).

AA is estimated by total accruals regression using the cross-sectional approach. The AA variable contains the residuals of that regression; therefore the AA variable is the part that is not explained by the explanatory variables included (Investment and cash sales):

$$\mathrm{TA}_{\mathrm{it}} = \gamma_1 + \gamma_2 \left(\Delta \mathrm{Sal}_{\mathrm{it}} - \Delta \mathrm{Rec}_{\mathrm{it}}\right) + \gamma_3 \mathrm{PPE}_{\mathrm{it}} + \mathrm{u}_{\mathrm{it}}$$

(4)

Where,

$\mathrm{TA}_{\mathrm{it}}$ Total Accruals computed by equation (4);

$\Delta \mathrm{Sal}_{\mathrm{it}}$: Change in sales for firm i between year t and t-1 (wc01001);

$\Delta \mathrm{Rec}_{\mathrm{it}}$: Change in receivables for firm i between year t and t-1 (wc02051);

$\mathrm{PPE}_{\mathrm{it}}$: Property, plant and equipment- gross for firm i at year t (wc02301);

u_{it}: Error term for firm i at year t.

All variables are scaled by the average of total assets at the end of the current year and at the end of the previous year. This is to reduce heteroskedasticity problems arising from the differing sizes of the firms. Thus, in this model it is assumed that changes in revenues, less changes in receivables, as well as capital intensity create normal accruals. The credit sales are supposed to be abnormal.

A two-step methodology is followed: first the Total Accruals (TA) variable is computed by the balance sheet approach. This is because some countries did not disclose the cash flow map for the whole period considered. Therefore, we obtained TA by Equation (5):

TA = Δ Rec + Δ Inv + Δ OCA - Δ AP – Dep (5)

Where:

Δ Rec: Change in receivables (wc02051);

Δ Inv: Change in inventories (wc02101);

Δ OCA: Change in other current assets (wc02149);

Δ AP: Change in accounts payables (wc03040);

Dep: Depreciation and amortization (wc01151).

The second step consists of estimating the Regressions (4) to obtain the AA by residuals, which are estimated in a cross-sectional approach. As 40 industries are included in a 10-year period, then 400 regressions are estimated. The number of observations per industry differs, though with a minimum of 9 observations (firms per year). This approach assumes that AA is homogeneous in each industry, as stated by Larcker and Richardson (2004).

Section 2: Methodology: Econometric Model, Sample and Descriptive Statistics

2.1.1. Econometric model variables definitions

The relationship between firm performance and accounting information quality is estimated using an econometric model.

$$ROE_{it} = \gamma_1 + \gamma_2 AA^{+}{}_{it} + \lambda_3 DE_{it} + \lambda_4 Big4_{it} + \gamma Size_{it5} + \varepsilon_{it}$$

(6)

Where,

ROE_{it}: Return on equity (wc08301);

AA^{+}_{it}: The positive Abnormal Accruals estimated;

$Size_{it}$: Log of total assets of firm i at year t (total assets-key item-wc02999);

DE_{it} Total debt to common equity (wc08231);

$Big4_{it}$ Dummy=1 when firm i is audited by one of the biggest international auditing firms at year t, and 0 otherwise (wc07800);

ε_{it}: Error term for firm i at year t.

This model is also tested with ROA as the dependent variable, with negative values of AA, and lagged AAA as an explanatory variable.

An unbalanced panel technique is used for the estimations of determinants in the firm's performance Model. This allows us to obtain coefficient estimations that consider differences by including several years and firms where some accounting data might be missing.

The data panel is unbalanced because some variables do not have values for certain years. This technique substitutes the missing variables and increases the efficiency of estimated coefficients (Soares and Stark, 2008).

If there is no correlation between the unobserved, individual, firm-specific effects u_{it} and the explanatory variables, the best way to estimate the model is using random effects as explained by Mcknight and Weir (2009). Panel data is estimated with fixed-effects because random coefficients were correlated and the results of Wooldridge (2005) show that the fixed-effects estimator is robust.

2.1.2. Variables definitions

While AA is the main explanatory variable in this investigation, other control variables that are also expected to affect the firm's performance are included:

Size is the natural logarithm (ln) of total assets of firm i in year t. For all countries the total assets were in Euros. Therefore, local currency for five countries is not used: Denmark, Norway, Sweden, Switzerland and the United Kingdom. The expected signal is positive,

because the biggest firms that have the best performances also have the best accounting services, as explained by Bradshaw *et al.* (2004), Beatty and Weber (2002), Mitton (2002), DeFond and Park (1997);

DE is the capital structure variable, given by the ratio of total debt to common equity, whose expected signal is positive because higher leverage means higher risk and thus higher costs; creditors and shareholders demand a greater return, as mentioned by Bradshaw *et al.* (2004), Warfield *et al.* (1995) and Christie and Zimmerman (1994). In addition, managers aim to avoid bad credit covenants (Beatty and Weber, 2002; Gopalakrishnan, 1994);

The third control variable is the Big4, which is expected to be positively correlated with the firm's performance. A firm audited by one of the biggest international audit firms will present more accurate accounting information because the firm must report all its earnings (Bradshaw *et al.*, 2004 and Mitton, 2002).

2.2. Sample and Descriptive Statistics

2.2.1. Sample

Accounting data is collected from Worldscope for 17 European countries from 1997 to 2006. Only firms that have accounting information available in Worldscope for all years are included. This condition is imposed only to estimate the abnormal accruals. This gives us 1,490 firms with 14,900 firm-year observations. In addition, firms with a Standard Industrial Classification (SIC) code of 6000 to 6999 were excluded because financial institutions have specific regulations. This reduced the sample to 1,477 firms.

Firms in industries with fewer than 9 firms are also excluded. This is because the Model has 8 explanatory variables. This restriction further reduces our sample by 19 firms. In the end, the sample contains 1,406 firms in 40 industries.

For the determinants Model with current AA, the sample has 14,060 firm-year observations over a ten-year period (1997 to 2006). For lagged AA, this implies a loss of one year. Therefore, regression estimations are made with a total of 12,654 firm-year observations over a nine-year period, from 1998 to 2006. Then we divided the sample into two sets: positive AA and negative AA.

2.2.2. Descriptive statistics

The collected sample presents a heterogeneous structure because the number of firms from each country varies considerably.

For the period considered, and from Table 1, 1,068 firms were audited by one of the biggest auditing firms. This represents almost 76% of the total sample.

Luxembourg is the country with the highest percentage of Big4 audits: all firms were audited by a Big4 firm. Ireland exhibits strong investor protection (one of the two countries with common law) as more than 86% of firms were audited by one of the Big4 (Table 1 and Table 2). Norway also has a high percentage of firms audited by a Big4, at 96%. In contrast, France has the smallest percentage of Big4-audited firms in the sample. Portugal, Greece and Spain only had half of their firms audited by one of the Big4. These numbers are in agreement with La Porta *et al.* (1998). These countries have code/French law origins, which provide less protection for investors than those of other legal origins. As mentioned above, in Luxembourg all firms were audited by one of the Big4. This is the highest percentage of firms with a Big4 audit. However, only four firms from this country were included in the sample due to the restrictions explained above.

Table 1: Countries corporate governance characteristics

Countries	Cross-section			**Law/ Origin**
	Total Firms	Big4	% Big4	
Austria	30	18	60.00	Code/German
Belgium	33	24	72.73	Code/French
Denmark	49	42	85.71	Code/ Scandinavian
Finland	53	42	79.25	Code/ Scandinavian
France	180	91	50.56	Code/French
Germany	184	130	70.65	Code/German
Greece	42	19	45.24	Code/French
Ireland	19	19	100.00	Common/English
Italy	79	69	87.34	Code/French
Luxembourg	4	4	100.00	Code/French
Netherlands	68	65	95.59	Code/French
Norway	23	22	95.65	Code/ Scandinavian
Portugal	13	7	53.85	Code/French
Spain	44	28	63.64	Code/French
Sweden	65	64	98.46	Code/ Scandinavian
Swiss	92	82	89.13	Code/German
UK	428	342	79.91	Common/English
Total	1406	1068	75.96	

In Table 2, the UK had the highest number of audited firms, with close to 31% of firms in the sample. Firms in all industries were considered; with the exception of SIC code 16 (Building- Heavy). The number of firms from countries with code law is larger than the

number of firms under common law (68% of the 17 countries considered, less the UK and Ireland). Taking into account the conclusions of La Porta, Lopez-de-Silanes and Vishny (2000), our sample has more firms with less investor protection.

Table 2: Number of firms per country and industries in cross- sectional sample

SIC2	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxemb.	NL	Norway	Portugal	Spain	Sweden	Swiss	UK	Total Industry	% of total
13	0	0	0	0	4	0	0	1	0	0	0	1	0	1	0	0	9	16	1.1
15	5	1	1	2	3	3	0	2	0	0	2	0	3	0	1	0	20	43	3.1
16	0	0	2	0	4	3	5	3	0	0	3	0	0	7	1	0	0	28	2.0
17	1	0	0	1	2	1	0	0	0	0	1	0	0	1	1	0	7	15	1.1
20	4	7	5	6	15	12	5	4	0	2	6	0	1	2	1	7	15	92	6.5
22	1	0	1	0	3	1	1	0	10	0	1	0	0	0	0	0	5	23	1.6
23	0	0	0	2	1	9	1	0	1	0	1	0	0	0	0	0	4	19	1.4
25	0	0	1	0	1	1	2	0	0	0	3	1	0	0	0	0	2	11	0.8
26	2	0	1	9	2	2	0	0	3	0	1	2	2	1	6	1	3	35	2.5
27	0	0	1	2	1	1	0	2	6	0	5	2	0	0	1	3	12	36	2.6
28	1	2	5	1	13	19	2	1	5	0	4	0	0	2	0	6	31	92	6.5
29	1	0	0	0	1	0	0	0	2	0	1	1	0	1	0	0	2	9	0.6
30	1	4	0	2	4	3	0	0	0	0	0	0	0	1	1	0	6	22	1.6
32	4	0	5	0	5	13	2	3	4	0	1	0	1	2	0	2	11	53	3.8
33	2	3	0	1	2	1	6	0	2	0	2	2	0	2	1	5	8	37	2.6
34	0	0	0	3	6	2	2	1	1	0	2	0	0	0	3	4	13	37	2.6
35	0	1	1	4	8	26	1	0	3	0	4	2	0	0	9	16	19	94	6.7
36	1	2	3	4	14	14	0	0	5	0	3	1	0	2	4	7	24	84	6.0
37	1	2	0	0	8	12	0	0	11	0	1	0	0	3	7	1	9	55	3.9
38	0	0	2	1	5	5	0	0	5	0	1	1	0	0	3	6	19	48	3.4
39	0	0	0	1	2	2	0	0	1	0	0	0	0	0	0	0	6	12	0.9
42	0	0	1	0	3	1	0	0	0	0	2	0	0	0	0	0	3	10	0.7
44	0	1	1	3	0	2	1	1	0	0	0	3	0	0	1	1	4	18	1.3
45	2	0	1	1	1	3	0	0	0	0	0	0	0	1	0	0	5	14	1.0
47	0	0	1	0	1	2	1	0	3	0	0	0	0	2	0	1	4	15	1.1
48	0	2	1	0	6	1	1	0	4	1	2	0	1	2	4	2	7	34	2.4
49	2	2	0	2	7	6	0	0	2	1	0	2	1	5	0	5	14	49	3.5
50	0	1	6	3	11	7	5	1	0	0	5	1	0	2	5	6	27	80	5.7
51	2	1	3	1	14	15	3	2	1	0	2	2	0	3	0	4	6	59	4.2
53	0	0	0	2	3	0	0	0	0	0	0	0	0	0	0	2	5	12	0.9
54	0	2	0	2	3	0	0		0	0	3	0	2	0	0	1	3	16	1.1
55	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0	5	10	0.7
56	0	0	0	0	1	0	0	0	0	0	0	0	0	1	3	1	8	14	1.0
58	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3	10	15	1.1
59	0	1	0	0	3	3	0	1	1	0	0	0	0	0	0	0	7	16	1.1
70	0	0	0	0	4	1	1	0	2	0	0	0	0	2	0	1	7	18	1.3
73	0	1	2	0	9	7	1	0	3	0	6	1	0	1	9	6	46	92	6.5
79	0	0	0	0	5	0	0	0	1	0	0	0	2	0	0	1	8	17	1.2
80	0	0	0	0	1	5	1	0	0	0	0	0	0	0	0	0	4	11	0.8
87	0	0	4	0	3	1	0	0	0	0	5	1	0	0	2	0	29	45	3.2
Total Country	30	33	49	53	181	184	41	22	76	4	68	23	13	44	66	92	427	1406	100.0
% of total	2.1	2.3	3.5	3.8	12.9	13.1	2.9	1.6	5.4	0.3	4.8	1.6	0.9	3.1	4.7	6.5	30.4	100	

The industry with the largest number of firms is SIC code 35 (Industrial), with 6.7% of the total. But there are several industries around 6%, such as SIC code 73 (Business Services), 28 (Chemicals) and 20 (Food). The industries with the fewest number of firms are SIC code 29 (Petroleum), with the minimum 9 firms, and SIC code 39 (Manufacturing), with 10 firms. The composition of the sample by country and industry is shown in Table 2.

In Table 3 are the two-digit SIC code industries with their respective means of Absolute value of AA (AAA), of ROE and of positive AA and negative AA. SIC code 15 (Buildings- Light) has the highest mean of AAA in averaged total assets, over 8.4%. This industry represents just 3% of the total sample (Table 2). ROE is above the average (7.66% and 6.23%, respectively), which suggests that positive AA has a stronger impact on ROE than negative AA. However, it is not the highest value.

The three most represented industries, SIC code 35- Industrial, SIC code 36-Electrical and 73- Business Services, have high levels of AAA, with a mean of close to 6.7%, 6.6% and 8% of total assets, respectively. In other words, in Tables 3 and 2 it is possible to see high levels of AAA in industries that have a considerable number of firms. Together, these industries represent more than 21% of the sample with AAA above the sample average (Table 3). Further, more than half of the industries considered (21 of 40) have levels of AAA higher than the sample mean. However, considering the ROE these three industries exhibit lower levels than the sample mean (nearly 4.5% and 5%), which suggests that negative AA has a stronger impact on ROE than positive AA. Thus, we have opposing evidence.

The industries with the fewest AAA are water and air transportation (SIC code 44 and 45), with nearly 2% in each (Table4). These industries are not very representative because they each constitute less than 1% of the sample. The ROE is 3.79% and 7.78%, respectively (Tables 2 and 3).

In Table 4 we have some descriptive statistics. The mean of positive AA is 5.13% of the averaged total assets and very similar to negative AA, which is 5.17%. The mean firm size is about €4,564,950.00. On average, the ROA is higher for positive AA than for negative AA: 5.97% and 3.97, respectively. If we consider ROE, these differences are more significant; 13.2% for positive AA and 4.4% for negative AA. The debt to equity ratio is 88% for income increasing AA and almost 92% in income decreasing AA. However, standard deviation is higher for income decreasing AA.

In Table 5 we see the highest correlation between AA and dependant variable observed for negative AA and ROA, which is nearly 0.22. The correlations with positive AA are not so strong: 0.044 for ROE and 0.041 for ROA. The correlation between ROA and DE ratio is still very small and negative. This contrasts with ROE, which is positive and above 0.10. The correlation between Size and Big4 is 0.28 for positive AA and 0.22 for negative AA.

Table 3: Industry denomination and each absolute value of Abnormal Accruals

SIC2	Industry	AAA	ROE	AA+	AA-
13	Oil & Gas	0.048364655	7.328252	0.023052	-0.02378
15	Building- Light	0.084022459	7.664727	0.042011	-0.04201
16	Building- Heavy	0.074996399	5.993611	0.037498	-0.0375
17	Construction	0.053132166	7.077556	0.026566	-0.02657
20	Food	0.049722951	6.928104	0.024861	-0.02486
22	Textile mill	0.041374786	3.130676	0.020687	-0.02069
23	Apparel	0.049965843	11.03801	0.024983	-0.02498
25	Furniture	0.061007529	6.840202	0.030504	-0.0305
26	Paper	0.03154976	4.640857	0.015775	-0.01577
27	Printing	0.033504601	10.74227	0.016752	-0.01675
28	Chemicals	0.045037408	3.721276	0.022519	-0.02252
29	Petroleum	0.022230844	8.610864	0.011115	-0.01112
30	Rubber	0.037141488	7.731531	0.018571	-0.01857
32	Stone	0.042937747	6.602274	0.021469	-0.02147
33	Metal Work- Basic	0.049609058	4.637778	0.024805	-0.0248
34	Metal Work- Fabrication	0.039247411	7.565498	0.019624	-0.01962
35	Industrial	0.066969671	4.55785	0.033485	-0.03348
36	Electrical	0.065500408	4.632887	0.03275	-0.03275
37	Transport Equipment	0.049874877	6.595374	0.024937	-0.02494
38	Instruments	0.04653678	6.67014	0.023268	-0.02327
39	Misc. Manufacturing	0.049078812	10.57713	0.024539	-0.02454
42	Motor Freight	0.040155187	7.847444	0.020078	-0.02008
44	Water Transport	0.027941279	3.786852	0.013971	-0.01397
45	Air Transport	0.022271353	7.776694	0.011136	-0.01114
47	Transport Services	0.050448316	6.667704	0.025232	-0.02522
48	Communications	0.050084184	8.273929	0.025042	-0.02504
49	Utilities	0.033087356	6.344626	0.016544	-0.01654
50	Durables- Wholesale	0.062722744	7.218565	0.031361	-0.03136
51	Non Durables- Wholesale	0.053159494	6.070678	0.02658	-0.02658
53	General Stores	0.029425799	6.772315	0.014713	-0.01471
54	Food Stores	0.025833165	7.905694	0.012917	-0.01292
55	Auto Dealers	0.049041197	6.414556	0.024521	-0.02452
56	Apparel Retail	0.054097932	1.976111	0.027049	-0.02705
58	Eating	0.023159576	7.986567	0.01158	-0.01158
59	Misc. Retail	0.045700191	3.102014	0.02285	-0.02285
70	Hotels	0.037618876	7.58537	0.018809	-0.01881
73	Business Services	0.079249074	5.04233	0.039625	-0.03962
79	Amusement & Recreation Services	0.048993939	0.05876	0.024497	-0.0245
80	Health Services	0.04029709	2.719495	0.020149	-0.02015
87	Engineering, Accounting &Management Services	0.07194476	2.49665	0.035972	-0.03597
	Average	0.047175929	6.23333	0.02356	-0.02358

Table 4: Descriptive statistics

Positive AA					
	ROE	ROA	AA	SIZE	DE
Mean	13.2147	5.9715	0.0513	4564950	88.0307
Median	12.5900	5.9100	0.0331	466564.5	56.3400
Maximum	2019.0200	106.8500	0.9291	264000000	37501.9200
Minimum	-494.0000	-89.9600	0.0000	2765	-23635.1400
Std. Dev.	37.9685	8.1633	0.0613	15731715	717.1418
Obs.	6,872	6,872	6,872	6,872	6,872
Negative AA					
Mean	4.42196	3.9705	-0.0517	13.1854	91.9254
Median	10.6700	4.8600	-0.0336	12.9599	56.1900
Maximum	1742.860	125.0100	0.0000	19.4289	29869.4300
Minimum	-7034.1400	-267.1500	-0.9877	7.4012	-93200.0000
Std. Dev.	123.8218	11.4705	0.0622	1.9891	1377.3590
Obs.	6,667	6,667	6,667	6,667	6,667

Definition of variables: AA is the absolute value of AA and this is abnormal accruals and consists of residuals of regression estimation: $TA_i = \alpha_1 + \alpha_2(\Delta sales - \Delta receivables) + \alpha_3 PPE + u_i$. TA is Total Accruals and is obtained by changes in receivables (wc02051) plus change in inventories (wc02101) and change in other current assets (wc02149) less change in accounts payables (wc03040) and less depreciation (wc01151). All variables from this model are scaled by the average of total assets (wc02999). Size is the natural logarithm of total assets (wc02999). ROA is returns on assets (wc08326). Finally, DE is Debt to Equity and is defined as total debt to common equity (wc08231).

Table 5: Correlations between firm's performance and the independent variables

Panel A: Correlations using positive AA

	ROE	ROA	AA	SIZE	DE	BIG4
ROE	1.0000	0.5435	0.0435	0.0479	0.1079	0.0649
ROA	0.5435	1.0000	0.0405	0.0587	-0.0024	0.0800
AA+	0.0435	0.0405	1.0000	-0.1579	0.0063	-0.0850
SIZE	0.0479	0.0587	-0.1579	1.0000	0.0412	0.2861
DE	0.1079	-0.0024	0.0063	0.0412	1.0000	0.0292
BIG4	0.0649	0.0800	-0.0850	0.2861	0.0292	1.0000

Panel B: Correlations using negative AA

ROE	1.0000	0.2892	0.0672	0.0678	0.1245	0.0440
ROA	0.2892	1.0000	0.2167	0.1454	-0.0069	0.0688
AA-	0.0672	0.2167	1.0000	0.1788	-0.0008	0.0687
SIZE	0.0678	0.1454	0.1788	1.0000	0.0262	0.2276
DE	0.1245	-0.0069	-0.0008	0.0262	1.0000	-0.0185
BIG4	0.0440	0.0688	0.0687	0.2276	-0.0185	1.0000

The definitions of variables are given in Table 4.

Section 3: Empirical results

From the results, we see that the adjusted R squared is at low levels for all tests. However, it is higher with ROA than with ROE in all estimations:

As expected, the effect of abnormal accruals on firm performance is positive, be they positive or negative abnormal accruals: when we have more positive abnormal accruals the ROA and ROE increase; when negative abnormal accruals increase the ROA and ROE decrease. These results confirm the mechanical relationship between these accounting measures.

The control variables excepting the leverage variable, present the expected impact on firm performance. Thus, becoming larger and being audited by a Big4 improves the economic performance of a firm in accordance with Bradshaw *et al.* (2004), Beatty and Weber (2002) and Mitton (2002). When leverage scaled by equity increases, firm performance also increases as a result of accounting decisions made by managers in order to avoid covenants restrictions (Betty and Weber, 2002 and Gopalakrishnan, 1994).

All the coefficients are statistically significant at a 1% level, except the positive abnormal accruals, which are significant only at 10% level and DE, which is not significant. See Tables 7 and 8.

Table 7: Impact of positive AA on firm performance

Independent variable	Predicted Sign	Coefficient (Ols t-statistics) ROA	Prob.	Coefficient (Ols t-statistics) ROE	Prob.
c		-2.69153	***	-1.8353	
		(-2.89458)		(-0.5804)	
AA+	+	3.527818	*	30.5376	***
		(1.606115)		(4.07659)	
Size	+	0.522809	***	0.70782	***
		(7.391744)		(2.95204)	
DE	-	8.06E-06		0.00543	***
		(0.064903)		(8.61022)	
Big4	+	1.737117	***	4.75756	***
		(5.259607)		(4.27743)	
Number of Obs.		6989		6872	
Adjusted R-squared		0.02846		0.02841	

Definitions of variables: AAA is the absolute value of AA and this is abnormal accruals and consists of residuals of regression estimation: $TA_i = \alpha_1 + \alpha_2(\Delta sales - \Delta receivables) + \alpha_3 PPE + u_i$. TA is Total Accruals and is obtained by changes in receivables (wc02051) plus change in inventories (wc02101) and change in other currents assets (wc02149) less changes in accounts payables (wc03040) and less depreciation (wc01151). AAA-1 is AAA in the previous year. All variables from this model are scaled by the average of total assets (wc02999). Size is the natural logarithm of a firm's total assets (wc02999); DE is Debt to Equity given by total debt to common equity (wc08231); Big4 is a dummy and it is 1 if auditing firm is one of the four biggest international companies and zero otherwise (wc07800) ROA is return on assets (wc08326);

***correlation is significant at the 0.01 level.

**correlation is significant at the 0.05 level.

Table 8: Impact of negative AA on firm performance

Independent variable	Predicted Sign	Coefficient (Ols t-statistics) ROA	Prob.	Coefficient (Ols t-statistics) ROE	Prob.
c		-9.68321	***	-38.366	***
		(-8.37338)		(-3.6324)	
AA-	+	38.28574	***	113.096	***
		(14.3217)		(4.61004)	
Size	+	1.128091	***	3.07997	***
		(13.0304)		(3.90656)	
DE	-	-7.10E-05		0.01109	***
		(-0.73329)		(10.1843)	
Big4	+	0.647597	*	9.26248	***
		(1.625475)		(2.58219)	
Number of Obs.		6834		6667	
Adjusted R-squared		0.07477		0.02504	

The definitions of variables are given in Table 7.
***correlation is significant at the 0.01 level.
*correlation is significant at the 0.1 level.

With the lagged methodology, the relationships of explanatory and dependent variables do not change significantly.

In Table 9, the positive lagged AA produces a statistically significant impact at a 1% level, both on ROE and ROA. However, only for ROE is the signal negative—as expected (Chan *et. al*, 2004). This result means that higher AA in the previous year causes a decrease in the firm's current performance. For ROA, the relationship with the positive, previous year AA is still positive, meaning that the reverse effect does not happen in consecutives years.

With regard to the control variables included, all variables are statistically significant and produce the expected effect on ROE and ROA, except for DE, which is not significant and presents the opposite effect. Nevertheless, the impact is very small; close to zero. The explanatory variables Size and Big4 produce a positive impact on ROA, as well as on ROE. Therefore, when these variables increase, the ROA/ROE also increases.

Table 9: Impact of positive lagged AA on firm performance

Independent variable	Predicted Sign	Coefficient (Ols t-statistics) ROA	Prob.	Coefficient (Ols t-statistics) ROE	Prob.
c		-5.285626	***	-24.621	***
		(-5.406421)		(-6.3936)	
lagAA+	-	-6.448162	***	15.7162	***
		(-2.810532)		(1.71329)	
Size	+	0.742743	***	2.19134	***
		(10.01937)		(7.53244)	
DE	-	-0.000155		0.00655	***
		(-1.010662)		(9.57601)	
Big4	+	1.193822	***	5.53325	***
		(3.440432)		(4.09131)	
Number of Obs.		6302		6204	
Adjusted R-squared		0.038901		0.03827	

The definitions of variables are given in Table 7.
***correlation is significant at the 0.01 level.

In Table 10, the negative lagged AA does not have a statistically significant impact on firm performance, neither on ROA nor ROE. The signal is positive and opposite from the expected because the variable AA is supposed to reverse (Chan *et. al*, 2004).

The explanatory variable Size is the most robust because in all tests it presents a significance level of 1%, as well as the expected signal: when the size of a firm increases its economic performance improves. The results for Big4 are also robust but, at this time, the significance level is 5%. DE is not consistent: with ROA it produces the predicted negative impact on performance but without significance. With ROE the relationship becomes positive and significant.

Table 10: Impact of negative lagged AA on firm performance

Independent variable	Predicted Sign	Coefficient (Ols t-statistics) ROA	Prob.	Coefficient (Ols t-statistics) ROE	Prob.
c		-9.512816	***	-29.542	***
		(-7.514814)		(-2.5858)	
lagAA-	-	24.31285		27.5722	
		(8.353881)		(1.0248)	
Size	+	1.05992	***	2.30731	***
		(11.20457)		(2.70801)	
DE	-	-4.46E-06		0.01111	***
		(-0.047158)		(9.66621)	
Big4	+	0.945406	**	8.36466	**
		(2.166903)		(2.148)	
Number of Obs.		6137		5976	
Adjusted R-squared		0.047587		0.0192	

The definitions of variables are given in Table 7.
***correlation is significant at the 0.01 level.
**correlation is significant at the 0.05 level.

Section 4: Conclusions

The findings provide evidence that accounting quality tends to produce a negative impact on firm performance within European countries: ROA and ROE increase when the positive AA increases and decrease when negative AA becomes more negative. Thus, our results confirm the mechanical relationship between accounting ratio for performance and current AA for accounting quality.

With regard to the lagged AA approach, the only expected relationship occurs between lagged positive AA and ROA that is negative, because the effect is supposed to reverse (Chan et al, 2004). Therefore, higher AA in the previous year tends to reduce the firm's current performance. The other three coefficients are positive, thus our results suggest that the reverse effect does not occur in two consecutive years.

As control variables of firm performance are concerned, the results obtained show that size and being auditing by a Big4 firm are relevant factors and that they produce a positive impact on firm performance in both approaches: current and lagged. In other words, huge firms and those audited by one of the biggest international auditing company exhibit the best performances. These results were obtained in all tests. Regarding capital structure, it is the

only control variable that is not consistent. DE produces the opposite effect from the predicted on firm performance. When leverage scaled by equity rises, the firm performance improves both for ROA and ROE in the current AA approach and for ROE in the lagged AA approach. This might occur to prevent debt constraints as explained by Betty and Weber (2002). The only exception is for lagged AA, which produces a negative impact on ROA, meaning that a large DE ratio negatively affects the ROA. However, this result has no statistical significance.

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