

Value relevance of alternative methods of accounting for actuarial gains and losses

Abstract

The adoption of IAS 19: Employee benefits (2004) provided managers with an important accounting choice affecting the time and placement of actuarial gains and losses recognition. IAS 19 enables a choice between three major accounting methods related to the recognition of actuarial gains and losses of defined benefit plans: profit or loss method, equity recognition method and corridor method. The objective of this paper is to compare the ability of the three alternative methods for recognising actuarial gains and losses to reflect companies' value. We manually collect information about the accounting method of recognising actuarial gains and losses adopted by 91 European companies listed in EURONEXT100, in 2005, 2006 and 2007. We applied regression analysis to investigate the value relevance of financial information under equity recognition method, profit or loss method and corridor method. Findings suggest that the recognition of all actuarial gains and losses in equity best reflects the market's valuation of actuarial gains and losses.

Author Keywords: actuarial gains and losses, corridor, equity, defined benefit plans.

JEL Classification: M4.

1. Introduction

Accounting for defined benefit plans is an important, complex and actual financial reporting issue.

Defined benefit plans can entail one of the biggest liabilities that a company has in its balance sheet. Severinson (2008) found that 40% of companies from a global index reported defined benefit obligation due to pensions in 2007. Severinson (2008) also found that the defined benefit obligation represents, on average, 18% of market capitalization of companies.

Although defined benefit plans are an important way of compensation, the accounting treatment of defined benefit plans required by International Accounting Standard (IAS) 19 has long been criticised by companies, analysts, investors and other users. Some of the main concerns are that the accounting model has too many conceptual compromises and the different methods for recognising gains and losses lead to lack of comparability.

In response to those criticisms, the International Accounting Standards Board (IASB) has put a long-term project on employee benefits on its agenda in 2006. Both the IASB and the Financial Accounting Standards Board (FASB) have announced that they will jointly develop a single standard for pension accounting. Additionally, in March 2008, IASB issued a discussion paper about the preliminary views on short term amendments to IAS 19. In this paper, IASB proposed to eliminate the deferred recognition of actuarial gains and losses (corridor method).

The objective of this paper is to compare the ability of the three alternative methods for recognising actuarial gains and losses to reflect companies' value, for a sample of 91 companies included in EURONEXT 100, that have defined benefit plans and that disclosed information about the method of recognising actuarial gains and losses, for the period between 2005 and 2007. The alternative accounting methods are described in section 2. For each accounting method I estimated a valuation equation. This estimation includes: (1) an equation that adjusts reported net income and book value of equity to reflect the recognition of all actuarial gains and losses in equity (equity recognition method); (2) an equation that adjusts reported net income and book value of equity to reflect the recognition of all actuarial gains and losses in profit or loss (profit or loss method) and (3) an equation that adjusts reported net income and book value of equity to reflect the recognition of actuarial gains and losses under the corridor method (corridor method). To minimize potential effects of scale differences across sample companies, all equations are deflated by the number of shares outstanding at the year end.

My paper contributes to prior literature by showing which method of accounting for actuarial gains and losses provides more value relevant information, for the first three years that the adoption of IFRS/IAS is mandatory. I also investigated the only issue that under IAS/IFRS allows the companies to choose between recognising all actuarial gains and losses in profit or loss or directly in equity.

The structure of the paper is as follows. Section 2 provides a description of the alternative accounting methods for recognising actuarial gains and losses, the equations estimation and sample. Section 3 presents descriptive statistics and explains empirical results. Finally, section 4 presents the main conclusions.

2. Research design

2.1. Description of alternative accounting methods

In this section, I summarize the three accounting methods for recognising actuarial gains and losses and their underlying economic assumptions.

Actuarial gains and losses may result from increases or decreases in either the present value of a defined benefit obligation or the fair value of any related plan assets of defined benefit plans (IAS 19, § 94) and IAS 19: Employee Benefits (2004) enables a choice between three major accounting methods related to the recognition of actuarial gains and losses: profit or loss method, equity recognition method and corridor method.

Under profit or loss method, all actuarial gains and losses are recognised in income statement in the period in which they occur. Immediate recognition of all actuarial gains and losses represents more faithfully the company's financial position, results in more transparent and understandable financial statements and improves comparability across companies (IASB, Discussion Paper, 2008).

Equity recognition method was introduced in 2004 and is based on the United Kingdom (UK) Financial Reporting Standard (FRS) 17: Retirement Benefits (2000). Under this method, all actuarial gains and losses are recognised immediately outside profit or loss and should be presented separately within a statement of recognised income and expense (IAS 19, §93B). Similar to profit or loss method, the equity recognition method requires the recognition of all actuarial gains and losses. However, the equity recognition method creates an exception to the recognition of all income and expenses in profit or loss.

The third method, followed by the majority of European companies (Morais, 2008) is the corridor method. Under this method, only the cumulated actuarial gains and losses that exceed a predetermined level (corridor) have to be recognised in profit or loss. The portion of actuarial gains and losses to be recognised in profit or loss is the “excess” divided by the expected average remaining working lives of the employees participating in the plan. The “excess” is determined by the difference between the net cumulative unrecognised actuarial gains and losses and the greater of 10% of the present value of defined benefit obligation and 10% of the fair value of plan assets. The portion of actuarial gains and losses not recognised in profit or loss is recognised as a liability, in the balance sheet.

The IASB’s Discussion Paper (2008) presents four main views that supported the corridor method. The first view considers that defined benefit obligations are more difficult to measure than other obligations, since it is impossible to predict accurately all the variables included in the valuation of defined benefit obligations. Therefore, companies should not reflect in profit or loss all actuarial gains or losses because some of the actuarial gains and losses may not result from the events of that period. The second view considers that actuarial gains and losses are not relevant to users of financial information, because some actuarial gains and losses may reverse or offset each other. The third view believes that the volatility resulting for the immediate recognition of all actuarial gains and losses is too great to be acceptable in financial statements. Finally, the fourth view states that the immediate recognition of all actuarial gains and losses may induce a reduction or even a cancellation of defined benefit plans.

2.2. Equations estimation

The objective of this paper is to compare the ability of the three alternative methods for recognising actuarial gains and losses to reflect companies' value. To accomplish this objective, I estimated the valuation equation. Our benchmark model uses net income and book value of equity under the method chosen by companies.

i) Companies that adopted the corridor method

For companies that chose the corridor method, I estimated the valuation equation by adjusting net income and book value of equity in order to obtain the net income and book value of equity under the equity recognition method and profit or loss method.

To obtain the net income under equity recognition method, I increased net income under the corridor method by the amount of actuarial losses recognised in income under the corridor method and decreased net income under the corridor method by the amount of actuarial gains recognised in income under the corridor method. To obtain equity under equity recognition method, I decreased equity under the corridor method by the amount of unrecognised actuarial losses at the year end under the corridor method and increased equity by the amount of unrecognised actuarial gains at the year end under the corridor method.

To obtain the net income under profit or loss method, I decreased net income under the corridor method by the difference between actuarial losses of the period and actuarial losses recognised in income under the corridor method and I increased net income under the corridor method by the difference between actuarial gains of the period and actuarial gains recognised in income under the corridor method. To obtain equity under profit or loss method, I decreased equity under the corridor method by the amount of

unrecognised actuarial losses at the beginning of the year under the corridor method and increased equity under the corridor method by the amount of unrecognised actuarial gains at the beginning of the year.

Therefore, for companies that adopted the corridor method, the valuation equations under corridor method, equity recognition method and profit or loss method are, respectively:

$$MVE_{it} = \varpi_0 + \varpi_1 NICM_{i,t} + \varpi_2 BVECM_{i,t} + \varepsilon_{it} \quad (1a)$$

$$MVE_{it} = \varpi_0 + \varpi_1 NICME_{i,t} + \varpi_2 BVECME_{i,t} + \varepsilon_{it} \quad (1b)$$

$$MVE_{it} = \varpi_0 + \varpi_1 NICMPL_{i,t} + \varpi_2 BVECMPL_{i,t} + \varepsilon_{it} \quad (1c)$$

Where MVE is the market value of equity at the year end; BVECM is the book value of equity at the year end under the corridor method and NICM is net income under the corridor method; BVECME is the book value of equity at the year end under the corridor method minus unrecognised actuarial losses (UALf) and plus unrecognised actuarial gains (UAGf) at the year end; NICME is net income under the corridor method plus actuarial losses recognised in income under corridor method minus actuarial gains recognised in income under the corridor method; NICMPL is net income under the corridor method adjusted by the difference between actuarial gains and losses of the period and actuarial gains and losses recognised in profit or loss under corridor method; BVECMPL is equity under the corridor method minus unrecognised actuarial losses (UALf) at the year end plus unrecognised actuarial gains (UAGf) at the year end.

ii) Companies that adopted the equity recognition method

For companies that adopted the equity recognition method, I estimated the valuation equation by adjusting net income and book value of equity in order to obtain the net income and book value of equity under profit or loss method.

To obtain the net income under profit or loss method, I decreased net income under the equity recognition method by the amount of actuarial losses of the period and increased net income under the equity recognition method by the amount of actuarial gains of the period. Book value of equity under profit or loss method is equal to book value of equity under equity recognition method since all actuarial gains and losses are recognised in equity.

Therefore, for companies that adopted the equity recognition method, the valuation equations under equity recognition method and profit or loss method are, respectively:

$$MVE_{it} = \varpi_0 + \varpi_1 NIE_{i,t} + \varpi_2 BVEE_{i,t} + \varepsilon_{it} \quad (2a)$$

$$MVE_{it} = \varpi_0 + \varpi_1 NIEPL_{i,t} + \varpi_2 BVEE_{i,t} + \varepsilon_{it} \quad (2b)$$

Where MVE is the market value of equity at the year end; BVEE is the book value of equity at the year end under the equity recognition method and NIE is net income under the equity recognition method; NIEPL is net income under equity recognition method minus actuarial losses of the period (AL) plus actuarial gains (AG) of the period.

iii) Companies that adopted the profit or loss method

Finally, for companies that adopted the profit or loss method, I estimated the valuation equation by adjusting net income and book value of equity in order to obtain the net income and book value of equity under equity recognition method.

In order to obtain that estimation, I increased net income under the profit or loss method by the amount of actuarial losses for the period and decreased net income under the profit or loss method by the amount of actuarial gains for the period. Book value of equity under profit or loss method is equal to book value of equity under equity recognition method since all actuarial gains and losses are recognised in equity.

Therefore, for companies that adopted the profit or loss method, the valuation equations under profit or loss method and equity recognition method are, respectively:

$$MVE_{it} = \varpi_0 + \varpi_1 NIPL_{i,t} + \varpi_2 BVEPL_{i,t} + \varepsilon_{it} \quad (3a)$$

$$MVE_{it} = \varpi_0 + \varpi_1 NIPL_{i,t} + \varpi_2 BVEPL_{i,t} + \varepsilon_{it} \quad (3b)$$

Where MVE is the market value of equity at the year end; BVEPL is the book value of equity at the year end, under the profit or loss method and is equal to book value of equity under equity recognition method (BVEE) and NIPL is net income under profit or loss method; NIPL is net income under profit or loss method plus unrecognised actuarial losses (AL) of the period minus unrecognised actuarial gains (AG) of the period.

To minimize scale effects, all equations are estimated using variables deflated by the number of shares outstanding at the year end.

I first manually collected information about post employment benefits from annual reports, for 2005, 2006 and 2007, available on the companies' websites as well as on the website of Euroland (www.euroland.com).

I examined the Notes to the financial statements in order to identify if the company has defined benefit plans and, in that case, which accounting method of recognising actuarial gains and losses was adopted. We assigned the value 1 if the company adopted the corridor method, the value 0 if the company adopted the equity method and the value 2 if the company adopted the profit or loss method. I also collected information about the present value of the defined benefit obligation (PVO), fair value of plan assets (FVA), unrecognised actuarial gains (UAG) and losses (UAL) under corridor method, actuarial gains and losses recognised in profit or loss under corridor method and actuarial gains and losses recognised in equity under equity recognition method (AL and AG).

Information about market value of equity, net income, book value of equity and number of shares outstanding at the year end were obtained from Worldscope Database.

Then, I estimated cross-sectionally valuation equation for 2005, 2006 and 2007, as well as pooled regressions for equation using year-fixed effects. As heteroskedasticity is a common situation in these kinds of models, I adopted the White procedure to obtain consistent estimators for the standard errors of OLS estimators.

2.2. Sample

Our sample consists of 91 European listed companies that are included in the EURONEXT 100 in 2005 and that adopt the IASB standards.

TABLE 1 ABOUT HERE

Table 1, Panel A, shows descriptive statistics for my sample companies in terms of country representation. Of the total of companies, I excluded 2 companies that do not present their financial statements reports based on IAS/IFRS. A further 3 companies were excluded because of missing information. Finally, we excluded 4 companies because those companies do not have defined benefit plans. Consequently, the number of sample companies was reduced from 100 to 91. In terms of country representation, most of the companies are from France (67,03%).

Table 1, Panel B, shows representation by industry, in particular the number of financial companies and non-financial companies. I obtained information about industry from Worldscope Database and I considered financial companies the companies which the major industry group is 43 Financial. The sample comprises 19 companies from the financial sector (20,88%) and 72 companies from other sectors (79,12%). The industry classification shows that most of the companies are from non-financial sector.

Table 1, Panel C, shows the number of companies that adopted the corridor method, the equity recognition method and the profit or loss method, total and per country, in 2005, 2006 and 2007. The corridor method is the most adopted method by companies in all of the years (79,1% in 2005, 64,8% in 2006 and 58,2% in 2007), followed by the equity recognition method (16,5% in 2005, 33% in 2006 and 39,6% in 2007). The profit or loss method is the less used method (4,4% in 2005 and 2,2% in 2006 and 2007).

These results show that companies are changing their methods of recognising actuarial gains and losses from the corridor method to the equity recognition method. The analysis of the actuarial gains and losses accounting method by country shows that all the countries have a stronger adoption of the corridor method.

3. Results

3.1. Descriptive statistics

Table 2 provides descriptive statistics for our sample. As we can see, companies that adopted the corridor method of recognising actuarial gains and losses tend to be larger companies, with higher values of actuarial gains and losses for the period. By contrary, companies that adopted the equity recognition method show smaller amount of net income and higher values of liability recognised in the balance sheet.

TABLE 2 ABOUT HERE

Table 3 reports Pearson correlations among the variables. Table 3 reveals that most of the variables are correlated with each other. At a bivariate level, present value of obligation and fair value of assets are negatively correlated with market value of equity while net income and book value of equity are positively correlated with market value of equity.

TABLE 3 ABOUT HERE

3.2. Regression

Table 4, panel A, present regression summary statistics corresponding to valuation equations (1b), (2a) and (3b). Table 4, panel B, present regression summary statistics corresponding to valuation equations (1c), (2b) and (3a). Finally, table 4, panel C, present regressions results corresponding to valuation equation (1a). In these tests, I included all the companies in the sample (91 companies), except for the corridor method.

TABLE 4 ABOUT HERE

Panel A reveals that the coefficients on net income are significantly positive in the pooled sample and across all years, except for 2005. The book value of equity coefficients range from 0,131 and 0,619 and are all statistically significant except for 2006.

Panel B shows that the coefficient on net income are significantly positive in the pooled sample and across all years. The coefficients on book value of equity are positive in all estimations, but not significantly in 2006. The notable difference between the findings in panel A and panel B is a drop in model explanatory power when net income and book value of equity is adjusted to reflect the profit or loss method, in the pooled sample and across 2005 and 2006, although direct comparison of $\text{adj}R^2$ is not strictly valid.

Panel C reveals that the coefficients on net income are significantly positive in the pooled sample and across all years and higher than the coefficients under the equity recognition or profit or loss method, except for 2007. The model explanatory power is

lower in panel C than in panel A or B. The drop in explanatory power is consistent with actuarial gains and losses being revenue or expenses that should be recognised in whole. The results seem to suggest that the corridor method provides less value relevant financial information than the equity recognition or the profit or loss method. These results are consistent with Barth's findings (2001). She found that market pays some attention to the pension information reported in the financial statement notes, but may have some difficulties to weighting this information. However, the results are not supportive of Brown's conclusion (2002) that the market is able to effectively unwind aggressive managerial assumptions and fairly value pension liabilities and assets.

I performed the same tests using as an independent variable abnormal earnings instead of net income. I defined abnormal earnings as net income minus 4,5% (risk free rate for 30 years) of book value of equity at the beginning of the year and I reached similar results (untabulated results).

I also performed the same tests excluding companies that adopted the equity recognition method and profit or loss method in 2005, 2006 or 2006. Table 5, panel A to C, present regression summary statistics corresponding to valuation equations (1a), (1b) and (1c), respectively. I found that the explanatory power of the equity recognition method is higher than the explanatory power of the profit or loss method and corridor method in the pooled sample. The analysis of the results per year show that, in general, the explanatory power of the equity recognition method tend to be higher except for all the years except in 2007 that are similar to the corridor method.

TABLE 5 ABOUT HERE

4. Conclusions

This paper provides empirical evidence of the value relevance of financial information under the three different methods of accounting for actuarial gains and losses: the equity recognition method, the profit or loss method and the corridor method. Based on a sample of 91 European companies listed in EURONEXT 100, I investigated the value relevance of different method of accounting for actuarial gains and losses by estimating valuation equations.

The results of this study suggest that the recognition of all actuarial gains and losses provides more value relevant information than the deferred recognition of actuarial gains and losses. I also found that the equity recognition method provides more value relevant than the profit or loss method or the corridor method.

My findings make two main contributions to previous literature. First, this paper contributes to prior literature by showing which method of accounting for actuarial gains and losses provides more value relevant information, for the first three years that the adoption of IFRS/IAS is mandatory. Second, I investigated the only issue that under IAS/IFRS allows the companies to choose between recognising all actuarial gains and losses in profit or loss or directly in equity.

Although I included the adjustments to net income and book value of equity in order to estimate the valuation equations under the equity recognition method, the profit or loss method and the corridor method, I did not consider the fiscal effect of these adjustments. Additionally, our study includes a small number of companies, if we consider only those that adopted the corridor method. Finally, our study is limited to a three years period of mandatory adoption of IAS/IFRS. Future research can explore if the effects documented in this study are sustained in a longer period.

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Appendix A –Variables and variables definitions

1) Dependent variables

MVE	Market value of equity at the year end.
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2) Independent variables

Variable	Description
NICM	Net income under corridor method.
NIE	Net income under equity recognition method.
NIPL	Net income under profit or loss method.
NICME	$NICM+RAL-RAG$ Net income under the corridor method plus actuarial losses recognised in income under corridor method minus actuarial gains recognised in income under the corridor method.
NICMPL	$NICM-(AL-RAL)+(AG-RAG)$ Net income under the corridor method adjusted by the difference between actuarial gains and losses of the period and actuarial gains and losses recognised in profit or loss under corridor method.
NIEPL	$NIE-AL+AG$ Net income under equity recognition method minus actuarial losses of the period plus actuarial gains of the period.
NIPLE	$NIPL+AL-AG$ Net income under profit or loss method plus unrecognised actuarial losses of the period minus unrecognised actuarial gains of the period.
BVECM	Book value of equity at the year end under corridor method.
BVEE	Book value of equity at the year end under equity recognition method.
BVEPL	BVEE Book value of equity at the year end under profit or loss method.
BVECME	$BVECM-UALf+UAGf$ Book value of equity at the year end under the corridor method minus unrecognised actuarial losses and plus unrecognised actuarial gains at the year end.
BVECMPL	$BVECM-UALf+UAGf$ Equity under the corridor method minus unrecognised actuarial losses at the year end plus unrecognised actuarial gains at the year end.
AL	Actuarial losses of the period.
AG	Actuarial gains of the period.
RAL	Actuarial losses recognised in net income under the corridor method.
RAG	Actuarial gains recognised in net income under the corridor method.
UAG	Unrecognised actuarial gains under the corridor method at the year end.
UAL	Unrecognised actuarial losses under the corridor method at the year end.

Table 1
Companies included in the sample

Panel A: Number of companies included in the sample

Countries	Companies	Other GAAP	Missing information	Without defined plans	Total	%
Belgium	10	-	-	2	8	8,79%
France	66	2	3	-	61	67,03%
Netherlands	18	-	-	2	16	17,58%
Portugal	6	-	-	-	6	6,59%
Total	100	2	3	4	91	100%

Panel B: Industry analysis

Countries	Financial sector	%	Non-financial sector	%	Total
Belgium	3	37,50%	5	62,50%	8
France	10	16,39%	51	83,61%	61
Netherlands	4	25,00%	12	75,00%	16
Portugal	2	33,33%	4	66,67%	6
Total	19	20,88%	72	79,12%	91

Panel C: Actuarial gains and losses accounting policy choice

Countries	Equity	Corridor	Profit/loss	Total
Belgium				
2005	1 (12,5%)	7 (87,5%)	0 (0%)	8
2006	2 (25%)	6 (75%)	0 (0%)	8
2007	2 (25%)	6 (75%)	0 (0%)	8
France				
2005	8 (13,1%)	49 (80,3%)	4 (6,6%)	61
2006	21 (34,4%)	38 (62,3%)	2 (3,3%)	61
2007	27 (44,3%)	32 (52,2%)	2 (3,3%)	61
Netherlands				
2005	3 (18,8%)	13 (81,2%)	0 (0%)	16
2006	4 (25%)	12 (75%)	0 (0%)	16
2007	4 (25%)	12 (75%)	0 (0%)	16
Portugal				
2005	3 (50%)	3 (50%)	0 (0%)	6
2006	3 (50%)	3 (50%)	0 (0%)	6
2007	3 (50%)	3 (50%)	0 (0%)	6
Total				
2005	15 (16,5%)	72 (79,1%)	4 (4,4%)	91
2006	30 (33%)	59 (64,8%)	2 (2,2%)	91
2007	36 (39,6%)	53 (58,2%)	2 (2,2%)	91

Table 2
Descriptive statistics

Companies	N	Mean	Std deviation	Median	Minumum	Maximimum
All						
PVO						
2005	91	3359,35	6390,75	1114,00	4,10	47014,22
2006	91	3794,89	6929,87	1119,90	3,90	45675,56
2007	91	3543,27	6325,73	965,00	3,80	42478,13
FVA						
2005	91	2295,92	5473,56	438,00	0,00	46147,01
2006	91	2969,68	6707,66	780,70	0,00	51149,08
2007	91	2961,29	6676,48	659,30	0,00	51768,92
UAGL						
2005	91	154,13	418,67	12,00	-710,00	2541,00
2006	91	13,25	627,44	0,00	-4993,70	2425,00
2007	91	-97,89	827,43	0,00	-7703,04	597,00
L						
2005	91	912,73	1882,22	386,00	-966,00	14572,00
2006	91	832,99	1832,57	260,00	-1155,00	13896,00
2007	91	713,84	1772,18	190,00	-1593,19	13760,00
AGL						
2005	91	105,42	281,49	17,90	-743,08	1770,00
2006	91	-100,76	539,51	-2,50	-4697,33	702,00
2007	91	-140,80	400,68	-5,55	-2655,10	628,00
RAGL						
2005	91	15,93	92,79	1,20	-418,00	730,30
2006	91	-1,91	143,93	1,00	-853,00	690,00
2007	91	-14,33	132,67	0,00	-608,00	628,00
NI						
2005	91	1808,96	2959,32	832,00	15,80	22175,05
2006	91	1999,01	2892,50	928,25	-61,00	19943,74
2007	91	2248,94	3327,59	1019,90	-3477,00	21690,52
BVE						
2005	91	10570,36	13391,18	5357,00	407,10	82688,00
2006	91	12145,74	15380,57	5972,00	-2060,60	87128,31
2007	91	13022,73	16105,50	6597,00	-2072,90	85582,66

**Table 2 (cont.)
Descriptive statistics**

Companies	N	Mean	Std deviation	Median	Minumum	Maximum
Equity method						
PVO						
2005	15	3418,30	5745,05	1457,40	4,10	21446,00
2006	30	3341,89	4823,17	1404,50	3,90	20358,00
2007	36	3431,40	5511,67	1230,00	5,40	25425,00
FVA						
2005	15	2197,43	4032,21	918,00	0,00	16006,00
2006	30	2350,57	3619,28	1094,90	0,00	17278,00
2007	36	2835,34	5459,62	742,50	0,00	28231,00
L						
2005	15	1236,01	2062,42	405,00	-15,00	6654,00
2006	30	998,18	1682,25	260,35	-651,00	6429,00
2007	36	715,11	1310,99	139,25	-940,00	5818,00
AGL						
2005	15	57,72	224,88	33,00	-418,00	730,30
2006	30	-32,43	246,86	-2,90	-853,00	690,00
2007	36	-45,33	207,02	-3,45	-608,00	628,00
RAGL						
2005	15	55,52	225,30	31,00	-418,00	730,30
2006	30	-32,78	246,80	-2,90	-853,00	690,00
2007	36	-42,56	208,29	-0,90	-608,00	628,00
NI						
2005	15	1233,91	1364,43	689,00	221,00	4806,00
2006	30	1336,38	1526,50	729,05	115,00	5758,00
2007	36	1365,41	1756,57	919,00	-3477,00	6391,00
BVE						
2005	15	8529,35	9418,69	6388,60	1099,00	39288,00
2006	30	9520,60	11716,60	5913,50	1196,00	50166,00
2007	36	9893,09	10963,29	6551,45	1214,00	48913,00

**Table 2 (cont.)
Descriptive statistics**

Companies	N	Mean	Std deviation	Median	Minumum	Maximum
Corridor method						
PVO						
2005	72	3465,80	6703,14	1106,90	4,10	47014,22
2006	59	4109,40	7900,11	1119,90	4,20	45675,56
2007	53	3686,96	6967,11	965,00	3,80	42478,13
FVA						
2005	72	2417,93	5876,92	413,80	1,60	46147,01
2006	59	3355,43	7920,83	472,00	1,30	51149,08
2007	53	3121,36	7540,74	659,30	1,50	51768,92
UAGL						
2005	72	194,80	462,77	21,75	-710,00	2541,00
2006	59	20,43	781,49	11,70	-4993,70	2425,00
2007	53	-168,08	1083,02	-7,30	-7703,04	597,00
L						
2005	72	854,43	1894,16	355,00	-966,00	14572,00
2006	59	762,49	1940,62	260,00	-1155,00	13896,00
2007	53	710,91	2063,41	204,40	-1593,19	13760,00
AGL						
2005	72	118,71	299,18	15,10	-743,08	1770,00
2006	59	-140,50	647,16	-2,50	-4697,33	702,00
2007	53	-213,33	487,68	-15,00	-2655,10	159,90
RAGL						
2005	72	6,06	18,12	1,00	-77,20	68,00
2006	59	12,81	30,24	2,20	-7,10	151,00
2007	53	3,30	17,15	0,70	-53,00	71,00
NI						
2005	72	1933,99	3201,48	879,00	95,00	22175,05
2006	59	2273,28	3308,14	999,30	-61,00	19943,74
2007	53	2810,68	3973,28	1090,00	128,00	21690,52
BVE						
2005	72	10809,67	13491,24	5337,75	407,10	82688,00
2006	59	12879,27	16007,98	6069,00	-2060,60	87128,31
2007	53	14391,18	17472,70	6597,00	-2072,90	85582,66

**Table 2 (cont.)
Descriptive statistics**

Companies	N	Mean	Std deviation	Median	Minumum	Maximum
Profit or loss method						
PVO						
2005	4	1222,13	1206,15	1178,40	92,70	2439,00
2006	2	1311,60	1802,27	1311,60	37,20	2586,00
2007	2	1749,05	2446,52	1749,05	19,10	3479,00
FVA						
2005	4	469,18	813,73	94,85	0,00	1687,00
2006	2	876,60	1235,17	876,60	3,20	1750,00
2007	2	986,55	1390,81	986,55	3,10	1970,00
L						
2005	4	752,95	935,03	450,65	36,50	2074,00
2006	2	434,75	567,45	434,75	33,50	836,00
2007	2	768,60	1047,08	768,6	28,20	1509,00
AGL						
2005	4	45,05	48,17	40,80	1,60	97,00
2006	2	27,00	43,84	27,00	-4,00	58,00
2007	2	26,50	43,13	26,5	-4,00	57,00
RAGL						
2005	4	45,05	48,17	40,80	1,60	97,00
2006	2	27,00	43,84	27,00	-4,00	58,00
2007	2	26,50	43,13	26,5	-4,00	57,00
NI						
2005	4	1714,80	3070,55	265,20	15,80	6313,00
2006	2	3847,25	5121,93	3847,25	225,50	7469,00
2007	2	3266,35	4554,69	3266,35	45,70	6487,00
BE						
2005	4	13916,68	24918,49	2004,60	422,50	51235,00
2006	2	29883,60	39735,72	29883,60	1786,20	57981,00
2007	2	33092,50	44780,37	33092,5	1428,00	64757,00

Sample includes 91 European companies listed in EURONEX 100. PVO is the present value of the defined benefit obligation. FVA is the fair value of plan assets. UAGL is unrecognised actuarial gains and losses under corridor method. L is the amount recognized as a defined benefit liability. AGL is the actuarial gains and losses of the period. RAGL is the actuarial gains and losses recognized in profit or loss (corridor method and profit or loss method) or in equity (equity recognition method). A negative amount means a net actuarial gain and positive amount means a net actuarial loss. NI is net income and BE is the book value of equity. Amounts are in million of euros.

Table 3
Pearson Correlations

Panel A: Pooled across years (n=273)

Variables	PVO	FVPA	UAGL	L	AGL	RAGL	BVE	NI	MVE
PVO	1,000								
FVPA	0,951	1,000							
UAGL	0,076	0,017	1,000						
L	0,892	0,751	-0,081	1,000					
AGL	-0,649	-0,702	0,246	-0,551	1,000				
RAGL	0,197	0,167	0,087	0,203	0,009	1,000			
BVE	0,652	0,605	-0,489	0,743	-0,598	0,014	1,000		
NI	0,674	0,674	-0,469	0,699	-0,755	0,027	0,916	1,000	
MVE	-0,051	-0,076	0,040	-0,006	0,061	-0,019	0,072	0,124	1,000

Panel B: 2005 (n=91)

	PVO	FVPA	UAGL	L	AGL	RAGL	BVE	NI	MVE
PVO	1,000								
FVPA	0,951	1,000							
UAGL	0,076	0,017	1,000						
L	0,892	0,751	-0,081	1,000					
AGL	-0,649	-0,702	0,246	-0,551	1,000				
RAGL	0,197	0,167	0,087	0,203	0,009	1,000			
BVE	0,652	0,605	-0,489	0,743	-0,598	0,014	1,000		
NI	0,674	0,674	-0,469	0,699	-0,755	0,027	0,916	1,000	
MVE	-0,051	-0,076	0,040	-0,006	0,061	-0,019	0,072	0,124	1,000

Panel C: 2006 (n=91)

	PVO	FVPA	UAGL	L	AGL	RAGL	BVE	NI	MVE
PVO	1,000								
FVPA	0,951	1,000							
UAGL	0,076	0,017	1,000						
L	0,892	0,751	-0,081	1,000					
AGL	-0,649	-0,702	0,246	-0,551	1,000				
RAGL	0,197	0,167	0,087	0,203	0,009	1,000			
BVE	0,652	0,605	-0,489	0,743	-0,598	0,014	1,000		
NI	0,674	0,674	-0,469	0,699	-0,755	0,027	0,916	1,000	
MVE	-0,051	-0,076	0,040	-0,006	0,061	-0,019	0,072	0,124	1,000

Panel D: 2007 (n=91)

	PVO	FVPA	UAGL	L	AGL	RAGL	BVE	NI	MVE
PVO	1,000								
FVPA	0,951	1,000							
UAGL	0,076	0,017	1,000						
L	0,892	0,751	-0,081	1,000					
AGL	-0,649	-0,702	0,246	-0,551	1,000				
RAGL	0,197	0,167	0,087	0,203	0,009	1,000			
BVE	0,652	0,605	-0,489	0,743	-0,598	0,014	1,000		
NI	0,674	0,674	-0,469	0,699	-0,755	0,027	0,916	1,000	
Coluna 9	-0,051	-0,076	0,040	-0,006	0,061	-0,019	0,072	0,124	1,000

Sample includes 91 European companies listed in EURONEX 100. PVO is the present value of the defined benefit obligation. FVA is the fair value of plan assets. UAGL is unrecognised actuarial gains and losses under corridor method. L is the amount recognised as a defined benefit liability. AGL is the actuarial gains and losses of the period. RAGL is the

actuarial gains and losses recognized in profit or loss (corridor method and profit or loss method) or in equity (equity recognition method). A negative amount means a net actuarial gain and positive amount means a net actuarial loss. NI is net income; BVE is the book value of equity and MVE is the market value of equity at the year end. Amounts are in million of euros deflated by the number of shares outstanding at the year end.

Table 4
Regression results (all companies)

Panel A: regression results for the equity recognition method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	273	29,937	13,070***	2,194	5,572***	0,272	4,050***	0,363
2005	91	23,215	8,120***	1,016	1,496	0,619	4,698***	0,495
2006	91	32,598	7,053***	3,387	4,221***	0,131	0,773	0,392
2007	91	34,473	7,692***	1,506	2,252**	0,243	2,639**	0,255

Panel B: regression results for the profit or loss method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	273	31,017	13,317***	2,091	5,306***	0,249	3,697***	0,330
2005	91	28,382	8,958***	1,530	2,070**	0,319	2,385**	0,330
2006	91	32,025	6,795***	2,882	3,633***	0,216	1,258	0,369
2007	91	33,630	7,599***	1,371	2,146**	0,267	2,986***	0,270

Panel C: regression results for the corridor method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	184	31,438	10,054***	2,274	4,411***	0,159	2,048**	0,264
2005	72	29,556	8,214***	2,503	3,091***	0,113	0,768	0,336
2006	59	30,410	4,628***	5,382	3,947***	-0,190	-0,825	0,327
2007	53	35,374	5,248***	1,048	1,291	0,232	2,208**	0,194

Panel A presents regression summary statistics corresponding to valuation equations (1b), (2a) and (3b) (book value of equity and net income under the equity recognition method). Panel B presents regression summary statistics corresponding to valuation equations (1c), (2b) and (3a) (book value of equity and net income under the profit or loss method) and panel C presents regression results corresponding to valuation equation (1a) (book value of equity and net income under the corridor method). All companies of the sample are included in the regression tests. The dependent variable is the market value of equity at the year end (MVE); NI is net income and BVE is the book value of equity. *, **, *** Significant at the 10%, 5% and 1% levels of significance, respectively.

Table 5
Regression results (companies adopted corridor method)

Panel A: regression results for the equity recognition method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	184	30,099	10,032***	2,394	5,372***	0,185	2,423**	0,340
2005	72	24,071	7,255***	1,033	1,376	0,577	3,692***	0,481
2006	59	33,274	5,275***	4,093	4,412***	-0,087	-0,414	0,419
2007	53	35,302	5,230***	1,081	1,329	0,227	2,161**	0,193

Panel B: regression results for the profit or loss method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	184	31,440	10,200***	2,152	4,849***	0,176	2,294**	0,300
2005	72	30,714	8,351***	1,840	2,302**	0,192	1,263	0,299
2006	59	32,289	4,945***	3,509	3,755***	0,020	0,094	0,380
2007	53	35,572	5,159***	0,909	1,134	0,243	2,321**	0,188

Panel C: regression results for the corridor method

Year	n	Constant		NI		BVE		Adj R ²
		coef	t-stat	coef	t-sta	coef	t-stat	
Pooled	184	31,438	10,054***	2,274	4,411***	0,159	2,048**	0,264
2005	72	29,556	8,214***	2,503	3,091***	0,113	0,768	0,336
2006	59	30,410	4,628***	5,382	3,947***	-0,190	-0,825	0,327
2007	53	35,374	5,248***	1,048	1,291	0,232	2,208**	0,194

Panel A presents regression summary statistics corresponding to valuation equations (1b), (2a) and (3b) (book value of equity and net income under the equity recognition method). Panel B present s regression summary statistics corresponding to valuation equations (1c), (2b) and (3a) (book value of equity and net income under the profit or loss method) and panel C presents regressions results corresponding to valuation equation (1a) (book value of equity and net income under the corridor method). Only the companies included in my sample that adopted the corridor method are included in the regression tests. The dependent variable is the market value of equity at the year end (MVE); NI is net income and BVE is the book value of equity. *, **, *** Significant at the 10%, 5% and 1% levels of significance, respectively.