

**Fair value or cost-based measurement for PPE and IP:
evidence from accounting practice under IFRS**

**Maria José Fonseca
Faculdade de Economia e Gestão
Universidade Católica Portuguesa**

April 2007

Comments welcome (mfonseca@porto.ucp.pt)

Abstract

Some standards permit a choice between different measurement bases. IAS 16 and IAS 40 allow entities to choose between fair value and cost-based measurement for property, plant and equipment (PPE) and investment property (IP), respectively.

This study analyzes the accounting practice concerning measurement of PPE and IP after recognition, under IFRS. The sample was extracted from stock exchange listed European companies included in the S&P Europe 350 Index. Data was hand collected from firm's annual reports for the years of 2004 and 2005.

Findings indicate great resistance to the fair value model. The preference for historical cost model is almost unanimous among European firms that prepared their consolidated financial statements in compliance with IFRS for the first time in 2005. Results seem to be consistent with the explanation that invokes the familiarity as being one of the reasons underlying the preparers' preference for historical cost. That is, firms that applied historical cost model under former GAAP tend to carry on with historical cost under IFRS. Firms that had revaluated fixed assets before or at the transition date are more likely to adopt fair value model under IFRS. However, most of the companies that reported tangible fixed assets revaluations under previous GAAP shift to historical model under IFRS.

1. Introduction

This paper documents the accounting practice concerning measurement of property, plant and equipment (PPE) and investment property (IP) among European firms that prepared their consolidated financial statements in compliance with IFRS for the first time in 2005.

The measurement basis most commonly adopted by enterprises in preparing their financial statements is historical cost. This is usually combined with other measurement bases (IASB Framework §101). Increasingly historical cost is being replaced by fair value as recent accounting standards frequently permit or require assets to be stated at fair value.

After initial measurement, IAS 16 permits to choose between two accounting models for PPE: cost model or revaluation model. Under the revaluation model, revaluations should be carried out regularly, so that the carrying amount of an asset does not differ materially from its fair value at the balance sheet date. If an item is revaluated, the entire class of assets to which that asset belongs should be revaluated. If revaluation results in an increase in value, it should be credit to equity as 'revaluation surplus' unless it represents the reversal of a revaluation decrease of the same asset previously recognised as an expense, in which case it should be recognised as income. A decrease arising as a result of a revaluation should be recognised as an expense to the extent that it exceeds any amount previously credited to the revaluation surplus relating to the same asset.

According to IAS 40, an entity must choose between a fair value model and a cost model for measurement of IP subsequent to initial recognition. One method must be

adopted for all of an entity's investment property. Under the fair value model, gains and losses arising from changes in the fair value of IP must be included in net profit or loss for the period in which it arises.

Advocates of fair value accounting model believe that fair value provides more relevant measures of assets, liabilities and earnings than historical costs provide. They point out the inability of the historical cost accounting model to deal with the effects of changing prices of non-monetary assets.

Critics of fair value accounting mention that fair value estimates reduce reliability. For them historical cost has many advantages: it is familiar, it has a high degree of objectivity and it reflects the transactions actually engaged in by the entity, rather than hypothetical alternatives.

The IASB published a Discussion Paper (2005) 'Measurement Bases for Financial Accounting – Measurement on Initial Recognition' where fair value is reasoned to be the most relevant measurement basis provided it can be reliably measured. The Discussion Paper analyzes possible measurement bases that could be used to value an asset or liability when it is first included on the balance sheet but it is difficult to isolate this question from the wider issue of how an item should be stated at any later stage (ASB [2006]). While standard setters such as IASB tend to reinforce the use of fair value in accounting measurement with little public debate outside specialized financial circles (Perry and Nölke [2006]), preparers of financial statements seem to be reluctant in applying it.

All stock exchange listed companies in the European Union are required to prepare their consolidated financial statements in accordance with IFRS for years beginning on or after January 1, 2005 (Regulation (EC) 1606/2002). This study investigates the extent to which at the transition date European firms elected fair value for measure PPE and IP and the link between this choice and the practice under former GAAP.

The possibility of revaluing long-lived assets to reflect market prices as permitted by IAS 16 and IAS 40 is controversial. Under previous GAAP, before the transition to IFRS, some European firms do not revalue, some revalue on a stated cycle and some revalue on an ad hoc basis, either to fair value or to price-index-adjusted cost. Findings indicate that the preference for historical cost model among first adopters of IFRS is almost unanimous. Empirical evidence seems to be consistent with the explanation that invokes the familiarity of historical cost as being one of the reasons for the preparers' choice.

The rest of the paper is organized as follows. Section 2 introduces the sample and presents summary statistics. Section 3 contains the cluster analysis. Section 4 presents the results of the discriminant analysis. Section 5 concludes.

2. Sample Firms and Data

The sample was extracted from the 350 listed European companies included in the S&P Europe 350 Index. This index provides broad market representation of leading companies from the leading 17 stock markets across Europe - the 12 members of the Euro zone plus Denmark, Norway, Sweden, Switzerland and the United Kingdom.

Data was hand collected from firm's annual reports for the years of 2004 and 2005. We exclude the firms that do not present those annual reports in their websites and we also exclude the firms whose annual accounts for the year of 2005 have not been prepared in accordance with the International Financial Accounting Standards. Final sample comprises 288 firms. From this sample of 288 firms (full sample) only 84 reported investment properties (sub-sample).

Table 1 presents economic sector breakdowns of the sample firms. It reveals that financial industries dominate the sample representing 26% of full the sample and 56% of the sub-sample.

Table 1: Sample composition by economic sector					
Full sample			Sub-sample: firms reporting IP		
Sector	NC	%	Sector	NC	%
1: Energy	6	2	6: Health Care	0	0
8: Information Technology	11	4	8: Information Technology	0	0
6: Health Care	12	4	1: Energy	2	2
9: Telecommunications Services	15	5	9: Telecommunications Services	2	2
10:Utilities	19	7	10:Utilities	3	4
5: Consumer Staples	21	7	2: Materials	5	6
2: Materials	30	10	5: Consumer Staples	7	8
3: Industrials	48	17	3: Industrials	9	11
4: Consumer Discretionary	52	18	4: Consumer Discretionary	9	11
7: Financials	74	26	7: Financials	47	56
TOTAL	288	100	TOTAL	84	100

NC – number of companies by economic sector.

Table 2 presents sample firms composition by country. It reveals that firms from Great Britain dominate the sample representing 36% of full sample and 26% of sub-sample.

Table 2: Sample composition by country					
Full sample			Sub-sample: firms reporting IP		
Country	NC	%	Country	NC	%
Denmark	2	1	Denmark	0	0
Greece	3	1	Finland	1	1
Finland	4	1	Norway	1	1
Norway	4	1	Ireland	1	1
Ireland	5	2	Portugal	1	1
Portugal	6	2	Greece	2	2
Belgium	9	3	Sweden	2	2
Netherlands	15	5	Belgium	4	5
Spain	16	6	Netherlands	4	5
Switzerland	17	6	Switzerland	6	7
Sweden	18	6	Germany	9	11
Italy	22	8	France	9	11
Germany	26	9	Italy	10	12
France	38	13	Spain	12	14
Great Britain	103	36	Great Britain	22	26
TOTAL	288	100	TOTAL	84	100

NC – number of companies by country

From firm's annual reports to shareholders we obtain the following information for each company:

- Previous GAAP [**GAAP**]: the accounting standards followed before the transition to IFRS;
- Fair value as deemed cost [**FVIFRS**]: The firm (group)'s option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, *First-time adoption of IFRS*;
- Revaluated amount as deemed cost [**REVBEP**]: The firm (group)'s option concerning the possibility to elect the revaluated carrying amounts of PPE and IP under former GAAP as deemed cost, as permitted by IFRS 1, *First-time adoption of IFRS*;
- The accounting model chosen for measurement of PPE under IAS 16, after the transition date [**PPE**];
- The accounting model chosen for measurement of IP under IAS 40, after the transition date [**IP**].

Companies' economic sectors [**SECTOR**] were collected from S&P Europe 350 Index data provided by Standard & Poor's.

Table 3 shows the results of the nonparametric test Kendall's tau-b for the full sample.

Table 3: Correlations – full sample

			FVIFRS	GAAP	IP	PPE	REVBEP	SECTOR
Kendall's tau_b	FVIFRS	Correlation Coefficient	1,000	-,038	-,140(*)	,275(**)	,147(*)	,098
		Sig. (2-tailed)	.	,459	,015	,000	,013	,056
		N	288	288	288	288	288	288
	GAAP	Correlation Coefficient	-,038	1,000	,110(*)	,033	,143(**)	-,017
		Sig. (2-tailed)	,459	.	,029	,526	,006	,704
		N	288	288	288	288	288	288
	IP	Correlation Coefficient	-,140(*)	,110(*)	1,000	-,151(**)	-,269(**)	-,102(*)
		Sig. (2-tailed)	,015	,029	.	,008	,000	,043
		N	288	288	288	288	288	288
	PPE	Correlation Coefficient	,275(**)	,033	-,151(**)	1,000	,224(**)	,113(*)
		Sig. (2-tailed)	,000	,526	,008	.	,000	,028
		N	288	288	288	288	288	288
	REVBEP	Correlation Coefficient	,147(*)	,143(**)	-,269(**)	,224(**)	1,000	,153(**)
		Sig. (2-tailed)	,013	,006	,000	,000	.	,003
		N	288	288	288	288	288	288
	SECTOR	Correlation Coefficient	,098	-,017	-,102(*)	,113(*)	,153(**)	1,000
		Sig. (2-tailed)	,056	,704	,043	,028	,003	.
		N	288	288	288	288	288	288

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

At the 0,05 level we can not reject the hypotheses of independence between the following variables: FVIFRS and GAAP; FVIFRS and SECTOR; GAAP and PPE; GAAP and SECTOR. That is, at the 0,05 level we can not reject the hypotheses of independence between:

- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' previous GAAP;
- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' economic sector;
- companies' accounting model chosen for PPE under IAS 16, after the transition date, and companies' previous GAAP.

Table 4 shows the results of the nonparametric test Kendall's tau-b for the sub-sample.

Table 4: Correlations – sub-sample

			FVIFRS	GAAP	IP	PPE	REVBEP	SECTOR
Kendall's tau_b	FVIFRS	Correlation Coefficient	1,000	,063	,032	,189	,276(*)	,142
		Sig. (2-tailed)	.	,510	,771	,086	,012	,158
		N	84	84	84	84	84	84
	GAAP	Correlation Coefficient	,063	1,000	,267(**)	,138	,163	-,016
		Sig. (2-tailed)	,510	.	,005	,146	,086	,853
		N	84	84	84	84	84	84
	IP	Correlation Coefficient	,032	,267(**)	1,000	,532(**)	,075	,341(**)
		Sig. (2-tailed)	,771	,005	.	,000	,495	,001
		N	84	84	84	84	84	84
	PPE	Correlation Coefficient	,189	,138	,532(**)	1,000	,293(**)	,195
		Sig. (2-tailed)	,086	,146	,000	.	,008	,053
		N	84	84	84	84	84	84
	REVBEP	Correlation Coefficient	,276(*)	,163	,075	,293(**)	1,000	,178
		Sig. (2-tailed)	,012	,086	,495	,008	.	,076
		N	84	84	84	84	84	84
	SECTOR	Correlation Coefficient	,142	-,016	,341(**)	,195	,178	1,000
		Sig. (2-tailed)	,158	,853	,001	,053	,076	.
		N	84	84	84	84	84	84

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

At the 0,05 level we can not reject the hypotheses of independence between the following variables: FVIFRS and GAAP; FVIFRS and IP; FVIFRS and PPE; FVIFRS and SECTOR; GAAP and PPE; GAAP and REVBEP; GAAP and SECTOR; IP and REVBEP; PPE and SECTOR; REVBEP and SECTOR.

So, at the 0,05 level we can not reject the hypotheses of independence between:

- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' former GAAP;
- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' accounting model chosen for IP under IAS 40, after the transition date;
- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' accounting model chosen for PPE under IAS 16, after the transition date;
- companies' option concerning the possibility to restate PPE and IP at their fair value at the transition date, as permitted by IFRS 1, and companies' economic sector;
- companies' accounting model chosen for PPE under IAS 16, after the transition date, and companies' previous GAAP;
- companies' option concerning the possibility to elect the revaluated carrying amounts of PPE and IP under former GAAP as deemed cost, as permitted by IFRS 1, and companies' previous GAAP;
- companies' option concerning the possibility to elect the revaluated carrying amounts of PPE and IP under former GAAP as deemed cost, as permitted by IFRS 1, and companies' accounting choice for IP under IAS 40, after the transition date;
- companies' accounting model chosen for PPE under IAS 16, after the transition date, and companies' economic sector;
- companies' option concerning the possibility to elect the revaluated carrying amounts of PPE and IP under former GAAP as deemed cost, as permitted by IFRS 1, and companies' economic sector.

3. Cluster Analysis

This procedure attempts to identify relatively homogeneous groups of cases based on selected characteristics [PPE, REVBEP, FVIFRS, IP], using an algorithm that can handle large numbers of cases.

In section 3.1 we present the results for the full sample. Section 3.2 contains the results for the sub-sample.

3.1 Cluster Analysis – full sample

The results of the classification into clusters (K-Means Clusters) made with the software SPSS 14.0 for the full sample, considering two cluster centers, are presented in tables 5 and 6.

Cluster 1 includes 267 companies (93%) and cluster 2 comprises 21 companies (7%). The attribute that seems to distinguish the firms belonging to cluster 1 from the others, is their persistent preference for historical cost model for PPE before and after the transition to IFRS.

Table 5: Final Cluster Centers

	Cluster	
	1	2
PPE	1	2
REVBEP	1	2
FVIFRS	1	2

PPE 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP 1: cost model under previous GAAP
 2: revaluation model under previous GAAP
 FVIFRS 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 6: Number of Cases in each Cluster

Cluster	1	267,000
	2	21,000
Valid		288,000
Missing		,000

We proceed the analysis considering three cluster centers. The results of the classification are the following:

Table 7: Final Cluster Centers

	Cluster		
	1	2	3
PPE	1	2	1
REVBEP	1	2	2
FVIFRS	1	1	2

PPE 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP 1: cost model under previous GAAP
 2: revaluation model under previous GAAP
 FVIFRS 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 8: Number of Cases in each Cluster

Cluster	1	259,000
	2	11,000
	3	18,000
Valid		288,000
Missing		,000

As shown in tables 7 and 8, cluster 1 comprises 259 firms (90%). The persistent preference for historical cost model before and after the transition to IFRS continues to be the characteristic that seems to differentiate those firms belonging to cluster 1 from the others.

In order to analyze the sample with major detail we enlarge the number of clusters to seven (upper limit). The results are the following:

Table 9: Final Cluster Centers

	Cluster						
	1	2	3	4	5	6	7
PPE	1	2	2	1	1	1	2
REVBEP	1	2	2	2	2	1	1
FVIFRS	1	2	1	2	1	2	2

PPE
 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP
 1: cost model under previous GAAP
 2: revaluation model under previous GAAP
 FVIFRS
 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 10: Number of Cases in each Cluster

Cluster	1	173,000
	2	4,000
	3	6,000
	4	10,000
	5	86,000
	6	8,000
	7	1,000
Valid		288,000
Missing		,000

Of the full sample, 277 companies (96%) elected the historical cost model for PPE under IAS 16 – clusters 1, 4, 5 and 6 – and only 11 firms (4%) choose the revaluation model for all or some classes of PPE, under IAS 16 - clusters 2, 3 and 7.

Regarding the 277 companies that adopt historical cost model for PPE, table 11 shows that 181 of them (65%) were using historical cost model for PPE before the transition – clusters 1 and 6 - and 96 of them (35%) has been applying revaluation model under former GAAP – clusters 4 and 5.

Table 11: REVBEP * PPE Crosstabulation

			PPE		Total
			1	2	
REVBEP	1	Count	181	1	182
		% within REVBEP	99,5%	,5%	100,0%
		% within PPE	65,3%	9,1%	63,2%
	2	Count	96	10	106
		% within REVBEP	90,6%	9,4%	100,0%
		% within PPE	34,7%	90,9%	36,8%
Total		Count	277	11	288
		% within REVBEP	96,2%	3,8%	100,0%
		% within PPE	100,0%	100,0%	100,0%

PPE
 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP
 1: cost model under previous GAAP
 2: revaluation model under previous GAAP

Amongst the companies that were using historical cost model for PPE under former GAAP, all but one (99,5%) carry on with historical cost under IAS 16 (table 11). Considering the companies that were using revaluation model under former GAAP, 96 of them (90,6%) choose historical model for PPE under IAS 16 (table 11).

These findings suggest a great preference for cost model among first adopters of IFRS and they are consistent with empirical evidence presented by Benabdellah and Teller (2006) regarding a sample of French companies.

As shown in table 12, considering the 23 firms that restated some or all classes of PPE and IP at their fair value at the transition date, as permitted by IFRS 1, 18 of them (78%) choose historical cost model for PPE under IAS 16 after the transition date – clusters 4 and 6 – and only 5 of them (22%) elected the revaluation model for PPE after the transition date – clusters 2 and 7.

Table 12: FVIFRS * PPE Crosstabulation

			PPE		Total
			1	2	
FVIFRS 1	Count		259	6	265
	% within FVIFRS		97,7%	2,3%	100,0%
	% within PPE		93,5%	54,5%	92,0%
2	Count		18	5	23
	% within FVIFRS		78,3%	21,7%	100,0%
	% within PPE		6,5%	45,5%	8,0%
Total	Count		277	11	288
	% within FVIFRS		96,2%	3,8%	100,0%
	% within PPE		100,0%	100,0%	100,0%

PPE
 1: cost model under IAS 16
 2: revaluation model under IAS 16
 FVIFRS
 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

As mentioned before, of the full sample only 11 firms (4%) choose the revaluation model for all or some classes of PPE, under IAS 16 - clusters 2, 3 and 7.

Table 13 shows that 10 of them (91%) are financial firms (economic sector number 7). Those ten firms reported fixed asset revaluation before the transition date under UK GAAP. The other firm remaining belongs to the consumer discretionary sector (economic sector number 4). This company was using the historical cost model for PPE under previous GAAP and restated some items of PPE at the transition date, as permitted by IFRS 1.

Table13: PPE * SECTOR Crosstabulation

		SECTOR										Total
		1	2	3	4	5	6	7	8	9	10	
PPE 1	Count	6	30	48	51	21	12	64	11	15	19	277
	% within PPE	2,2%	10,8%	17,3%	18,4%	7,6%	4,3%	23,1%	4,0%	5,4%	6,9%	100,0%
	% within SECTOR	100,0%	100,0%	100,0%	98,1%	100,0%	100,0%	86,5%	100,0%	100,0%	100,0%	96,2%
2	Count	0	0	0	1	0	0	10	0	0	0	11
	% within PPE	,0%	,0%	,0%	9,1%	,0%	,0%	90,9%	,0%	,0%	,0%	100,0%
	% within SECTOR	,0%	,0%	,0%	1,9%	,0%	,0%	13,5%	,0%	,0%	,0%	3,8%
Total	Count	6	30	48	52	21	12	74	11	15	19	288
	% within PPE	2,1%	10,4%	16,7%	18,1%	7,3%	4,2%	25,7%	3,8%	5,2%	6,6%	100,0%
	% within SECTOR	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
Total	Count	6	30	48	52	21	12	74	11	15	19	288
	% within PPE	2,1%	10,4%	16,7%	18,1%	7,3%	4,2%	25,7%	3,8%	5,2%	6,6%	100,0%
	% within SECTOR	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%

- 1: Energy
- 2: Materials
- 3: Industrials
- 4: Consumer Discretionary
- 5: Consumer Staples
- 6: Health Care
- 7: Financials
- 8: Information Technology
- 9: Telecommunications Services
- 10: Utilities

3.2 Cluster Analysis – sub-sample

As mentioned before, of the full sample only 84 firms reported investment properties. We proceed with the cluster analysis for this sub-sample. The results of the classification into clusters (K-Means Clusters) made with the software SPSS 14.0, considering two cluster centers, are the following:

Table 14: Final Cluster Centers

	Cluster	
	1	2
IP	1	1
REVBEP	1	2
FVIFRS	1	1

- PPE 1: cost model under IAS 16
2: revaluation model under IAS 16
- REVBEP 1: cost model under previous GAAP
2: revaluation model under previous GAAP
- FVIFRS 1: carrying amount under previous GAAP, at the transition date
2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 15: Number of Cases in each Cluster

Cluster	1	47,000
	2	37,000
Valid		84,000
Missing		,000

As shown in tables 14 and 15, cluster 1 includes 46 companies (56%) and cluster 2 comprises 37 companies (44%). Findings are consistent with the results presented for the full sample. That is, the relevant factor that seems to distinguish the firms belonging to cluster 1 from the others is the persistent preference for historical cost model for IP, before and after the transition to IFRS.

We proceed the analysis considering three cluster centers. The results of the classification are the following:

Table 16: Final Cluster Centers

	Cluster		
	1	2	3
IP	1	2	1
REVBEP	1	2	2
FVIFRS	1	1	2

PPE 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP 1: cost model under previous GAAP
 2: revaluation model under previous GAAP
 FVIFRS 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 17: Number of Cases in each Cluster

Cluster	1	60,000
	2	16,000
	3	8,000
Valid		84,000
Missing		,000

As presented in tables 16 and 17, cluster 1 comprises 60 firms (71%) and their distinctive characteristic continues to be the regular choice for historical cost model for IP, before and after the transition to IFRS.

Introducing the variable PPE in the analysis the results remain similar, as shown in tables 18 and 19:

Table 18: Final Cluster Centers

	Cluster		
	1	2	3
IP	1	2	1
PPE	1	2	1
REVBEP	1	2	2
FVIFRS	1	1	2

IP 1: cost model under IAS 40 (IAS 16)
 2: fair value model under IAS 40
 PPE 1: cost model under IAS 16
 2: revaluation model under IAS 16
 REVBEP 1: cost model under previous GAAP
 2: revaluation model under previous GAAP
 FVIFRS 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 19: Number of Cases in each Cluster

Cluster	1	60,000
	2	15,000
	3	9,000
Valid		84,000
Missing		,000

In order to analyze the sample with major detail we enlarge the number of cluster centers to nine (upper limit). The results are the following:

Table 20: Final Cluster Centers

	Cluster								
	1	2	3	4	5	6	7	8	9
IP	1	1	2	2	2	2	1	2	1
PPE	1	1	2	1	1	1	1	2	1
REVBEP	1	2	2	1	2	2	2	2	1
FVIFRS	1	1	1	1	1	2	2	2	2

IP
1: cost model under IAS 40 (IAS 16)
2: fair value model under IAS 40

PPE
1: cost model under IAS 16
2: revaluation model under IAS 16

REVBEP
1: cost model under previous GAAP
2: revaluation model under previous GAAP

FVIFRS
1: carrying amount under previous GAAP, at the transition date
2: FV as deemed cost at the transition date, as permitted by IFRS 1

Table 21: Number of Cases in each Cluster

Cluster	1	25,000
	2	26,000
	3	6,000
	4	9,000
	5	6,000
	6	1,000
	7	7,000
	8	3,000
	9	1,000
Valid		84,000
Missing		,000

Regarding the sub-sample, 59 companies (70%) elected the historical cost model for IP under IAS 40 (IAS 16) – clusters 1, 2, 7 and 9 – and 25 firms (30%) choose the fair value model for IP under IAS 40 - clusters 3, 4, 5, 6 and 8.

Amongst the 59 companies that adopt historical cost model for IP, table 20 shows that 26 of them (44%) were using historical cost before the transition – clusters 1 and 9 - and 33 of them (56%) had chosen revaluation model under former GAAP – clusters 2 and 7.

Concerning the companies that were using historical cost model for IP under former GAAP, 26 (74%) carry on with historical cost for IP under IAS 40 (IAS 16); only 9 of

them (26%) shift to fair value model for IP under IAS 40 (table 22). Considering the companies that were revaluating IP under former GAAP, 33 of them (67%) move to historical model for IP under IAS 40 (table 22).

Table 22: REVBEF * IP Crosstabulation

			IP		Total
			1	2	
REVBEF	1	Count	26	9	35
		% within REVBEF	74,3%	25,7%	100,0%
		% within IP	44,1%	36,0%	41,7%
		% of Total	31,0%	10,7%	41,7%
	2	Count	33	16	49
		% within REVBEF	67,3%	32,7%	100,0%
		% within IP	55,9%	64,0%	58,3%
		% of Total	39,3%	19,0%	58,3%
	Total	Count	59	25	84
		% within REVBEF	70,2%	29,8%	100,0%
% within IP		100,0%	100,0%	100,0%	
% of Total		70,2%	29,8%	100,0%	

IP
 1: cost model under IAS 40 (IAS 16)
 2: fair value model under IAS 40
 REVBEF
 1: cost model under previous GAAP
 2: revaluation model under previous GAAP

As presented in table 23, of the 12 firms that restated some or all classes of PPE and IP at their fair value at the transition date, as permitted by IFRS 1, 8 of them (67%) choose historical cost model for IP, under IAS 40 (IAS 16) – clusters 7 and 9 – and only 4 of them (33%) elected the fair value model after the transition to IFRS – clusters 6 and 8.

Table 23: FVIFRS * IP Crosstabulation

			IP		Total
			1	2	
FVIFRS	1	Count	51	21	72
		% within FVIFRS	70,8%	29,2%	100,0%
		% within IP	86,4%	84,0%	85,7%
		% of Total	60,7%	25,0%	85,7%
	2	Count	8	4	12
		% within FVIFRS	66,7%	33,3%	100,0%
		% within IP	13,6%	16,0%	14,3%
		% of Total	9,5%	4,8%	14,3%
	Total	Count	59	25	84
		% within FVIFRS	70,2%	29,8%	100,0%
% within IP		100,0%	100,0%	100,0%	
% of Total		70,2%	29,8%	100,0%	

IP
 1: cost model under IAS 40 (IAS 16)
 2: fair value model under IAS 40
 FVIFRS
 1: carrying amount under previous GAAP, at the transition date
 2: FV as deemed cost at the transition date, as permitted by IFRS 1

As mentioned before, 25 firms (30%) of the sub-sample choose the fair value model for IP under IAS 40 - clusters 3, 4, 5, 6 and 8. Table 24 shows that 23 of them (92%) are financial firms (economic sector number 7).

Table 24: IP * SECTOR Crosstabulation

		SECTOR								Total
		1	2	3	4	5	7	9	10	
IP 1	Count	2	4	9	9	7	24	2	2	59
	% within IP	3,4%	6,8%	15,3%	15,3%	11,9%	40,7%	3,4%	3,4%	100,0%
	% within SECTOR	100,0%	80,0%	100,0%	100,0%	100,0%	51,1%	100,0%	66,7%	70,2%
	% of Total	2,4%	4,8%	10,7%	10,7%	8,3%	28,6%	2,4%	2,4%	70,2%
2	Count	0	1	0	0	0	23	0	1	25
	% within IP	,0%	4,0%	,0%	,0%	,0%	92,0%	,0%	4,0%	100,0%
	% within SECTOR	,0%	20,0%	,0%	,0%	,0%	48,9%	,0%	33,3%	29,8%
	% of Total	,0%	1,2%	,0%	,0%	,0%	27,4%	,0%	1,2%	29,8%
Total	Count	2	5	9	9	7	47	2	3	84
	% within IP	2,4%	6,0%	10,7%	10,7%	8,3%	56,0%	2,4%	3,6%	100,0%
	% within SECTOR	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%	100,0%
	% of Total	2,4%	6,0%	10,7%	10,7%	8,3%	56,0%	2,4%	3,6%	100,0%

- | | |
|---------------------------|--------------------------------|
| 1: Energy | 6: Health Care |
| 2: Materials | 7: Financials |
| 3: Industrials | 8: Information Technology |
| 4: Consumer Discretionary | 9: Telecommunications Services |
| 5: Consumer Staples | 10: Utilities |

As presented in table 25, regarding those 25 firms that elected fair value model for IP, 9 of them (36%) choose the revaluation model for PPE – clusters 6 and 8. The other 16 firms (64%) elected the historical cost model for PPE under IFRS.

Table 25: PPE * IP Crosstabulation

		IP		Total
		1	2	
PPE 1	Count	59	16	75
	% within PPE	78,7%	21,3%	100,0%
	% within IP	100,0%	64,0%	89,3%
	% of Total	70,2%	19,0%	89,3%
2	Count	0	9	9
	% within PPE	,0%	100,0%	100,0%
	% within IP	,0%	36,0%	10,7%
	% of Total	,0%	10,7%	10,7%
Total	Count	59	25	84
	% within PPE	70,2%	29,8%	100,0%
	% within IP	100,0%	100,0%	100,0%
	% of Total	70,2%	29,8%	100,0%

- | | |
|-----|-------------------------------------|
| IP | 1: cost model under IAS 40 (IAS 16) |
| | 2: fair value model under IAS 40 |
| PPE | 1: cost model under IAS 16 |
| | 2: revaluation model under IAS 16 |

All of the 59 firms that choose historical cost model for PPE under IAS 16, also elected historical cost model for IP under IAS 40 (IAS16), after the transition date (table 25).

4. Discriminant Analysis

Discriminant analysis generates a discriminant function (or, for more than two groups, a set of discriminant functions) based on linear combinations of the predictor variables that provide the best discrimination between the groups. The functions are generated from a sample of cases for which group membership is known; the functions can then be applied to new cases that have measurements for the predictor variables but have unknown group membership. So, it can be useful also for building a predictive model of group membership based on observed characteristics of each case.

In section 4.1 we present the results for the full sample. Section 4.2 contains the results for the sub-sample.

4.1. Discriminant Analysis – full sample

The discriminant function was generated from the full sample of cases for which group membership concerning PPE is known. That is, grouping variable is PPE and independent variables are FVIFRS; REVBEF; SECTOR; GAAP; IP. The results for the discriminant analysis made with the software SPSS 14.0 are the following:

Table 26: Standardized Canonical Discriminant Function Coefficients

	Function
	1
FVIFRS	,738
REVBEF	,541
SECTOR	,197
GAAP	,028
IP	,011

Considering the standardized canonical discriminant function coefficients presented in table 26, the expression of the discriminant function Z_{fs} is:

$$Z_{fs} = 0,738 \text{ FVIFRS} + 0,541 \text{ REVBEF} + 0,197 \text{ SECTOR} + 0,028 \text{ GAAP} + 0,011 \text{ IP}$$

Table 27 shows the variables ordered by absolute size of correlation within the function. The variable that more contributes to the discriminant power of function Z_{fs} is FVIFRS (0,799). In the second place appears the variable REVBEF (0,639).

These findings are consistent with the cluster analysis results presented in previous section. Firms that applied historical cost model for PPE before the transition date tend to carry on with historical cost under IFRS (Table 11). Firms that had reevaluate fixed assets before or at the transition date are more likely to adopt fair value (revaluation) model after the transition date, under IFRS.

Table 27: Structure Matrix

	Function
	1
FVIFRS	,799
REVBEP	,639
SECTOR	,328
IP	-,221
GAAP	,092

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

The value assumed by Wilks' Lambda (Λ) statistic can be used as an inverse measure of the function's discriminant power. In the present case Λ is more close to 1 than to 0 (0,886) meaning that the function Z_{fs} does not have a strong discriminant power.

Table 28: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,886	34,309	5	,000

The discriminant function can be applied to new cases that have measurements for the predictor variables but have unknown group membership. Classification results indicates that 88,5% of original grouped cases would be correctly classified (table 29).

Table 29: Classification Results(a)

			Predicted Group Membership		Total
			1	2	
Original	Count	1	250	27	277
		2	6	5	11
	%	1	90,3	9,7	100,0
		2	54,5	45,5	100,0

a 88,5% of original grouped cases correctly classified.

The relative weakness of the discriminant power of function Z_{fs} is consistent with the fact that the variables included in this study do not comprehend a wide range of factors presented by literature as possible reasons for firms to reevaluate fixed assets. For example, Easton *et al* (1993) record the results of a telephone survey of Chief Financial Officers of their sample of Australian firms. According to their study, CFOs most often stated that the primary motivation for asset revaluations was to present true and fair financial statements as required by company law. Second most commonly cited primary motivation for asset revaluation was the need to reduce debt-to-equity ratios. Other explanations for the incidence of revaluations are reasoned to be that asset revaluations are undertaken as a takeover defence strategy to ensure that an underpriced bid is not successful and that asset revaluations lower the return on assets and hence exposure to labour unions, price control administrators, and tax authorities (Easton *et al.* [1993] p.9).

4.2 Discriminant Analysis – sub-sample

The discriminant function was generated from the sub-sample of cases for which group membership concerning IP is known. That is, grouping variable is IP and independent variables are FVIFRS; REVBEF; SECTOR; GAAP; PPE.

The results of the discriminant analysis made with the software SPSS 14.0 are the following:

Table 30: Standardized Canonical Discriminant Function Coefficients

	Function
	1
FVIFRS	-,179
REVBEF	-,317
SECTOR	,566
GAAP	,508
PPE	,847

Considering the standardized canonical discriminant function coefficients presented in table 30, the expression of the discriminant function Z_{ss} is:

$$Z_{ss} = -0,179 \text{ FVIFRS} - 0,317 \text{ REVBEF} + 0,566 \text{ SECTOR} + 0,508 \text{ GAAP} + 0,847 \text{ PPE}$$

Next table shows the variables ordered by absolute size of correlation within the function. The variable with the bigger contribute to the discriminant power of function Z_{ss} is PPE (0,721). In the second place appears the variable SECTOR (0,430).

Table 31: Structure Matrix

	Function
	1
PPE	,721
SECTOR	,430
GAAP	,354
REVBEF	,086
FVIFRS	,037

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions

Variables ordered by absolute size of correlation within function.

These findings are consistent with the cluster analysis results presented in previous section. All firms that choose historical cost model for IP under IAS 40 (IAS 16) also elected historical cost model for PPE under IAS 16, after the transition date (table 25). Regarding the 25 firms that elected fair value model for IP under IAS 40, 23 of them (92%) are financial firms (table 24).

The value of Wilks' Lambda (Λ) statistic is 0,568 (table 32).

Table 32: Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	,568	44,961	5	,000

Classification results indicate that 85,7% of original grouped cases would be correctly classified (table 33).

Table 33: Classification Results(a)

			Predicted Group Membership		Total
			1	2	
Original	Count	IP	1	2	
		1	52	7	59
		2	5	20	25
	%	1	88,1	11,9	100,0
		2	20,0	80,0	100,0

a 85,7% of original grouped cases correctly classified.

5. Conclusions

Previous research such as BARTH and CLINCH (1998) and EASTON et al (1993) support the conclusion that book values including asset revaluation reserves are more aligned with the market value of the firm than book values excluding asset revaluations. That is, asset revaluations help to provide true and fair information about the current state of the firm.

Nevertheless our empirical research on accounting practice suggests that firms tend to choose historical cost model despite accounting standards permit tangible fixed assets to be stated at fair value.

The preference for historical cost model is almost unanimous among European firms that prepared their consolidated financial statements in compliance with IFRS for the first time in 2005. Theses findings are consistent not only with evidence presented by Benabdellah and Teller (2006) concerning a sample of French companies but also with Watts' (2003) reasoning that accounting practice has been long and significant influenced by conservatism and has become more conservative in the last 30 years.

Considering a sample of 288 firms, 277 of them (96%) elected the historical cost model for PPE under IAS 16. Cluster analysis presented in section 3 suggests that the attribute that seems to characterize the great majority of firms is their persistent preference for historical cost model for fixed assets before and after the transition to IFRS.

Among the companies that were using historical cost model for PPE under former GAAP, all but one (99,5%) carry on with historical cost under IAS 16. On the other hand, discriminant analysis presented in section 4 suggests that financial firms who are more used to apply fair value in accounting measurement seem to be more

receptive to tangible fixed asset revaluation. Results seem to be consistent with the explanation that invokes the familiarity as being one of the reasons underlying the preparers' preference for historical cost.

That is, firms that applied historical cost model for PPE before the transition date tend to carry on with historical cost under IFRS. Firms that had revaluated fixed assets before or at the transition date are more likely to adopt fair value (revaluation) model under IFRS.

However, considering the companies that were using revaluation model under former GAAP, 91% of them shift to historical model for PPE under IAS 16. This alteration appears to contradict firms' general resistance to change accounting practice. More demanding disclosures under IFRS than under former GAAP may be one of the motivations underlying this adjustment. Another possible reason why revaluation model was abandoned at the transition date may reside in the fact that under former GAAP some firms used discretionary revaluations opportunistically and this practice is no longer possible under IFRS. Further research is needed to support these arguments.

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