Comparing the Value Relevance of Earnings and Book Value in IFRS and GAAP Standards

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The adoption of the IFRS[1] in 2005 by the listed European companies has, no doubt, proved to be a major event and a primordial step in the history of contemporary accounting. These new standards were created in order to provide a better comparability and transparency of financial accounts. They give priority to the pre-eminence of the economic reality over legal form by replacing, notably for financial instruments, the principal of historical cost valuation by that of fair value.

Today, the IFRS have succeeded in challenging its American rivals the US GAAP, the latter being no longer considered as the unique standards with an international dimension. Thus, the financial markets are dominated today by two systems based on different philosophies. The IAS/IFRS standards are based on more flexible principles, whilst the US GAAP are based on the very detailed and complex rules. In this context, a group of accounting and finance professionals sought a convergence between the US GAAP and the IFRS, which was formalised by the Norwalk agreement in 2002. This resulted in setting up a harmonisation project in order to eliminating the differences between the two standards. Meanwhile, the cohabitation is likely to persist for several years. This situation produced another group of professionals and researchers, motivated among other reasons, by the current upheaval and financial crisis, and who think that a great battle has started. They are questioning both the role of the IFRS in the current economic situation, and want to know which is the best frame of reference: the IAS/IFRS or the US GAAP?

The aim of this paper is to present a comparative analysis of the value relevance of earnings and equity across financial institutions, and more particularly for banks. The organisations present a very specific case study because they have problems accounting for the fair value of their financial assets creating volatility in their book value and equity.

The related studies found in the literature are based on comparisons between the US GAAP and one or more standards or accounting methods. For example, Hernandez *et al.* (2007), using the Gray (1980) conservative index, found a constant growth in the number of Latin American banks complying with the US GAAP, which leads to the belief that the US GAAP is more useful compared with local standards. The results of the study of Khurana and Kim (2003) carried out on a sample of American banks, show that the relation between the historic value of the financial instruments and the stock market price of the equity does not have any significant difference compared with the association of the fair value of the financial instruments and the stock market price of the equity. Among the studies carried out on companies other than banks, including those of Harris and Muller (1999) which found that the reconciliation table IAS/US GAAP presented in the forms 20-F provides a value relevance. Chen and Sami (2006) came to the same conclusion by observing an abnormal number of transactions during the publication of the 20-F forms. In the British market, Skaife and Olssen (2002) found similarities in the levels of value relevance for accounting figures compared according to US GAAP and IFRS. Furthermore, in the German market, Leuz (2003), Bartov, Goldberg and Kim (2005), and Meulen *et al.* (2007) studied a sample of companies listed on the new German stock market. The study showed a lack of any significant difference between the value relevance of US GAAP and IAS/IFRS.

As with the previous research, our study is interested in estimated the value relevance of the US GAAP and the IFRS on financial service companies (banks and financial establishments). Nevertheless, contrary to previous studies which made their comparisons on only one financial market, we will base our study on several different institutional models, specifically the American market for US GAAP, and the markets of the Benelux countries, the French market, the Spanish market and the British market. Conscious of the potential bias in relation to the characteristics of each of these markets (Barth and Clinch, 1996), our goal will be to compare the value relevance of accounting figures by the association between these and the market returns. Our research question is centered on the identification of the reference (IFRS or US GAAP) and the financial market (European or American) on which the impact of the accounting figures on the market return is the most significant.

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The sample studied is made up of smaller sample groups of all banks listed on five different financial markets, specifically the markets of the Benelux countries (Brussels, Amsterdam and Luxemburg) with 45 companies, the Spanish market with 21 companies, the French market with 57 companies, the British market with 184 and the American market with 121 companies.

I. Literature review

THE BASIS OF ASSOCIATION STUDIES

Financial accounting may generally be recognised as having two functions. The first function is based on the agency theory and is concerned with controlling the links between the company and its partners. In this context, the accounting is a basis of calculation which takes into account and provides proof. Whilst the second function, corresponds to the provision of information allowing investors to appreciate the company's value (Dumontier and Martinez, 2001). In other words, by using the various financial and accounting indicators, the investors can value the company's shares, which allow them to make decisions, notably whether to buy/sell shares on the markets.

There are many criticisms of this latter function such as: being based on unreal principles, the information is too late and becomes obsolete, it is a complex system allowing many subjective choices by managers…One may really doubt then if the explanatory power of accounting indicators could really help the investors to have an idea or estimate the value of the company. In order to answer these doubts and criticisms, many research papers called "Value Relevance Studies" have been carried out.

THE ORIGIN AND PURPOSE OF THE VALUE RELEVANCE STUDIES

Although the term "Value Relevance" only really appeared in the literature in the 1990s, studies carried out to show the relation between the accounting figures and company value began more than 41 years ago. The first article in this area was published by Miller and Modigliani (1966), using a sample of companies belonging to the electricity sector. Both authors showed that the capitalisation of earnings on the assets balance sheet is of significant importance in the market valuation. However, it was to Ball and Brown (1968) and Beaver (1968) who earned the right to be considered as the founders of the Value Relevance studies on accounting numbers. Ball and Brown (*op. cit*) studied the relevance content of earnings, and showed that these are correlated with market prices. As for Beaver (*op. cit*), he studied the value relevance by observing the market price reaction and the transaction volume following the publication of annual reports. Nevertheless, it is considered that the first study which literally used the term "value reference" to describe the relation between accounting figures and company value is that of Amir *et al.* (1993), Holthausen and Watts (2001) classified these studies into three categories.

The first category is the relative association studies where the researcher, using the linear regression technique, compares the degree of correlation 'R^2' of the different accounting and financial indicators with the market price over a relatively long period. The accounting indicators which are expressed by a capital "R^2" are considered as the most relevant. These studies may concern notably valuing the degree of correlation between an accounting profit calculated according to two different standards (local standard vs foreign standards) and the market profitability (Harris *et al.*, 1994, Dhaliwal *et al.*, 1999, Niskanen *et al.*, 2000).

The second category based on an incremental association studies are interesting in determining to what extent added a given variable to a model comprising other explicit variables has an impact on the market price or the market profitability. In this case, it is considered that the variable test is relevant when its "R^2" is significantly different from zero. (Barth, 1994, Venkatachalam, 1996, Eccher, Ramesh and Thiagarajan, 1996). Theil, (1971), explain that the incremental explanatory power of the new variable is measured by the difference between the coefficients of determination (R^2), these coefficients often carry in literature review's the nomination of semi-partial coefficient of determination. (Cohen and Cohen, 1975, 79-84). Its objective is to measure the incremental explanatory power of a variable in the presence of the other independent variables.

The last category is concerning studies containing marginal information, in this type of study, the so called "event" methodology is used over a relatively short period (window). The purpose is to determine if the modification of certain accounting numbers due to the disclosure of new information is correlated with a change in the market price or in the returns. In the event of a market reaction, the new information is considered as being relevant. (Ball and Brown, 1968; Beaver, 1968; Dumontier and Raffournier, 2002; Gajewski and Quéré, 2001).

THE DUALITY OF IFRS – US-GAAP IN RESEARCH LITERATURE

The IAS/IFRS standards are based on generous principles, whereas the US-GAAP are based on very detailed and complex rules. Indeed, while the IFRS standard currently cover more than 2000 pages of accounting rules, the American US-GAAP standards include nearly 2000 distinct declarations (standards, interpretations, opinions and bulletins), many of which span several hundred pages, published in different forms and formats by many different bodies. (Gill M. L., 2007). Nevertheless, because of the convergence work set up by the two standardisation authorities, the scale of the divergences between the standards is continuously diminishing. As an example, the recent declaration No 159 of the FASB "The Fair Value Option for Financial Assets and Financial Liabilities" proposes an option for Fair Value similar to that in the IAS 39 standard, albeit with several divergent points. Little research has been carried out in the banking sector. Hernandez (*op. cit*), used Gray's conservative index to analyse the growth in the adoption of the US GAAP by banks

in five Latin American countries, in this case, Argentina, Chile, Columbia, Brazil and Peru. They noticed a growing trend in the number of Latin American banks complying with the US GAAP, which could lead to the conclusion that the use of US GAAP increases the value relevance of accounting figures. The results of the Khurana and Kim study (2003) carried on a sample of 320 American banks during the period 1995-1998, showed that applying the historical cost gives more relevance to the fair value for average sized banks that do not belong to a group with international visibility.

Leuz (2003) examined the difference between the American accounting standards (US-GAAP) and the international standards (IFRS) in terms of asymmetric informations. For that, the author selected a sample made up of between 69 and 195 companies listed on the new German stock market "Germany's New Market" for the years 1999 and 2000. The results indicated that the US GAAP and the IFRS have a comparable effect in terms of reducing asymmetric informations, and that despite the apparent differences between these two standards, the companies were similar in terms of the quality of the accounting numbers. For Leuz, this result can be explained by the fact that the companies studied belonged to the same financial market. These companies are thus subject to the same institutional conditions. Meulen *et al.* (2007) established a sample made up of 128 companies listed on the new German market, while most (116) were German companies, the sample included companies from six different countries. The value relevance was measured by the various indicators used in research of this type. The results found a relative similarity in the value relevance of the financial data prepared according to the IFRS and the US GAAP rules. Nevertheless, the US GAAP showed a certain superiority in the predictive capacity of the accounting information.

Harris and Muller (1999) studied during the period [1992-1996] the market valuation of companies from a sample made up of 31 non-American companies from 13 different countries. Each company applied both the international accounting standards (IFRS) on the local market, and the US GAAP by providing a 20-F form for their listing on the American stock market. The authors wanted to find out if the reconciliation with the American GAAP provided more information than IFRS. The results suggested that share price has a greater correlation with financial numbers in IFRS than with those using US GAAP. Using a sample made up of 38 non-American companies listed on the American stock markets and for a period between 1995 and 2001, Chen and Sami (2006) analysed the reaction of the financial markets in terms of transaction volume following the publications of the 20F reconciliation forms. The results confirmed a positive correlation between the accounting book value determined using US GAAP and the transaction volumes in the short term. These results showed that the American investors take into consideration the value content of the IFRS/ US GAAP when making investment decisions.

The Bartov, Goldberg and Kim study (2005), set up using a sample group of 699 German companies, had the aim to compare the value relevance of three accounting standards, specifically the US GAAP, the IFRS and the German standards. The empirical tests were carried out using a regression model of returns/earnings/ The authors showed that earnings based on the American standards and international standards provided an explanatory power higher than that found with the German standards.

Beckman, Brandes and Eierle (2007) examined 22 German firms that adopted either IFRS or US GAAP between the years 1998 to 2002. The data set comprised 10 IFRS and 49 US GAAP firm-year observations. The results indicate that the transaction from local German standards to IFRS or US GAAP in net income and shareholders' equity was not value relevant, but equity adjustments relating to provisions, impairment write-downs and employee benefits provide incremental information. The authors explain this last finding by the existence of differences in the German accounting that were not acceptable under IFRS, such as the immediate writing-off of assets, overestimating provisions and creating hidden reserves.

Jermakowicz, Prather-Kinsey, and Wulf, (2007) found results opposed to those of Beckman *et al.* (*op. cit*). Indeed, the examination of 30 German companies that adopted IFRS or US GAAP during 1995-2004, shown that the value relevance of earnings increased. Indeed, the examination of 30 adoptive German companies of the IFRS or the US GAAP for the period 1995-2004, highlights an increase in the explanatory capacity of the benefit. The authors explain that this result confirms the assumption which stipulates that the IFRS are more useful for the investors compared with the former German standards based on the tax system, conservatism, and have a broader stakeholder orientation. Schiebel (2007) arrives at opposite results on a sample for a sample of 24 German companies that adopted IFRS over the period 2000-2004.

More recent cross-country value relevance studies have been performed by Cahan et *al.* (2009). The authors test whether some measures for accounting quality (earnings persistence, relationship between earnings and future cash flows) have an impact on value relevance. Remarkably, the authors not only control for investor protection but also for what they call the "opaqueness of a country's information environment" (measured as analyst coverage and a timeliness of financial information score). Finding that the relationship between earnings quality and value relevance of earnings is stronger in countries with higher levels of investor protection and a less opaque in-formation environment, the study points to the existence of international differences in the ability of stock prices to capture useful accounting information, but provides no explanation for such differences.

■ II. Assumption development and sample description

ASSUMPTIONS

As previously mentioned, our study aimed to find out under which combination (US GAAP, American Market) or

(IFRS, European Market), the relation between accounting numbers and the market price is the most significant.

Assumption development for this type of study is generally based on the culture of the country in which the stock market is based (Arce and Mora, 2002). Nobes (1984), and Nobes and Parker (2002) provide evidence of certain elements considered as explanatory the agreed differences in systems and accounting practices in countries, notably: (1) the common law legal system as practised in Anglo-Saxon countries or written law (code law) as practised in Continental European countries; (2) the nature of the investors and the fund source : private, banks or markets; (3) the financial system and whether or not it is based on accounting numbers to calculate the tax base; (4) the opinion of professionals, standardisation bodies, and lawyers who influence and dominate accounting development; (5) the inflation rate, and finally (6) the events and historical accidents which marked the previous economic situation.

La Porta *et al.* (1998) analyze a sample of 49 countries and note that investor interests are better protected in the Anglo-Saxon customary law than in civil law country like France. They also note that the degree of investor protection in Germany takes a middle position between the Anglo-Saxon and Continental. The authors explain that this difference in protection of investors is due to wide freedom of judges in Anglo-Saxon interpretation of certain principles and their ability to trait a case by case special events.

The application of cultural items in the value relevance studies has been treated by several authors. Joos (1997) suggests that the conservative culture plays an important role in determining the parameters (or coefficients) of the theoretical model of Feltham and Ohlson (1995). He supposes that in countries where the accounting is based on a conservative culture (continental system), the correlation coefficients between earnings and book value on one hand, and the share price on the other hand, are higher compared to those calculated in the Anglo-American system. He also supposes that the value relevance of earnings is higher than that of book value in the UK (because of the importance of common shareholders) and vice versa in both Germany and France. The idea of accounting conservatism used by Joos (1997) to make his prediction is based on the concept of conservatism used by Belkaoui (1985: 239). He claimed that the term "accounting conservatism" implied that preferably the lowest values of assets and revenues and the highest values of liabilities and expenses had to be reported. Debtholders and other creditors demand timely information about bad news because the option value of their claims (Smith, 1979) is more sensitive to a decline than to an increase in firm value. For this reason Continental countries, with financial institutions as the main providers of finance, have been traditionally considered more conservative than Anglo-American countries. By using the same assumptions, King and Langli (1999) and Arce and Mora, (2002) found that book value is more relevant that the earnings in continental countries, but less in the Anglo-American countries (UK).

In order to develop our hypotheses, we have considered the same traditional classification of the European countries into two accounting systems: the Continental system (code-law countries) and the Anglo-American system (common-law countries). Though we are aware that this traditional classification of the European accounting systems does not accurately reflect their complexity, we consider, as most researchers do, that the distinction of these two groups is still necessary at least to develop hypotheses. Thus, by taking into account the above, we can formulate our assumptions as follows

A1: In continental markets, the value relevance of book value per share is greater than the value relevance of earnings per share.

A2: In the Anglo-American markets, the value relevance of earnings per share is greater than the value relevance of book value per share.

Furthermore, the introduction of IFRS within the European Union in 2005 had undoubtedly a considerable impact on the financial communication and modified the direction and the significance of several countable indicators for the investors. According to the countries and existing local countable standards' before the passage to the IFRS, the impact of these last on financial information is not perceived psychologically in a similar way by all economic agents[2]. In addition, the conceptual framework of the IASB stipulates that these new standards are supposed to ensure more value relevance by the production of useful information for the shareholders, which implies a greater explanatory power of accounting numbers.

With regard to our study, we propose to distinguish between the two institutional accounting systems as

Table 1: Fundamental characteristics of Anglo-Saxon and continental accounting systems

Accounting system	Continental	Anglo-saxons
Source of financing	Banking sector	Financial market
Culture	Collective aspect	Individual aspect
Legal system	Written law, the law provides precise accounting laws	Jurisprudence, the law is developed by bodies
Tax system	Close link between tax issues and accounting	Accounting is unconnected to tax issues

Source : based on Glaum et Mandler (1996, op.cit.)

per the classification proposed by Glaum and Mandler (1996). Here the both authors distinguished between the Anglo-Saxon system and the continental system. Each system answers to the economic and social characteristics presented below (see Table 1).

However, the financial circles of continental European countries are moving in recent years from a banking system to a more liberal as Anglo-Saxon system. The accounting rules of continental countries to be similar to those of Anglo-Saxon countries. This leads us to develop the hypothesis on the approximation of European financial markets in terms of informational relevance.

A3: There is no significant difference between common value relevance of earnings and book value per share on continental markets and Anglo-American markets.

SAMPLE CHARACTERISTICS

We have chosen the financial sector in this study because of the specificities and particularities of this sector. In fact, finance and insurance companies' book values of equity are fundamentally different from those of nonfinancial companies. They are also exposed to a multitude of financial risks (e.g., interest rate risk, foreign exchange risk, credit risk, liquidity risk) due to the nature of their operations. Another reason of our choice is the concept of fair value that has not been unanimously approved by the financial community. The opponents highly dispute the postulate of the "fair value" which is essential in many standards belonging to the reference frame of the IASB and more particularly within the framework of the accounting treatment of the financial instruments. The financial institutions expose the inadequacy of the mechanisms provided by IAS 32 "financial Instruments: information required", IAS 39 "financial Instruments: accounting and evaluation" and IFRS 7 "information on the risks" for the coverage of the risk of rate associated with the activity of intermediation of the commercial bank.

Our initial sample is made up of sub-groups comprising all financial companies listed on the five different financial markets that are the markets of the Benelux countries (Brussels, Amsterdam and Luxemburg) with 45 companies, the Spanish market with 21 companies, the French market with 57 companies, the British market with 184 companies and the American market with 121 companies, for the period 2005, 2006, 2007 and 2008.

In order to avoid any analytical problem and to ensure a certain homogeneity in our sample, we retained certain selection criteria, notably:

(1) The sample of companies selected in the financial sector was based on the Global Industry Classification Standard[3]. Thus, we only kept companies with the code 40 "Financials".

(2) Companies with a negative equity value were removed from the sample. These are likely to be in financial difficulty which will give them a specific character which could harm our analysis[4].

(3) Finally, the companies with extreme values for BVS (equity) and EPS (earnings/accounting book value) were removed from the sample. The corresponding observations are those witch the value are higher / lower than ±3,29 the standard deviation from the mean of the sample, which statistically corresponds to 1 on 1000 observations.

Table (2) shows the breakdown of companies by industry as defined by the GICS classification.

STATISTICAL DESCRIPTION

As previously mentioned, our study explores two generic accounting variables: book value and earnings. We focus on both accounting variables for two reasons. First, a central feature of the accounting systems in the world is that the financial statements of companies are comprised of at least two components, namely a balance sheet and an income statement. Second, book value and earnings are the key variables in the theoretical accounting valuation model developed by Ohlson (1995).

The accounting and financial data for the entire period of the study come from the Thomson Financial database. The statistical description of the entire sample, by year and financial market are presented in Table 3. This data shows a positive skew (mean > median) for all the variables (Price, EPS and BVS) no matter what period studied. Our results show that the value of book value per share is considerably higher than that of earnings per share for the entire period studied.

Table 2: Composition of final sample by GICS sector

Global Industry Classification Standard		Benelux	Spain	France	G. Britain	USA
401010	Commercial Banks	16	53	95	32	132
401020	Thrifts & Mortgage Finance	-		8	4	64
402010	Diversified Financial Services	65	9	24	66	49
402020	Consumer Finance	-	-	-	30	37
402030	Capital Markets	60	10	63	374	139
403010	Insurance	4		-	-	-
404020	Real Estate Investment Trusts	-	-	4	-	-
404030	Real Estate Management & Development	-	-	4	10	-
Total		145	72	198	516	421

Table 3: Descriptive statistics

Years	Indicators	Benelux			Spain			France			United Kingdom			United States		
		Price	EPS	BVS	Price	EPS	BVS	Price	EPS	BVS	Price	EPS	BVS	Price	EPS	BVS
2005	N	35	35	35	17	17	17	49	49	49	101	101	101	100	100	100
	Mean	148.61	40.70	448.59	17.86	1.40	9.01	160.67	9.71	171.13	250.81	1.13	10.91	46.83	21.85	118.16
	Median	22.56	2.36	16.20	12.29	0.82	5.05	64.00	5.95	45.22	123.75	0.03	0.65	33.94	2.11	14.32
	Std. dev.	551.75	155.62	2,267.58	18.16	2.09	11.34	326.13	13.01	402.40	344.98	6.93	59.04	52.22	184.87	975.70
	5th Percentile	0.99	−0.57	0.83	2.03	0.05	0.46	2.65	−0.01	0.71	3.89	−0.18	0.01	12.36	0.32	3.14
	95th Percentile	1,170.00	359.73	3473.90	79.65	6.77	40.51	1,278.00	44.84	1,604.04	950.00	1.01	19.47	127.31	7.49	51.17
2006	N	35	35	35	18	18	18	49	49	49	126	126	126	101	101	101
	Mean	170.22	27.72	471.58	23.30	2.07	10.15	256.15	19.08	238.36	262.08	1.13	7.91	52.13	13.00	125.75
	Median	24.30	2.37	14.24	17.36	1.06	6.00	72.70	7.58	53.99	134.54	0.04	0.63	38.13	2.22	15.57
	Std. dev.	615.99	106.86	2,341.01	21.02	3.43	12.26	601.94	38.67	628.51	364.77	7.81	43.98	47.17	94.54	1,026.66
	5th Percentile	1.48	−2.05	1.01	2.16	0.06	0.51	3.94	−0.02	1.19	2.26	−0.11	0.01	11.69	0.22	3.45
	95th Percentile	1,416.00	281.44	3,711.61	92.15	14.15	45.14	2,087.75	144.00	2,290.37	1,098.40	1.17	8.89	157.75	9.34	69.92
2007	N	38	38	38	20	20	20	51	51	51	145	145	145	111	111	111
	Mean	150.06	23.62	501.52	18.42	2.00	11.27	236.37	20.97	217.92	233.06	1.58	7.68	37.66	−13.47	85.89
	Median	20.88	2.32	15.43	13.47	1.10	6.35	67.49	5.15	53.24	112.50	0.04	0.59	26.32	1.42	15.96
	Std. dev.	518.64	114.39	2,602.69	15.78	2.39	13.46	564.40	48.86	540.77	355.04	12.91	51.82	37.10	151.78	667.89
	5th Percentile	0.65	−1.18	0.58	2.38	0.08	0.75	4.54	0.12	2.14	2.16	−0.17	0.02	7.49	−7.75	2.19
	95th Percentile	1,010.95	80.92	1,959.28	63.51	8.47	50.68	1,900.80	167.68	2,072.36	990.15	1.12	11.36	111.77	6.56	70.89
2008	N	37	37	37	17	17	17	49	49	49	144	144	144	109	109	109
	Mean	98.06	16.04	556.15	9.45	1.60	13.79	164.27	−3.73	167.38	123.75	0.62	5.96	19.97	−1.06	20.11
	Median	9.50	−0.10	13.23	5.94	0.63	5.60	25.30	2.09	53.61	54.00	0.02	0.66	14.08	0.45	13.30
	Std. dev.	403.00	200.42	3,077.25	8.59	2.78	19.22	427.25	40.18	375.82	213.07	6.82	48.71	20.26	5.15	20.50
	5th Percentile	0.41	−64.93	0.73	1.69	−2.96	1.19	2.31	−67.75	3.09	1.53	−0.61	0.02	1.67	−11.23	2.34
	95th Percentile	569.00	125.78	2535.11	32.87	8.02	61.28	1,424.00	20.01	1,541.77	564.92	0.79	7.78	60.60	4.39	63.48
Total	N	145	145	145	72	72	72	198	198	198	516	516	516	421	421	421
	Mean	141.31	26.80	495.46	17.39	1.78	11.05	204.69	11.60	198.89	213.11	1.11	7.89	38.73	4.48	86.09
	Median	19.47	1.65	14.65	12.20	0.85	5.73	47.76	4.41	52.45	94.72	0.03	0.64	27.13	1.53	15.03
	Std. dev.	521.44	147.98	2,572.46	16.96	2.68	14.14	491.26	38.74	495.24	326.29	9.15	50.58	42.30	128.09	770.74
	5th Percentile	0.89	−6.44	0.97	2.21	0.06	0.69	3.44	−2.34	1.77	2.00	−0.23	0.02	4.25	−5.70	2.81
	95th Percentile	566.90	119.37	907.01	59.30	8.10	47.19	1,367.35	59.72	1,589.66	906.50	0.95	8.24	109.91	7.00	62.54

MODELLING OF THE RELATION BETWEEN EPS, BVS AND PRICE

The methodology adopted in this research is that of association studies. This method, assuming the efficiency of the financial markets, tries to measure the value relevance of accounting numbers by measuring the association between the company's market value and the various financial indicators. Ohlson (1995) stipulated that the company market value is a linear function of its earnings and its net situation. Prior studies (Barth, Beaver, and Landsman, 1993; Collins, Madew and Weiss 1997, Barth, Beaver, and Landsman, 1998; Collins, Morton, and Xie, 1999) have shown empirically that both earnings and book value explain share price.

Thus, we will develop our model, to study the value relevance of BVS and EPS as follows:

$$P_{it} = b_0 + b_1 BVS_{it} + b_2 EPS_{it} + e_{it} \quad (1)$$

Where:

P_{it} : Share price of company i at the end of year t ;
EPS_{it} : Earnings per share of company i during period t ;
BVS_{it} : Book value per share for company i during period t ;
e_{it} : Other value relevances for company i during period t ;

The equation (1) expresses the price per share as a function of their accounting values and the relative earnings. Examining the incremental value relevance of these two last variables requires the examination of two additional equations. The first (equation 2) presents the price only as a function of the accounting value of the share BVS, while the second (equation 3) interprets the price as a function of the earnings per share.

$$P_{it}=c_0+ c_1 BVS_{it}+e_{it} \quad (2)$$

$$P_{it}=d_0+ d_1 EPS_{it}+e_{it} \quad (3)$$

The correlation between the accounting variables and the market returns is measured by a regression coefficient (R^2). This coefficient explains the intensity of the relation between the market price and the accounting variables selected. It informs on the value content of the accounting indicators and expresses their capacity to reflect the data transmitted on the financial market which is incorporated in the company's market price. The higher R^2, the greater the redundant value content of the accounting variables. The regression coefficients (b_0, b_1, b_2, c_1 and d_1) illustrate the correlations which are expressed in the accounting variables and the price. More specifically, they measure the impact of the relative variation of price which results from a change in the accounting indicators.

■ III. Regression results

THE EXPLANATORY POWER OF EPS AND BVS

Table 4 summarises the various results applied using the equations (1), (2) and (3). Applying the first equation to each of the financial markets for the entire period, shows that the Benelux market is the most pertinent in terms of the quality of earnings and equity per share with a highly significant R^2=89.99% ($\alpha < 0.05$), followed by the French R^2=85.98%, Spain R^2=55.77%, United States R^2=48,50%, and the Great Britain with R^2=39.22%. The results from the second model concerning the value relevance of book value per share leads to the same conclusions as those expressed by the previous model. The determination coefficient (R^2) for the BVS on the Benelux market is estimated at 90.03%, very significant ($\alpha < 0,05$), whilst the (R^2) observed in the American market is the weakest at 29.56%. The analysis of the results of the 3rd model indicates that the earnings per share have the greatest relevance in the Benelux market with (R^2) equaling 76.85% and the American market where (R^2) = 33.19%.

However, to assess whether a difference in the R^2 is statistically significant, we need to control for between-sample differences. To that end, we use the same test statistic as Lang, Raedy, and Wilson (2006) and Barth, Landsman, and Lang (2005), based on the estimation of R^2 standard deviations by applying Cramer's (1987) procedure. The z-statistic was estimated as $Z = \left(E(R_1^2) - E(R_2^2)\right) \Big/ \sqrt{\sigma^2_{R_1^2} + \sigma^2_{R_2^2}}$ where $E(R_i^2)$ and $\sigma^2_{R_i^2}$ represents the expected value and variance of R_i^2 for sample i. Under the null hypothesis of no significant difference between the R^2, Z-statistic is approximately standard normal in large samples.

Table 5 shows the results of evaluating the difference between the R^2s by Cramer's (1987) method. As reported, there are significant differences in the explanatory power of the earnings and equity per share between Benelux (R^2 = 89,99%) and Great Britain (R^2 = 39,22%) at the 5% level (Z = 1,849), Benelux (R^2 = 89,99 %) and United States (R^2 = 48,50%) at the 10% level (Z = 1,298), and between France (R^2 = 85,98%) and Great Britain (R^2 = 39,22%) at the 10 % level (Z = 1,454). However, the differences of the explanatory power between the rests of the countries are not statistically significant at conventional levels (p-value >10%). Thus, it appears that the explanatory power of earnings and equity per share is, in the most cases, not significantly different between continental markets and Anglo-American markets. This finding is partially consistent of our third hypothesis.

Furthermore Table 6 below and Graph 1 show the existence for the entire European sample group – except Spain – of a high level of value relevance for book value per share compared with the value relevance of earnings per share at the 0.01 level. This superiority is very significant for France for which the ratio between the determination coefficients is estimated at 266.15%,

Table 4: Results of the regression concerning the explanatory power of the accounting value and the earnings per share

Period	N	Model 1: Pit=bo+b1(EPSit) +b2(BVSit) +eit				Model 2: Pit=co+ c1(BVSit) +eit			Model 3: Pit=do+ d1(EPSit) +eit		
		bo	b1(EPS)	b2(BVS)	R2(e,b) *Adj.*	co	c1(bvs)	R2(b) *Adj.*	bo	d1(eps)	R2(e) *Adj.*
Panel A : Benelux countries											
2005	35	26.87 (2.47)**	1.26 (4.40)***	0.16 (7.96)***	98.80%	40.46 (3.11)***	0.24 (42.19)***	98.12%	6.78 (0.38)	3.49 (30.73)***	96.52%
2006	35	21.87 (3.96)***	3.81 (18.04)***	0.09 (9.37)***	99.75%	47.79 (2.72)***	0.26 (34.80)**	97.27%	11.14 (1.08)	5.74 (60.68)***	99.08%
2007	38	61.46 (2.92)***	−5.53 (−1.08)	0.44 (1.94)**	94.87%	52.66 (2.71)***	0.19 (26.10)**	94.84%	45.88 (2.27)**	4.41 (25.17)***	94.47%
2008	37	17.60 (3.19)***	−0.49 (−7.57)***	0.16 (37.82)***	99.35%	25.83 (2.96)***	0.13 (45.89)***	98.32%	70.36 (2.04)**	1.73 (9.92)***	73.01%
Total period	145	46.03 (3.30)***	−0.18 (−0.71)	0.20 (13.74)***	89.99%	45.98 (3.30)***	0.19 (36.07)***	90.03%	58.44 (2.76)***	3.09 (21.89)***	76.85%
Panel B : Spain											
2005	17	4.20 (2.10)**	−0.04 (−0.02)	1.52 (3.47)***	88.19%	4.21 (2.23)**	1.52 (11.41)***	88.97%	6.96 (2.87)**	7.79 (7.94)***	79.51%
2006	18	6.20 (2.99)***	−1.53 (−1.62)	2.00 (7.56)***	90.21%	6.81 (3.19)***	1.63 (11.91)***	89.22%	13.59 (3.51)***	4.69 (4.75)***	55.92%
2007	20	6.91 (3.17)***	10.70 (2.86)**	−0.88 (−1.33)	78.12%	7.29 (2.83)**	0.99 (6.64)***	69.37%	6.73 (3.03)***	5.84 (8.08)***	77.20%
2008	17	5.70 (2.69)**	0.90 (0.69)	0.17 (0.89)	33.68%	5.56 (2.68)**	0.28 (3.16)***	36.01%	6.39 (3.26)***	1.92 (3.08)***	34.63%
Total period	72	8.29 (4.90)***	3.73 (3.67)***	0.22 (1.16)	55.77%	8.15 (4.44)***	0.84 (8.14)***	47.88%	8.93 (5.56)***	4.75 (9.47)***	55.55%
Panel C : France											
2005	49	−27.28 (−2.26)**	9.55 (9.66)***	0.56 (17.42)***	95.73%	30.85 (1.71)*	0.76 (18.23)***	87.35%	−41.38 (−1.26)	20.81 (10.21)***	68.27%
2006	49	12.05 (0.39)	4.84 (3.18)***	0.64 (6.80)***	89.93%	41.72 (1.31)	0.90 (18.77)***	87.98%	−10.59 (−0.25)	13.98 (14.00)***	80.25%
2007	51	13.14 (0.44)	4.31 (2.82)***	0.61 (4.42)***	88.06%	24.67 (0.78)	0.97 (17.83)***	86.37%	14.51 (0.42)	10.58 (15.97)***	83.55%
2008	49	−35.82 (−1.23)	3.65 (3.99)***	1.28 (13.06)***	82.42%	−3.06 (−0.09)	1.00 (12.66)***	76.84%	146.26 (2.65)**	−4.83 (−3.50)***	18.96%
Total period	198	17.23 (1.22)	1.57 (3.96)***	0.85 (27.51)***	85.98%	22.79 (1.56)	0.91 (33.33)***	84.93%	121.11 (4.03)***	7.20 (9.66)***	31.91%
Panel D : Great Britain											

Table 4: Results of the regression concerning the explanatory power of the accounting value and the earnings per share (suite)

Period	N	Model 1: Pit=bo+b1(EPSit) +b2(BVSit) +eit				Model 2: Pit=co+ c1(BVSit) +eit			Model 3: Pit=do+ d1(EPSit) +eit		
		bo	b1(EPS)	b2(BVS)	R2(e,b) *Adj.*	co	c1(bvs)	R2(b) *Adj.*	bo	d1(eps)	R2(e) *Adj.*
2005	101	201.43 (7.77)***	5.86 (0.72)	3.09 (3.25)***	42.09%	201.33 (7.78)***	3.70 (8.59)***	42.37%	208.83 (7.72)***	29.30 (7.60)***	36.44%
2006	126	195.29 (8.58)***	14.56 (1.96)**	2.03 (1.53)	39.49%	192.86 (8.38)***	4.42 (8.68)***	38.06%	199.40 (8.77)***	25.12 (8.82)***	38.81%
2007	145	187.21 (9.29)***	46.22 (3.14)***	−7.85 (− 2.14)**	42.00%	174.07 (8.56)***	3.60 (9.38)***	38.30%	177.68 (8.93)***	14.87 (9.81)***	40.50%
2008	144	81.19 (8.32)***	−6.50 (−0.60)	3.33 (2.20)**	53.87%	82.60 (8.74)***	2.43 (12.79)***	54.08%	86.62 (9.05)***	17.10 (12.41)***	52.58%
Total period	516	160.61 (15.80)***	6.32 (2.30)**	2.45 (4.92)***	39.22%	159.38 (15.64)***	3.50 (17.81)***	38.70%	166.04 (16.07)***	18.78 (16.96)***	36.40%
Panel E : United States											
2005	100	13.36 (5.52)***	8.40 (6.21)***	0.21 (1.10)	59.84%	16.31 (5.77)***	1.16 (8.36)***	43.08%	14.26 (6.24)***	9.58 (11.66)***	59.75%
2006	101	19.14 (6.17)***	6.01 (4.20)***	0.31 (1.45)	44.39%	20.72 (6.17)***	1.00 (6.88)***	33.99%	21.05 (7.44)***	7.63 (8.42)***	43.70%
2007	111	15.21 (5.70)***	1.94 (4.72)***	0.68 (5.63)***	37.75%	15.55 (5.29)***	0.76 (5.76)***	24.37%	27.38 (15.29)***	2.27 (4.86)***	18.47%
2008	109	8.64 (5.67)***	1.40 (6.21)***	0.58 (7.76)***	52.01%	6.34 (3.65)***	0.62 (7.09)***	33.46%	18.08 (15.54)***	1.56 (5.45)***	22.68%
Total period	421	14.87 (11.19)***	2.83 (11.88)***	0.69 (10.69)***	48.50%	13.92 (8.97)***	0.92 (12.70)***	29.56%	26.23 (28.82)***	3.58 (13.81)***	33.19%

The stars show a significant result of 1% (***), 5% (**) and 10% (*).

Price = Price of share of company *i* at the end of the year *t*;

EPS = Earnings per share of company *i* at the end of the year *t*;

BVS = Book value per share of company *i* at the end of the year *t*;

Graph 1: Graphical presentation of the value relevance by country

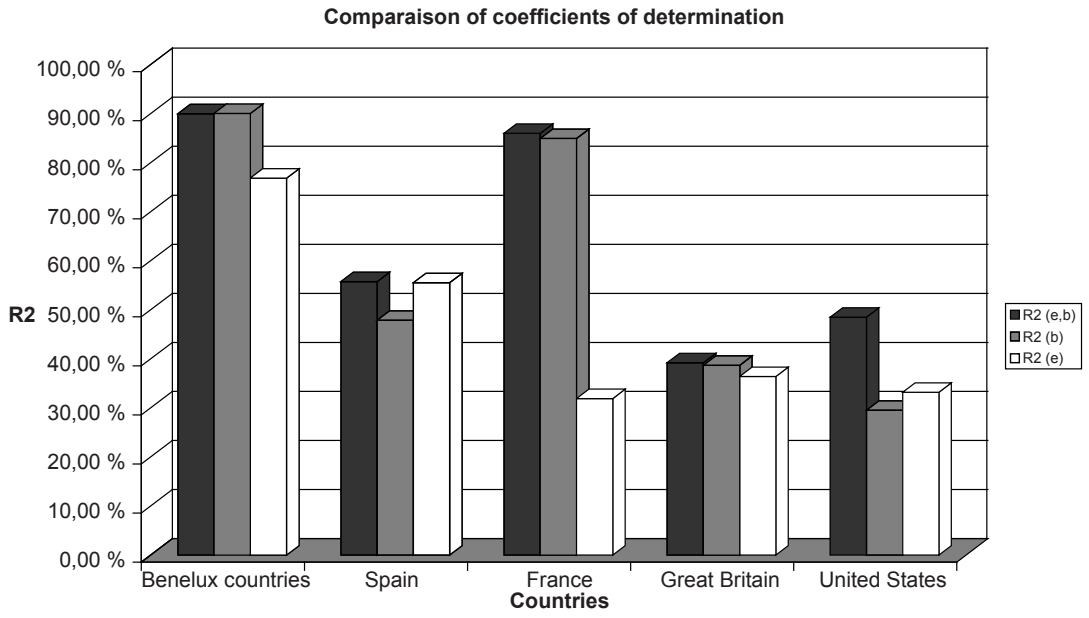


Table 5: Results of Cramer's (1987) test:

		Benelux	Spain	France	Great Britain
Spain	*Cramer Z*	0,686			
	P-value	(0.246)			
France	*Cramer Z*	0,155	−0,574		
	P-value	(0.438)	(0.717)		
Great Britain	*Cramer Z*	1,849	0,310	1,454	
	P-value	**(0.032)**	(0.378)	**(0.073)**	
United States	*Cramer Z*	1,298	0,130	1,038	−0,249
	P-value	**(0.097)**	(0.448)	(0.149)	(0.598)

Note: *Z*-statistic measures the significance of the difference between the coefficients of determination.

Table 6: The ration between the relevance of equity and earnings per share

Country	**R^2 (b)** *Adj.*		**R^2 (e)** *Adj.*	Sig.	**R^2 (b) / R^2 (e)**
Benelux countries	90,03%	>	76,85%	(0,001)	117,15%
Spain	47,88%	<	55,55%	(0,001)	86,19%
France	84,93%	>	31,91%	(0,001)	266,15%
Great Britain	38,70%	>	36,40%	(0,001)	106,32%
United States	29,56%	<	33,19%	(0,001)	89,06%

Notes: The Vuong (1989) test tests for differences in R2 between models (2) and (3) shown in table 4.
Sig. indicates the significance of the difference between the coefficients of determination R2's.

followed by Benelux countries and Great Britain for which the ratio are 117.15% and 106.32%. The contrary results on Spain could be due to the small sample (only 72 observations on all period). In the United States, contrary to European markets, the book value per share has less value relevance than the earnings per share, the ratio is estimated at 89.06%.

The adjusted coefficients of determination R^2, the result of various regressions over all parts of the sample are significantly positive with relatively high values. This comment means that our two variables (EPS and BVS) explain well the price of shares on the various financial markets. Furthermore, the observations made can be summarized as follows: There is no significant difference in the explanatory power of the earnings and equity per share between the continental markets and Anglo-American markets except for Benelux and Great Britain, Benelux and United States, and France and Great Britain.

- The equity per share is more relevant in terms of value than the earnings per share in the European markets in IFRS except for Spain.
- The earnings per share are more relevant in terms of value than the equity per share in the American market using US GAAP and Spain using IFRS.

THE INCREMENTAL EXPLANATORY POWER OF EPS AND BVS

The incremental explanatory power of the book value per share and earnings per share is defined by estimating the adjusted determination coefficients (R^2). This coefficient is generally called the semi-partial determination coefficient in the literature (Cohen and Cohen 1975, 79-84). Its purpose is to measure the incremental explanatory power of a variable in the presence of other independent variables.

Table 7: Decomposition of model (1) and tow-step regression *t*-test

		R^2 (b|e) *Adj.*	*Sig.*	R^2 (e|b) *Adj.*	*Sig.*	R^2 (Com) *Adj.*
Panel A: Benelux countries						
2005	35	2,28%	(0.000)	0,67%	(0.000)	95,85%
2006	35	0,66%	(0.000)	2,48%	(0.000)	96,60%
2007	38	0,39%	(0.061)	0,02%	**(0.289)**	94,45%
2008	37	26,34%	(0.000)	1,04%	(0.000)	71,98%
Total period	145	13,14%	(0.000)	−0,03%	**(0.479)**	76,88%
Panel B: Spain						
2005	17	8,67%	(0.004)	−0,79%	**(0.987)**	80,30%
2006	18	34,30%	(0.000)	0,99%	**(0.126)**	54,92%
2007	20	0,92%	**(0.202)**	8,76%	(0.011)	68,45%
2008	17	−0,95%	**(0.391)**	−2,33%	**(0.503)**	36,96%
Total period	72	0,22%	**(0.250)**	7,89%	(0.000)	47,66%
Panel C: France						
2005	49	27,46%	(0.000)	8,38%	(0.000)	59,89%
2006	49	9,68%	(0.000)	1,96%	(0.003)	78,29%
2007	51	4,51%	(0.000)	1,70%	(0.007)	81,86%
2008	49	63,46%	(0.000)	5,58%	(0.000)	13,38%
Total period	198	54,06%	(0.000)	1,05%	(0.000)	30,86%
Panel D: Great Britain						
2005	101	5,65%	(0.000)	−0,28%	**(0.229)**	36,72%
2006	126	0,68%	**(0.140)**	1,42%	(0.021)	37,39%
2007	145	1,49%	**(0.242)**	3,69%	(0.000)	36,81%
2008	144	1,29%	**(0.203)**	−0,22%	**(0.358)**	52,80%
Total period	516	2,82%	(0.000)	0,52%	(0.077)	35,88%
Panel E : United States						
2005	100	0,10%	**(0.272)**	16,77%	(0.000)	42,98%
2006	101	0,69%	**(0.151)**	10,40%	(0.000)	33,31%
2007	111	19,27%	(0.000)	13,38%	(0.000)	5,09%
2008	109	29,33%	(0.000)	18,56%	(0.000)	4,13%
Total period	421	15,32%	(0.000)	18,95%	(0.000)	14,24%

Notes: Two-step regression is used to test the incremental explanatory power of earning over book value per share and vice versa. *Sig.* indicates p-value of rejecting the null hypothesis of equality of R^2 to Zero.

In defining the determination coefficients R^2 from the equations (1), (2) and (3) as being $R^2_{e,b}$, R^2_e et R^2_b respectively, the incremental explanatory power can be defined as follows (Kings and Langli, 1998):

$$R^2_{e|b} = R^2_{e,b} - R^2_b$$

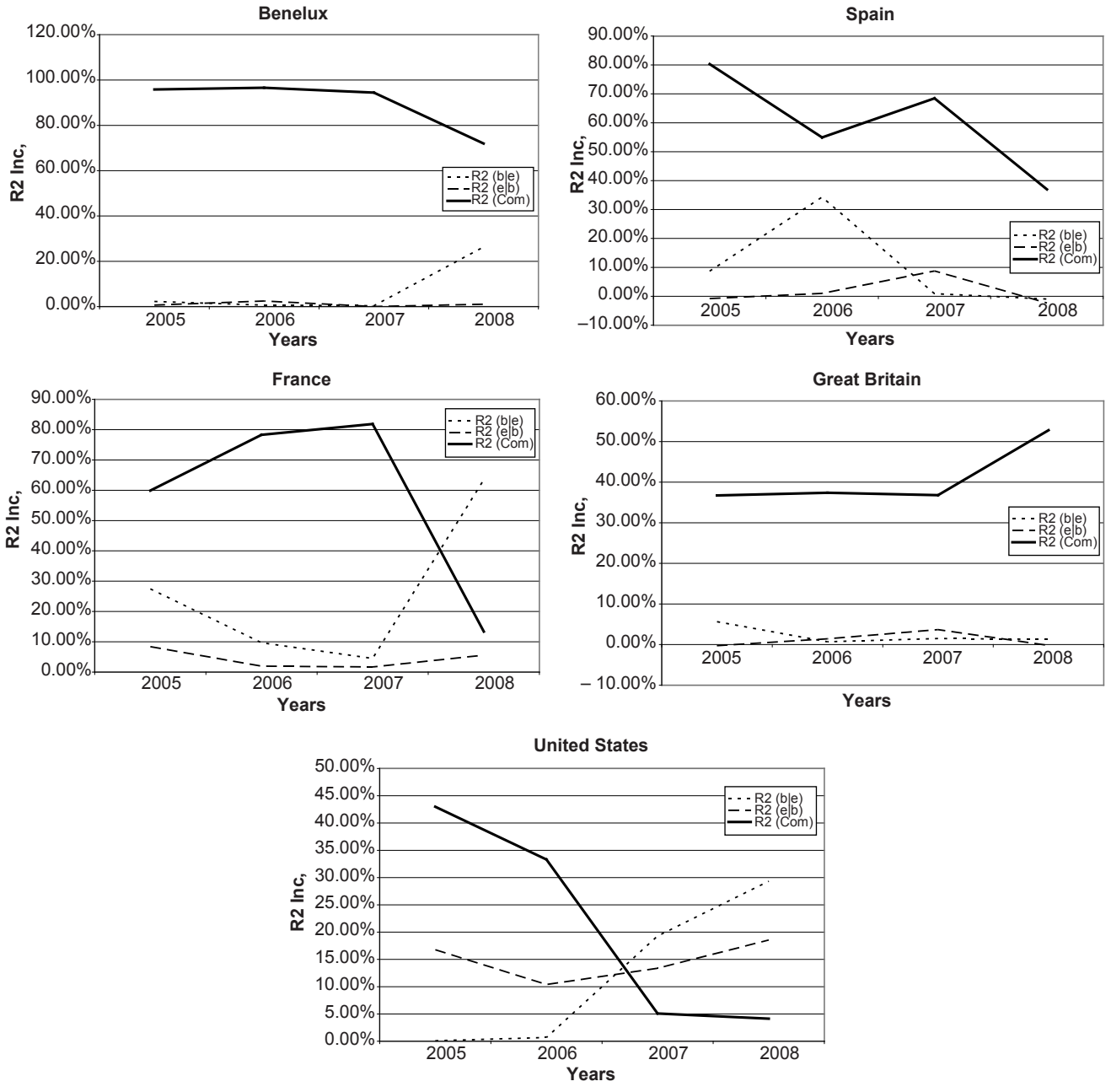
The incremental explanatory power of earnings per share represents the total explanatory power of the book value and the earnings per share less the explanatory power of the book value of the shares

$$R^2_{b|e} = R^2_{e,b} - R^2_e$$

The incremental explanatory power of the book value of the shares represents the total explanatory power of the book value and the earnings per share less the explanatory power of earnings per share

$$R^2_{Com} = R^2_{e,b} - R^2_{e|b} - R^2_{b|e}$$

Graph 2: The incremental power of earnings and equity per share



The common incremental explanatory power at book value and of the earnings per share represents the total explanatory power of the book value and earnings per share less the incremental explanatory power of the book value and earnings per share.

The calculation results of the incremental explanatory power of our two variables are represented in Table 7. The resulting analysis shows that on European markets – except Spain- a much higher incremental explanatory power of BVS than that of EPS. These results are reversed in the American market. However, we observe that R^2 (b|e) on Spain sample and R^2 (e|b) on Benelux countries for a total period are not significant at 5% level. As for the common explanatory power, its overall value greater in the European markets where the common determination coefficients are $R^2(Com)_{Benelux} = 76.88\%$ for Benelux countries, followed by Spain 47.66%, Great Britain 35.88%, France 30.86% and finally United States R^2 $(Com)_{American} = 14.24\%$. Graph 2 shows the growth of value relevance over the three years of the study and for each market place.

Conclusion

This paper presents an international comparison of the value relevance of accounting figures using the accounting aggregates of earnings per share and equity per share. The companies selected belong principally to the banking and financial services sectors. The study was carried out across 5 financial market places including 4 European markets (Benelux countries, France, Spain and Great Britain) subject to the new IFRS international accounting standards. The 5th market place is the United States, subject to the American US GAAP standards. The purpose of the study was to try to answer the following question: under which standard (IFRS or US GAAP, and what financial market (European or American) is the correlation (intensity value) between the accounting numbers (earnings and equity per share) and the market price the most significant?

After various regression tests, the results obtained showed that the earnings and equity had greater value relevance in the European markets with IFRS than in the American market with US GAAP. Indeed, these results show clearly that the Benelux market is the most relevant in terms of value quality of earnings and equity per share. This is followed by the France, Spain, United States and finally Great Britain. However, applying Cramer's test show that the differences in explanatory power between portfolios are not statistically significant except between Benelux and Great Britain, Benelux and United States, and between France and Great Britain.

Another observation as important was discovered and confirmed during the analysis of the value explanatory power of the accounting numbers studied. This revealed that on the European markets, there is a higher level of value explanatory power for book value per share over that of earnings per share. This superiority is not confirmed on Spanish where we think that a sample studied is quite small. In the American market, the results are reversed where the value relevance of earnings is higher than that of book per share.

In conclusion of the present study, it cannot be said that the value relevance of earnings and book value per share differs between European market and USA market. Our others research assumptions were validated except for Spanish sample. Finally, we note that the different proposals of our study concerning the comparison of the European and American financial markets, can be explained both by the different in the accounting standards and the divergence in the national regulatory factors (financial market regulations). Nevertheless, given the ongoing convergence work between IFRS and the US GAAP, we believe that the observed differences in our study will be justified in the future principally by institutional and perhaps cultural factors.

The analysis framework and its empirical validation may be enriched by:

- Taking into consideration other variables and accounting indicators in order to test the explanatory power,
- Analysing the explanatory power of accounting indicators by sector of activity within the banking sector,
- Extending the field of analysis in order to compare other financial markets,
- Studying the evolution of the value relevance for each financial market over the coming years and studying the impacts of the IFRS/ US GAAP convergence project.

1 The E.U ruling no 1606/2002 required all listed companies publishing consolidated accounts to produce financial accounts as of 1st January 2005 in I.A.S. / I.F.R.S.

2 See the Investigation carried out by the Mazars which explains, for example, that 37% against 63% in Europe estimate that the comparisons of the financial statements will facilitate them between countries.

3 The Global Industry Classification Standards (GICS) class companies in 10 economic activity sectors, 24 industry groups, 67 industries et 147 sub-industries. The system is similar to the Industry Classification Benchmark (ICB).

4 See King R. D. et Langli J. C. "Accounting diversity and firm valuation", The international journal of accounting, Vol. 33, N°5, pp.529-567.

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