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## Analysis of the effect of the IFRS application on the valuation of Spanish initial public offerings

### Abstract

The aim of this paper is to analyze the consequences of the application of international financial reporting standards (IFRS) on the valuation of firms going public in the Spanish capital market during the period of 1998-2009. This empirical model is proposed to determine whether the application of the IFRS from January 2005 and onward caused any significant differences in the valuation of firms that had never quoted and, consequently, whether it allows a lowering of the level of initial underpricing by accurately valuing the stocks of the firm. The results show the significant differences in the level of underpricing before and after the application of the IFRS. This level decreased significantly after the implementation of these standards, as did the changes in the market-to-book ratio of securities traded for the first time.

**Keywords:** valuation, initial public offerings, international financial reporting standards, IPO price.

**JEL Classification:** G10, G30, G32.

### Introduction

As a result of progress in the accounting harmonization process, in recent years empirical research has focused to a major extent on the analysis of this process and its effect on the comparability of financial statements (Street et al., 1999; Haller, 2002; and Street et al., 2002). The focus of this body of research has basically proceeded in three different directions.

First, there have been a number of studies addressing the subject of strategies for adopting the international financial reporting standards (IFRS)<sup>1</sup> in diverse countries and their impact on national regulations and practices (Alexander and Schwencke, 2003; Haller and Eierle, 2004; and Vellan, 2004). Second, there is a body of work that examines the progress achieved in the harmonization of international standards with local accounting regulations in each country, many of these studies focus on comparing a country's accounting regulations with international standards<sup>2</sup>. Finally, a third group of research studies analyzes how the adjustments reconciling information drawn up according to local regulations and to reference standards influence accounting figures. The basic aim in this case is to adequately measure the degree of relevance of these differences. The studies by Adams et al. (1999), Leuz and Verrecchia (2000) and Street et al. (2000), among others, follow this line of research.

The IFRS afford a greater approximation to book and market values and hence provide increased information and transparency regarding the value of the firm's shares. In this respect, note should be taken of the lack of research aimed at analyzing the effect that the application of these accounting standards may have on firms that decide

to go public. This dearth of studies is observed both in the Spanish case and at the international level.

The studies on initial public offerings (henceforth, IPOs) have reported a recurrent problem at the international level, due to which firms that begin to quote on the capital market via an IPO offer high returns derived from a discount in the offering price. The financial literature has tried to find an explanation for this phenomenon via a number of papers in different markets which, on the one hand, study the existence of such underpricing, while also attempting to build theoretical models to explain this price reduction. A second anomaly or regularity resulting from the low long-term performance of these companies once they have gone public has likewise been found.

The existing financial literature in this regard is extensive, both at the international level and in the Spanish case. These studies, primarily those by Ritter (1984, 1991), opened the door to a large body of work aimed at analyzing whether these anomalies or regularities typical of IPOs – both on the same day of going public and in the long term – are repeated in different markets. The literature for the Spanish securities market has examined underpricing (Arcas and Ruiz, 1999; Alvarez, 2000, 2001a; Alvarez and Fernandez, 2003; and Farinós et al., 2007b), the medium- and long-term performance of the listed firm (Álvarez, 2001b; Álvarez and González, 2001, 2005a, 2005b; Farinós, 2001; and Farinós et al., 2007a, b), and modifications in operating performance (Álvarez and González, 2005c; and Farinós et al., 2005, 2007 b), as well as the factors that determined the timing of when Spanish firms decided to start trading (Farinós et al., 2005).

In general, attempts to explain the anomaly of underpricing in IPO prices have focused on information asymmetries in the market resulting from the information asymmetry between the firm and investors

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<sup>1</sup> The term IFRS refers to the IAS as well as the IFRS, as well as interpretations of both.

<sup>2</sup> For a review of this body of work, see Larson and Kenny (1999).

with respect to the current value and risk of its future cash flows, as well as from the existence of asymmetric information between informed and uninformed investors.

Within the context of the study of share underpricing, however, there has been little research seeking to analyze the effect that accounting information may have on the appropriate valuation of the securities to be placed on the market. Thus, the aim of the present study is to analyze the consequences that the application of the IFRS may have on the valuation of firms that go public on the Spanish stock market. The goal is therefore to test whether this new treatment of accounting information has a positive effect on the valuation of the security that is to be placed on the market. As the security has been appraised more positively due to higher quality accounting information, this valuation might be expected to have an impact on the anomaly or regularity of the underpricing on the same day of going public.

The interest of this analysis resides in the fact that as these companies have never traded on the stock market, the only information available to new shareholders is the accounting information provided in the prospectus for admission to the stock exchange. It is thus possible to assess the effect that the new legislative framework resulting from the IFRS has on the future valuation of the firm on the capital market.

The database used includes all the firms that went public over the period of 1998-2009. The mechanism used by these firms to go public is the IPO, via the book-building method, which allows greater adjustment of the final IPO price to the actual demand of shares existing on the market. The proposed model aims to determine whether the application of the IFRS from January 2005 onward has caused significant differences in the valuation of firms that had never previously traded and, ultimately, whether it allows the level of initial underpricing to be lowered thanks to more appropriate valuating of the firm's shares. The results show important differences in the level of underpricing before and after the adoption of the IFRS, being significantly lower after they came into effect, as well as changes in the market-to-book ratio of the securities placed on the stock market for the first time.

The remainder of the paper is structured in the following way. Section 1 describes the principal changes introduced by the IFRS and their potential impact on the valuation of the firm's shares. Based on the former, the hypotheses to be tested in the empirical study are set out in Section 2, while the Section 3 details the scope of the research and the data used to examine the effect of the changes re-

sulting from the application of the IFRS in addition to the model to be tested. The results of the estimations carried out are presented in detail in Section 4, while the main conclusions of this research study are summarized in the final section.

## 1. Principal implications of the adoption of the IFRS

Besides seeking a single accounting language based on a common body of regulations with a view to accounting harmonization, one of the goals pursued through the IAS/IFRS, applicable from January 1, 2005 and onward to listed companies presenting consolidated financial statements, is to improve the quality of financial information. In fact, the main objective of the International Accounting Standards Board (IASB), the body that issues the IFRS, is to develop a set of high quality standards to assist capital market participants worldwide, as well as other users, in their financial decision-making. It therefore follows that shareholders and creditors are considered to be the main users/recipients of the information resulting from applying the IAS/IFRS, the importance of such information being prioritized.

In this manner, the objective of financial information as set by the IASB is to allow for the assessment of the possibilities of firms to obtain returns and future cash flows. In short, the trend has an accounting forecasting system that, while not ignoring the classic purpose of controlling and protecting equity, makes assessment of the entity's future prospects and the goal of information, over and above any other consideration.

Ultimately, given the predominant role of the paradigm of usefulness in accounting information, it is essential to know the impact of the application of international accounting standards on the capital market. In fact, one of the most prolific lines of accounting research in the capital market has focused on analyzing the relevance of the value of accounting data with respect to market price in order to justify the process of accounting harmonization. On the other hand, the seminal work by Akerlof (1970) marked the starting point for research on reducing the cost of capital and other favorable economic consequences resulting from better quality accounting information. Some studies, such as those by Bhattacharya et al. (2003), O'Hara and Easley (2004), Hughes et al. (2007), Lambert et al. (2007) and Francis et al. (2005, 2008), show that these effects do occur, including a reduction in the cost of capital.

Within this context, and in order to provide better information on the activity and the value of firms, the IAS/IFRS provide for the use of "fair value" in certain cases. This is often the market value, as "fair value" is a valuation criterion that takes a reliable

market value as reference. Obviously, the IASB introduces the application of fair value – whether in a mandatory or voluntary manner – in those entries in which the market value is readily available and clearly more relevant.

We may thus state that the major impact of the accounting reform subsequent to the adoption of the IAS/IFRS resided in the introduction of fair value as a valuation criterion. The consideration of current values tends to express a true picture of business reality, while providing information that is more meaningful and relevant to the market. Several authors highlight the shortcomings of historical cost: the predictive power of prices with respect to changes in future performance stems from historical cost accounting and has a limited ability to reflect market expectations of future results (Kothari and Zimmerman, 1995). Similarly, Zeff (1999) notes that the use of current values could remedy some of the shortcomings inherent in historical cost accounting in a world of changing relative prices.

Besides the above arguments, as we move inexorably toward a model based on continuous reporting through which corporate financial information will be constantly updated electronically, this trend is consistent with a closer approximation of accounting figures to market values, insofar as it would make little sense to offer continuously updated documents if such values were essentially static like those derived from the historical cost approach.

As a provision for the empirical research of this paper, evidence has confirmed that the information disclosed under the criteria of current values is largely relevant and meaningful for the markets. It has likewise confirmed the existence of correlation between updates of certain entries and stock market prices (or returns). By way of illustration, studies such as those by Sharpe and Walter (1975), Standish and Ung (1982), Easton et al. (1993), Barth (1994), Eccher et al. (1996) and Aboody et al. (1999), among others, find a significant positive correlation between prices and returns with updates, concluding, in some cases, that the market-to-book ratio tends towards unity if updates are included in the book value.

## 2. Hypotheses

Based upon the implications of the IAS/IFRS in the treatment of accounting information set out in the previous section, we put forward three hypotheses to be tested in this research study concerning the valuation of shares to be placed on the stock market.

Given the approach at the regulatory level to use the fair value to value certain assets, in addition to the empirical evidence that corroborates that the infor-

mation disclosed under current value criteria is relevant and meaningful for the markets, we consider it appropriate to formulate the initial underpricing of companies as stated in Hypothesis 1; that is, from January 1, 2005, said underpricing should be lower than that previous to said date, when the principle of historical cost accounting was used to draw up the economic-financial information of firms. On the basis of this reasoning, we propose the first hypothesis of this research:

*H1: The initial underpricing of firms which started trading on the stock market after the implementation of the IFRS is lower than that shown by entities which went public before the implementation of these regulations.*

The underlying basis of this hypothesis is the argument concerning the validity of accounting information with respect to the stock market valuation of shares. If such accounting information is considered to be quality information by its users, the valuation of the securities obtained on the financial market should not differ substantially from that derived from setting a price based on this accounting information. Furthermore, if the quality of the accounting information improves with the change in regulations, the stock market valuation of the securities should be more appropriate after the implementation of the new regulations.

On the other hand, if the book and market values of securities traded on the stock market approach one another, the market-to-book ratio of such shares may be expected to approach unity, or at least decrease significantly as a consequence of the proximity of these two values. Therefore, the market-to-book ratio would present an opposite trend to that proposed above for underpricing. For all these reasons, Hypothesis 2 of this paper may thus be formulated as follows:

*H2: The market-to-book ratio of companies which started trading on the stock market subsequent to the implementation of the IFRS is lower than that of those entities which went public prior to the implementation of these regulations. This ratio is inversely related to the level of underpricing.*

Finally, we intend to test whether the price established in the firm's IPO is in fact related to the quoted value for the securities in keeping with available accounting information, and whether this relationship changes as a result of the implementation of the new regulations. Hypothesis 3 aims to act as a sensitivity analysis. The reasoning here is that if the market value or price of the security is a reflection of the book value of the shares, when new financial information is of a higher quality, this should result in a stronger and more significant rela-



tionship between the two values – book and market – after the implementation of the IFRS. On the other hand, and in relation to the anomaly repeatedly observed for IPOs, a higher book value should be related to a lower level of underpricing of the traded securities. We thus propose Hypothesis 3 as follows:

*H3: The IPO price is directly related to the book value of the shares being placed on the market as a result of the application of the IFRS, this value being inversely related to the level of underpricing.*

The test of these three hypotheses will be carried out on the database using the methodology laid out in the following section.

### 3. Database and methodology

The database used in this study comprises the firms that began trading on the Spanish capital market between 1998 and 2009. Throughout the analyzed study period, most of these firms employed the book-building mechanism to go public, which allows the final IPO price to be better adjusted to the actual market demand for shares. In some cases, these actions consist of public offerings of existing shareholdings, owned by previous shareholders, while in others, they are carried out in conjunction with public offers for subscription (POS), which also allow financing of the firm as a result of the new shares placed on the market. In this regard, the POS is similar to the seasoned equity offering, except that existing shareholders lack preferential subscription rights in IPOs.

For the sake of homogeneity, the database has considered IPOs that took place on the continuous market throughout the study period, excluding the two companies that began trading on the Alternative Investment Market (AIM)<sup>1</sup>. We have likewise excluded privatizations and companies that do not meet the requirement of the issuer being a national entity if they had traded on a foreign market and thus a prior reference price already existed. The analyzed sample comprises 40 companies, 23 of which constituted cases prior to the application of the IFRS and 17 subsequent to this event. In the case of *Dermoes-tética*, its financial statements were fully adapted to the new regulations during the 2005 fiscal year and so it is considered in the post-IFRS group.

As to the number of observations, it should be noted that it consists of the entire available population of companies that went public on the Spanish conti-

nuous market. The chosen period is long in order to make the sample as large as possible. No IPOs were chosen prior to this period because different mechanisms for going public were used previously which might have empirical consequences arising from the process of establishing the initial offering price. As already stated, the issues chosen are IPOs via the book-building method, which makes them homogeneous and therefore comparable in terms of their initial market valuation. Should different methods be mixed together, it would not be possible to properly isolate the effect of the IFRS. By choosing these companies which employed the same mechanism to go public, we ensure that the only change produced is precisely the modification in accounting regulations and, ultimately, that its effects on the valuation of companies that had never previously quoted may be isolated. On the other hand, it would not make sense to analyze the effects on the market-to-book ratio or on the book value of already listed companies, as these companies already have a prior reference price on the stock exchange, which would defeat the object of analysis of this study. When there is already a market price for the shares, accounting changes do not affect the market much, because its first point of reference is the existing price (Álvarez and Fernández, 2003).

In addition to the IPO, three other methods of going public have existed in the Spanish capital market, although they were used to a greater extent in the past, particularly in the period prior to that under study in this paper: direct entry, private placements and, to a lesser extent, mixed placements. Direct entry is a method by which admission is requested to quote shares that are in the hands of the firm's shareholders, provided that the required minimum distribution stipulated by the market is fulfilled. Private placements consist in the offering of a limited number of shares to a specific group of (institutional) investors and are aimed at achieving greater shareholder stability. Private placements are compatible with IPOs and *vice versa*, giving rise to mixed placements, which may succeed in fusing the advantages of both systems through a suitable combination of the two methods. Among public offerings, there are fixed price offerings and others that use the book-building method, i.e., the building of the order book, which is in fact the most widely used mechanism in the majority of countries.

The database was designed with the information contained in the prospectuses for admission to the stock market drawn up by companies in their application to start trading on the market. This information was obtained from the website of the CNMV (Spanish National Securities Market Commission). The economic-financial information is taken from

<sup>1</sup> The companies *Zinkia* and *Imaginarium* went public on the Alternative Investment Market (AIM) and it was decided to remove them from the sample due to not trading on the continuous market. The AIM was promoted by the Spanish Stock Exchanges and Markets (BME) to facilitate the access of small and medium-sized enterprises to the securities markets. It had its first year of effective operation in 2009.

the informative brochure for the offering for the close of the year prior to the firm going public.

The time distribution of the sample shows the existing correlation between the number of companies that started trading on the Spanish stock market and the actual situation of said market. The most striking examples are the year 2006, which was a brilliant year for the stock market, with ten IPOs, two of which were eventually excluded from the analysis for the reasons discussed previously, this being the largest number of IPOs since 2000, and the year 2007, which witnessed eight other IPOs. 2006 was an exception year for the Spanish stock markets in terms of activity and profitability. For the first time in its history, trading volume in shares and stock market capitalization reached the figure of a billion euros, a figure equivalent to the country's GDP. The opposite occurred in 2008, which only saw the IPO of the *Caja de Ahorros del Mediterráneo* (CAM)<sup>1</sup> on the Spanish market. In fact, IPOs in Europe decreased by half in 2008.

According to the data revealed by the European Observatory on IPOs, the first nine months of 2008 saw a sharp drop in both the number and the value of IPOs in Europe. Specifically, 271 IPOs were implemented, 53% less than in the first nine months of the previous year. As a whole, these moved 13,051 million euros, 74% less than in 2007. This represents one of the largest drops since the launch of the Observatory in 2002. This period was characterized by the virtual absence of major operations in Europe. The main operations (by volume) undertaken during 2008 include the issuing of non-voting stock in CAM, the third largest operation carried out in the third quarter. This confirms the strong correlation between the situation of the market and the willingness of companies to go public.

The names of the firms comprising the sample and the distribution of observations for each year are presented in Table 1. The characteristics of the companies and the main parameters of the IPOs are listed in Table 2.

Table 1. IPOs in the Spanish capital market (1998-2009)

Nº	Name of the firm	IPO date
1.	SUPERDIPLO	14/05/1998
2.	BEFESA MEDIO AMBIENTE	01/07/1998
3.	PAPELES Y CARTONES DE EUROPA	10/07/1998
4.	FEDERICO PATERNINA	16/09/1998
5.	ENACO	11/12/1998
6.	FUNESPAÑA	11/12/1998
7.	TRANSPORTES AZKAR	03/02/1999
8.	FERROVIAL	05/05/1999
9.	MECALUX	06/05/1999
10.	PARQUES REUNIDOS	26/05/1999
11.	TPI (Telefónica Publicidad e Información)	23/06/1999
12.	SOGECABLE	21/07/1999
13.	AMADEUS GLOBAL TRAVEL DISTRIBUTION	19/10/1999
14.	INMOBILIARIA COLONIAL	27/10/1999
15.	TERRA NETWORKS	17/11/1999
16.	PRISA	28/06/2000
17.	RECOLETOS COMPAÑÍA EDITORIAL	25/10/2000
18.	TELEFÓNICA MÓVILES	22/11/2000
19.	INDITEX	23/05/2001
20.	ENAGAS	26/06/2002
21.	FADESA INMOBILIARIA	30/04/2004
22.	GESTEVISION TELECINCO	24/06/2004
23.	CINTRA CONC. INFRA. DE TRANSPORTE	27/10/2004
24.	DERMOESTÉTICA	13/07/2005
25.	RENTA CORPORACIÓN	05/04/2006
26.	PARQUESOL	05/05/2006
27.	GRIFOLS	17/05/2006
28.	GAM (General de Alquiler de Maquinaria)	13/06/2006
29.	TÉCNICAS REUNIDAS	21/06/2006
30.	RIOFISA	19/07/2006
31.	VOCENTO	08/11/2006
32.	VUELING AIRLINES	01/12/2006
33.	CLINICA BAVIERA	03/04/2007
34.	REALIA	06/06/2007
35.	SOLARIA	19/06/2007
36.	ALMIRALL	20/06/2007
37.	CODERE	19/10/2007
38.	FLUIDRA	31/10/2007
39.	LABORATORIOS ROVI	05/12/2007
40.	IBERDROLA RENOVABLES	13/12/2007
Total number of IPOs		40

Table 2. Main characteristics of the IPOs in the Spanish capital market

The statistics in panel A refer to the sample of firms that went public through an IPO in the period of 1998-2009. The number of cases is 40. Panel B lists the statistics of the subsample of firms that went public before the application of the IFRS (23 cases), while panel C lists those that did so after the IFRS came into effect (17 cases). The table tests whether the mean, median and variance of the different variables are significantly different between the two subsamples. The test of the mean was performed using Student's *t*, the median was tested using the Kruskal-Wallis test, while the variance was tested using Levene's test. Initial return, shares placed and return on investment are expressed in percentages. Cash, market value, total assets, interest-bearing debt, net profit, depreciation and working capital are expressed in thousands of euros.

Panel A	Mean	Median	Standard deviation	Maximum	Minimum
Offering price ( <i>OFFP</i> )	13.44	12.51	6.48	30.00	3.31
Initial return ( <i>IR</i> )	11.46%	4.79%	30.10%	184.62%	-10.80%

<sup>1</sup> This entity was removed from the final sample because the admitted securities are non-voting shares and not voting shares as in other companies.

Table 2 (cont.). Main characteristics of the IPOs in the Spanish capital market

Panel A	Mean	Median	Standard deviation	Maximum	Minimum
Age ( <i>AGE</i> )	24.22	17.50	22.43	102.00	1.00
Shares placed (% <i>PLACED</i> )	35.54%	31.95%	17.16%	100.97%	9.02%
Market-to-book ratio ( <i>MTBR</i> )	29.72	5.94	92.84	562.52	1.21
Cash ( <i>CASH</i> )	524590.69	243546.86	745970.90	3586938.69	23439.61
Market value ( <i>MV</i> )	2874531.86	836326.38	6720443.76	39753502.10	52789.13
Total assets ( <i>ASSETS</i> )	976960.66	485110.22	1507483.24	6714868.32	735.71
Interest-bearing debt ( <i>IBD</i> )	318741.90	61336.74	679734.34	3928592.54	30.71
Net profit ( <i>NP</i> )	54198.95	20632.00	92419.17	510615.61	-29226.94
Depreciation ( <i>DEPREC</i> )	40906.11	8926.19	97313.91	587688.00	151.12
Return on investment ( <i>ROI</i> )	9.59%	8.47%	11.45%	42.40%	-35.92%
Working capital ( <i>WC</i> )	4364.23	14008.82	320963.75	628242.62	-1718787.40
Book value ( <i>BV</i> )	2.22	1.81	2.16	10.58	0.00
Panel B	Mean	Median	Standard deviation	Maximum	Minimum
Offering price ( <i>OFFP</i> )	12.74	12.40	5.13	23.50	3.31
Initial return ( <i>IR</i> )	14.88%*	4.81%	38.78%*	184.62%	-10.80%
Age ( <i>AGE</i> )	25.04	24.00	23.36	102.00	1.00
Shares placed (% <i>PLACED</i> )	37.37%*	30.89%	21.15%*	100.97%	9.02%
Market-to-book ratio ( <i>MTBR</i> )	33.63*	5.87	115.69*	562.52	1.21
Cash ( <i>CASH</i> )	633728.65	433795.07	793165.70	3586938.69	23439.61
Market value ( <i>MV</i> )	3809588.17	1277620.92	8259018.16	39753502.10	52789.13
Total assets ( <i>ASSETS</i> )	1211334.19	493810.79	1804397.77*	6714868.32	61216.10
Interest-bearing debt ( <i>IBD</i> )	417210.83*	61377.13*	848370.90*	3928592.54	53.24
Net profit ( <i>NP</i> )	65812.80	20750.95	115090.87	510615.61	-29226.94
Depreciation ( <i>DEPREC</i> )	58034.73*	10002.78*	123930.48**	587688.00	451.91
Return on investment ( <i>ROI</i> )	10.14%	9.40%	8.42%	25.44%	-7.27%
Working capital ( <i>WC</i> )	52056.44*	10060.94*	157992.28*	628242.62	-162868.24
Book value ( <i>BV</i> )	2.60	1.97	2.49	10.58	0.06
Panel C	Mean	Median	Standard deviation	Maximum	Minimum
Offering price ( <i>OFFP</i> )	14.39	14.00	8.03	30.00	4.40
Initial return ( <i>IR</i> )	6.83%	4.76%	10.09%	27.72%	-7.88%
Age ( <i>AGE</i> )	23.12	15.00	21.77	63.00	2.00
Shares placed (% <i>PLACED</i> )	33.07%	34.90%	9.56%	46.88%	17.79%
Market-to-book ratio ( <i>MTBR</i> )	24.10	7.60	46.35	186.12	2.05
Cash ( <i>CASH</i> )	376933.47	184162.16	671629.08	2933961.36	76554.31
Market value ( <i>MV</i> )	1609455.67	653654.28	3652423.23	15680086.32	160791.89
Total assets ( <i>ASSETS</i> )	659867.06	476409.65	936291.21	3413586.08	735.71
Interest-bearing debt ( <i>IBD</i> )	185519.23	44377.37	322165.56	1330357.76	30.71
Net profit ( <i>NP</i> )	38486.10	20513.05	46369.05	144426.76	-7854.75
Depreciation ( <i>DEPREC</i> )	17732.11	5439.90	31184.47	131497.89	151.12
Return on investment ( <i>ROI</i> )	8.79%	8.19%	15.06%	42.40%	-35.92%
Working capital ( <i>WC</i> )	99612.55	62352.51	515939.79	1012123.27	-1611359.67
Book value ( <i>BV</i> )	1.70	1.64	1.55	4.65	0.00

Notes: \*\*\*, \*\*, \* significantly different to the subsample that went public after the application of the IAS/IFRS, at the 1%, 5% and 10% level, respectively.

The statistics in Panel A in Table 2 refer to the 40 firms included in the sample of those that went public through an IPO during the period of 1998-2009 (see Table 1). Panel B lists the statistics of the subsample of firms that went public before the application of the IFRS (23 cases), while panel C lists those that did so after the IFRS came into effect (17 cases). The initial return, the shares placed and the return on investment are expressed in percentages. Cash, market value, total assets, interest-bearing debt, net profit, depreciation and working capital are

expressed in thousands of euros. In order to monitor the effect of inflation on these figures, the amounts have been deflated using the GDP deflator, which was obtained through the Bank of Spain's Statistical Bulletin, taking 1995 as base year.

The initial return on going public is defined as the difference between the final price at the close of the first day of listing on the market and the offering price divided by the latter. In terms of the mean, the level of underpricing for the companies in the sam-

ple under analysis is 11.46% for the period of 1998-2009. This level of underpricing is similar to that obtained by Álvarez and Fernández (2003), who reported an initial return of 11.63% for the period of 1985-1997, with different mechanisms of access to trading (fixed-price tenders, private offerings and direct admittance) being included in this time period. It would therefore appear that this anomaly or regularity persists in the Spanish stock market, presenting average values for the entire period.

In this respect, the mean underpricing in the case of the Spanish stock market is lower than the US market based on data provided by Ritter (2008), who reports an average initial return of 22.3% for the period of 1990-2008, although significant fluctuations exist throughout said period in the level of initial return, ranging from 70.9% for 1999 to 6% in 2008. A cooling of the market is also seen in the latter year in terms of the number of IPOs: only 19 in the US market, compared to 675 for the year 1996 or with average numbers of IPOs of between 100 and 300 for the majority of the years in the study period in this market.

The firms that went public during this period have an average age of 24 years, although there is considerable variability in this variable, with outliers that could distort this average (maximum of 102 years and minimum of 1 year). In general, the companies that began trading on the Spanish stock market were usually well-established firms. However, in this most recent period, the majority were young, not exceeding 20 years, which supposes a reduction in the average age with respect to the type of business that traditionally decided to take the step of going public. In this respect, Álvarez (2001a) shows that the firms that began trading on the stock market over the period of 1985-1997 averaged 31 years of operating history.

As regards the percentage of shares placed, it is around 35% in the initial offer; that is, companies follow a strategy of selling in stages, placing a significant, credible percentage at the time of going public and the remainder in subsequent public offerings. The market-to-book ratio, defined as the ratio between the market value at the end of the first day of trading and the book value of the shares is 29.72 for the entire sample under study. As regards book values, all the data was extracted from consolidated balance sheets. The most noteworthy figures for the firms that started trading are that they present a 9.57% return on investment and total mean assets of 976.96 million euros.

In order to analyze at an inferential level whether the hypotheses put forward in the previous section are true for the companies in panels B and C (sub-samples before and after the implementation of the IFRS, respectively), we test whether the mean, median and variance of the different variables are significantly

different from one subsample to the other. The test of the mean was performed using Student's *t*, the Kruskal-Wallis test was used to test the median, while the variance was tested using Levene's test.

Regarding Hypothesis 1 proposed in the previous section, in accordance with the changes that might be expected considering what the new accounting regulations represent, the results obtained entirely support this hypothesis. The mean underpricing for the sample of firms that went public before the application of the IFRS is 14.88%, that is significantly lower (specifically 6.83%) for companies that began trading on the Spanish market in 2005. This is a first result which shows that the new accounting information permits establishing an offer price which is much more credible to the users of this information and, therefore, the quantitative jump in price is much lower at the time of going public.

As regards Hypothesis 2, the results once more support the prediction put forward in the previous section. The market-to-book ratio of the firms that went public before the application of the IFRS presents a mean value of 33.63, significantly higher than the 24.10 shown by those that began trading in 2005. The market-to-book ratio is a measure of firm management and growth opportunities. The book value reflects historical investments, while the market value is a measure of the company's future financial prospects. The excess of market value over book value measures the value added to the firm as a result of management experience or market potential. The difference between these two values may be due to profits over and above the industry average, intangible assets not included in the balance sheet, or the perception of the firm's future investments. In this respect, the significant drop in this ratio after the application of the IFRS is a reflection of how the market values the new accounting information provided to its users.

For the remaining variables, there are very few other significant differences worth mentioning. There is a significant drop in interest-bearing debt in the balance sheets, as well as in depreciation subsequent to the application of the IFRS. Note should also be taken of a slight difference in the percentage of shares placed in the initial offering, favorable by 4 percentage points in the subsample prior to the implementation of the IFRS, and located in 37.37% of the firm's equity and in the working capital presented by companies that went public after 2005, almost double that of those that went public before said date.

In order to further evaluate the hypotheses proposed in the previous section, and on the basis of the variables for which one would expect significant differences in the results after the implementation of the IFRS, the following model is tested in this study:



$$IR = C + \alpha_1 \cdot DIFRS + \alpha_2 \cdot MR + \alpha_3 \cdot BV + \alpha_4 \cdot MTBR + \sum_{i=5}^n \alpha_i \cdot DIFRS \cdot X_i + \varepsilon. \quad (1)$$

In this model, the variable *IR* is measured as the initial return on going public, estimated as the difference between the final price at the close of the first day of trading on the market and the offering price divided by the latter. The independent variables were selected following the rationale set out in Section 1 of this paper, and are defined as follows:

- ◆ *DIFRS* is a dichotomous variable that takes the value 1 if the IPO takes place after the IFRS came into effect, and 0 otherwise.
- ◆ *MR* is the market return on the first day the firm is listed on the stock market, measured via the Madrid Stock Exchange General Index (IGBM).
- ◆ *BV* is the book value of the shares to be placed on the stock market.
- ◆ *MTBR* is the market-to-book ratio of the firm, estimated as the ratio between the market value and the book value of the shares of said entity at the close of the first day of trading.

The dichotomous variable *DIFRS* is included to measure the influence of the change in accounting standards on the initial return. The market return (*MR*) is included to discount the influence of this variable on the initial valuation of the securities. The variables *BV* and *MTBR* are included in the model to test the hypotheses put forward in Section 2.

Finally, the model includes the variable *HOT*, which is a dichotomous variable that takes the value 1 if the IPO takes place at a “hot” moment of the stock market cycle, and 0 otherwise. We understand this to mean when the number of IPOs is above the average for the period under study, and 0 otherwise. The differentiation between “hot” and “cold” periods as regards IPOs is considered in the financial literature for its possible influence on the level of underpricing of IPOs (Ritter, 1984).

In order to analyze whether a differential effect exists that might affect the initial return of the shares on the first day of trading as a result of the application of the IFRS, these same variables in interaction with the dichotomous variable *DIFRS* are added to the previously listed variables to thereby see whether there are significant changes in the effect of each on initial underpricing.

In alternative model estimates, we include control variables such as the firm’s total *ASSETS*, the *CASH* obtained in the IPO, estimated as the number of shares placed times the price of each, the variable *IBD*<sup>1</sup>, i.e., the firm’s interest-bearing debt included in the finan-

cial statements of the entity at the close of the year prior to the firm’s IPO, and the working capital (*WC*)<sup>2</sup>. All these variables will be included with the respective interaction with the dichotomous *DIFRS* in order to detect the possible differential influence as a result of the application of the accounting standards currently in force. The model estimates are likewise enhanced via the inclusion of dichotomous variables representing industry sectors in order to analyze the possible influence of the firm’s activity sector on its level of initial underpricing<sup>3</sup>. The next section presents the results of the proposed model, followed by the conclusions to be drawn from these results regarding the hypotheses set out in Section 2 of this paper.

#### 4. Results of the valuation of IPO and their relation to the IFRS

Prior to the estimation of the model presented in the previous section, an attempt was made to solve the problem of the possible existence of multicollinearity among the independent variables in the model to estimate, which might adversely affect the consistency of the results.

The variance inflation factor (*VIF*) was used to detect any such problem in the sample. This factor indicates the degree to which each independent variable is explained by other variables. Specifically, each variable is converted into a dependent variable that is regressed on the remaining variables. The expression for the variance inflation factor of the variable  $x_k$  ( $VIF_k$ ) is:

$$VIF_k = \frac{1}{(1 - R_k^2)}, \quad (2)$$

where  $R_k^2$  is the coefficient of determination obtained by performing the regression of  $x_k$  on the other variables. *VIF* values near unity indicate very low levels of collinearity<sup>4</sup>. The estimation of the *VIF* for the entire sample is shown in Table 3. Seeing as the values obtained for the variance inflation factor for all the variables are generally very close to unity, we may state that there are no problems of multicollinearity among the variables included in the model. The *CASH* of the offering and the *ASSETS* are found to be correlated on the basis of a prior

<sup>1</sup> Interest-bearing debt is calculated as the aggregate of bank debt and bonds issued plus debt to firms belonging to the group.

<sup>2</sup> Economic and financial returns are not statistically significant in any case and are finally not included in the estimates in the tables of results.

<sup>3</sup> For the sake of brevity, none of these variables has finally been included in the results of the estimates presented in the next section due to not being statistically significant in any case.

<sup>4</sup> Hair et al. (1999) state that there is no particular value that serves as a cutoff, but indicate that a  $VIF_k$  value for the variable  $x_k$  greater than 5.3 corresponds to a multiple correlation coefficient above 90%.

correlation analysis of all the available variables. Hence, these two variables are alternated in the estimates presented in this section.

Table 3. Variance inflation factor

Estimation of the variance inflation factor (*VIF*) for the full sample of firms that went public during the period of 1998-2009. *VIF* values close to 1 reflect the absence of problems of multicollinearity between the independent variables finally used.

	$R_k^2$	$VIF_k$
<i>DIFRS</i>	0.0896	1.0984

<i>MR</i>	0.0569	1.0603
<i>BV</i>	0.4626	1.8608
<i>BTMR</i>	0.4155	1.7108
<i>ASSETS</i>	0.0641	1.0685
<i>WC</i>	0.1435	1.1675
<i>IBD</i>	0.0610	1.0649
<i>HOT</i>	0.1879	1.2314

The results of the estimation of the model by ordinary least squares proposed in equation (1) are given in Table 4.

Table 4. Results of the valuation of IPO and their relation to the IFRS

The table presents the values of the coefficients in the regression models estimated by means of ordinary least squares, in which the dependent variable is the IR (the firm's initial return on going public). The independent variables are *DIFRS*: a dichotomous variable that takes the value 1 if the IPO takes place after the IFRS went into effect, and 0 otherwise; *MR*: the market return on the first day the firm trades on the stock market; *BV*: the book value of the shares to be placed on the stock market; *MTBR*: the market-to-book ratio of the firm estimated as the ratio between the market value and the book value of the shares of said entity; *HOT*: a dichotomous variable that takes the value 1 if the IPO takes place at a "hot" moment to go public, and 0 otherwise; *CASH*: the cash obtained from the IPO; *WC*: working capital; *IBD*: interest-bearing debt of the firm during the year before the IPO; and *ASSETS*: total assets in the year before the firm went public.

Variable				
<i>C</i>	0.1398*** (2.7025)	0.1787** (2.0379)	0.2014** (2.2554)	0.1961** (2.3779)
<i>DIFRS</i>	-0.2751** (-2.6665)	-0.3126*** (-2.9553)	-0.3169*** (-3.0120)	-0.3151*** (-3.0469)
<i>MR</i>	3.8314** (2.0064)	3.8561** (2.4236)	3.8971** (2.4525)	3.5801** (2.2651)
<i>BV</i>	-0.1298*** (-4.7841)	-0.1430*** (-4.9302)	-0.1404*** (-4.8511)	-0.1356*** (-5.0165)
<i>DIFRS*Bv</i>	0.1710* (1.8753)	0.1921** (2.0474)	0.1982** (2.1213)	0.1994** (2.1600)
<i>MTBR</i>	-0.00004*** (-3.5276)	-0.00005*** (-3.7522)	-0.00005*** (-3.6788)	-0.00005*** (-3.7068)
<i>HOT</i>	0.0607 (1.0160)	0.0355 (0.5229)	0.0159 (0.2286)	0.0165 (0.2435)
<i>CASH</i>		-5.31E-11 (-1.3164)	-3.71E-11 (-0.8767)	
<i>WC</i>		0.0015 (0.4924)	0.0014 (0.4458)	0.0015 (0.4879)
<i>IBD</i>			-4.71E-11 (-1.1734)	-6.88E-12 (-0.1139)
<i>ASSETS</i>				-3.26E-11 (-1.0946)
Adjusted $R^2$	36.16%	36.79%	37.55%	38.41%
Durbin-Watson	2.0371	2.1493	2.0762	2.0812
F	4.6819	3.8373	3.6054	3.7022
Prob (F-statistic)	0.0015	0.0031	0.0038	0.0032

Notes: \*\*\*, \*\*, \* significantly different to zero for a 1%, 5% and 10% level of significance. *t*-statistic in parentheses.

The market return on the day of going public is included in the model to take into account the influence of this variable on the initial valuation of the securities. It is found to have a positive and statistically significant coefficient in all the regressions. In the estimates shown in Table 4, the first column presents the results with the regressors related to the test of the hypotheses presented in Section 2 of this paper. The following columns include variables such as the cash obtained from the offering (*CASH*), the working capital (*WC*), the interest-bearing debt (*IBD*) and the *ASSETS*, this last variable alternating

with the *CASH* obtained from the offering, given the aforementioned issue of correlation.

The results of the model estimation fully corroborate Hypothesis 1 and Hypothesis 2 as proposed in Section 2 of this paper.

Regarding Hypothesis 1, as can be seen, the variable *DIFRS* presents a negative and statistically significant sign. This shows that the initial underpricing of company shares after the IFRS went into effect is significantly lower. This result confirms that the accounting information available to users starting

January 2005 allows them to make a closer valuation of the shares of the company which therefore results in these shares being more accurately assessed when placed on the market. In short, this initial share valuation, the offering price estimated using the new information, is more credible to users and therefore the quantitative jump in price on the first day of trading is much lower.

As to Hypothesis 2, the results show that there is a negative relationship between the market-to-book ratio and the level of underpricing; that is, the greater the ratio between the market value and the book value of the firm, the lower the level of underpricing of its shares. However, the interaction of the variable *DIFRS* with this ratio is not found to be significant. The regressions in Table 4 do not include those interactions with the variable *DIFRS* that are not statistically significant. This shows that although – as may be expected *a priori* – there is a negative relation between the market-to-book ratio and the level of underpricing, no significant differences are observed in this influence in the periods before and after implementation of the IFRS. Nonetheless, as pointed out in the previous section, there is a significant decrease in the level of this ratio as a consequence of the application of the IFRS, a result that provides support for the hypothesis.

With regard to Hypothesis 3, it can be seen that shares with a higher book value present a lower level of underpricing. That is to say, the higher the book value of the firm's shares, the lower the level of initial yield, given that the coefficient of the variable *BV* is negative and statistically significant at the 99% level. A change of sign is produced for this variable with shares listed on the market after the application of the IFRS, seeing as the variable is positive and statistically significant. That is to say, once the new regulations had been adopted, those shares with a higher book value according to the financial statements prepared in accordance with the IFRS offer a greater return on their first day of trading.

With respect to the other variables included in the estimates, it should be noted that neither the market situation, nor the cash obtained from the offering, nor the control variable of firm size nor the working capital are statistically significant. Therefore, it cannot be stated that larger firms, or those with larger volumes of cash obtained from their initial offering, present a higher level of initial return when going public, as there are no differences in this respect between companies that went public before and after the application of the IFRS. However, a negative relationship is observed between the level of underpricing and interest-bearing debt (*IBD*), though it does not reach conventional levels of significance. No significant differences were observed for this variable either after the

application of the IFRS, and so the interaction of this variable with the dichotomous variable *DIFRS* was not included in the estimates.

All the regressions presented in Table 4 show an adjusted coefficient of determination greater than 35%, with an F-statistic significant at the 99% level, which, together with Durbin-Watson values close to 2 in all cases, highlights the goodness of the estimates carried out<sup>1</sup>.

Table 5. The explanation of the IPO's offering price

The table presents the values of the coefficients in the regression model estimated by means of ordinary least squares, in which the dependent variable is the *OFFERING PRICE* of the firm going public. The independent variables are *BV*: the book value of the shares to be placed on the market and its interaction with *DIFRS*: a dichotomous variable that takes the value 1 if the IPO takes place after the IFRS came into effect, and 0 otherwise.

Variable	
<i>C</i>	11.5369*** (10.9709)
<i>BV</i>	0.4492 (0.8155)
<i>DIFRS*BV</i>	-0.2581 (-0.1572)
Adjusted <i>R</i> <sup>2</sup>	-3.53%
Durbin-Watson	1.8942
<i>F</i>	0.3340
Prob ( <i>F</i> -statistic)	0.7181

Note: \*\*\*, \*\*, \* significantly different to zero for a 1%, 5% and 10% level of significance. *t*-statistic in parentheses.

Finally, in order to further test Hypothesis 3, Table 5 presents the regression of the offering price with respect to the book value of the shares, as well as the interaction of this variable with the dichotomous variable *DIFRS*. The results show that there is no statistically significant relationship between the offering price of shares and their book value in accordance with financial information, with no differences in this valuation being observed for firms that began trading in the period of 2005-2009. This result does not allow us to accept part of the third hypothesis, thus leading to the conclusion that, when fixing the offering price – usually the result of an agreement between the directors of the company going public and the broker who manages the operation – other factors are taken into account, such as the data obtained from book-building in the period prior to the firm's IPO. This information is collected, as stated above, through the building of the order book.

<sup>1</sup> The Durbin-Watson statistic confirms the null hypothesis that the residuals of a regression are independent, as opposed to H1 which assumes that the residues follow a first-order autoregressive process. The Durbin-Watson ranges between 0 and 4: a value close to 2 indicates low autocorrelation; a value between 2 and 0 indicates positive autocorrelation; while a value between 2 and 4 indicates negative autocorrelation.

## Conclusions

This paper has analyzed the consequences of the application of the IFRS on the valuation of firms going public on the Spanish stock market. Using a database consisting of companies that went public in Spain during the period of 1998-2009, we have estimated a model that has allowed us to test the proposed hypotheses resulting from an analysis of the possible consequences of the application of the IFRS on the valuation of quoted shares, when these had not been previously traded.

The interest of this analysis lies, on the one hand, in the lack of research aimed at analyzing the effect that the application of these accounting standards may have on firms that decide to go public and, on the other, in the fact that, for such companies, as they have never traded on the stock market, the only information available to new shareholders is the accounting information provided in the prospectus for admission to the stock exchange. This empirical study has thus allowed us to analyze the effect the new regulations included in the IFRS has on the firm's future valuation in the capital market. As indicated in the theoretical section of this paper, the philosophy of international accounting standards is to increase the quality of financial information so that it is useful to users when making financial decisions.

The results are largely favorable to the hypotheses put forward in this study in terms of the changes expected due to the application of the new accounting standards. It is observed that the initial underpricing of company shares after the IFRS became effective is significantly lower. This shows that the accounting information available to users starting

January 2005 allows them to make a closer valuation of the shares of the company, which therefore results in these shares being more accurately assessed when they are first listed on the market. This is the core result of the study which allows us to conclude in favor of the quality of the new financial information on companies going public. There is consensus that the IFRS provide a higher degree of disclosure than the General Accounting Plan, which may mean that the market has more information. This may help explain the results obtained in this study from the economy-of-information perspective.

Furthermore, the results of this research show that there is a negative relationship between the market-to-book ratio and the level of underpricing; that is, the greater the ratio between the market value and the book value of the firm, the lower is the level of underpricing of its shares. Finally, an inverse relationship is found between the book value of the shares and the level of initial underpricing, which changes sign for companies going public subsequent to 2005 as a consequence of the application of the new regulations.

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