Emerald Insight

Academia Revista Latinoamericana de Administración

Article information:

Users who downloaded this article also downloaded:

For Authors

If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

FINANCE
Firm characteristics and intellectual capital disclosure in IPO prospectuses

Características de las empresas y revelación de capital intelectual en los folletos de emisión

Leire Alcaniz and Fernando Gomez-Bezares
Department of Finance and Accounting, University of Deusto, Bilbao, Spain, and
Jose Vicente Ugarte
Department of Quantitative Techniques, University of Deusto, Bilbao, Spain

Abstract

Purpose – Initial Public Offerings (IPOs) have been studied from different perspectives. The purpose of this paper is to analyse the type of intellectual capital (IC) information provided in the Spanish IPO prospectuses and the characteristics of the firms that go public and supply more information. The paper also compares the results with similar previous studies carried out in different countries.

Design/methodology/approach – The database gathers Spanish IPOs from 1996 to 2007 (after which the number of IPOs in Spain plummeted due to the crisis). Content analysis is used to obtain information about IC from the IPO prospectuses and, afterwards, the authors apply different statistical methods to analyse any relation between IC disclosure and firms' characteristics.

Findings – The paper concludes that the companies that provide more information about IC in IPO prospectuses are high-tech companies, larger firms and those whose previous shareholders do not retain the majority after the IPO.

Originality/value – The authors have created an original database with the Spanish data. Moreover, this is the first study with these characteristics carried out in Spain, and some original conclusions are obtained, such as the importance of retained share percentage by previous shareholders. The authors have developed a statistical methodology suitable for the data. Both, the conclusions and the methodology will be especially useful for markets such as the Latin American ones, which are not as developed as Anglo-Saxon markets.

Keywords Initial public offering, IPO prospectus, Intellectual capital, Content analysis, Non-accounting information

Paper type Research paper

Resumen estructurado

Propósito – Las Ofertas Públicas Iniciales (OPIs) se han estudiado desde distintas perspectivas. Este artículo trata de analizar qué tipo de información sobre capital intelectual se suministra en los folletos de emisión de las OPIs españolas y las características de las empresas que salen a bolsa que proveen de más información. El trabajo también compara los resultados con estudios previos similares llevados a cabo en distintos países.

Diseño/metodología/enfoque – La base de datos recoge las OPIs españolas desde 1996 a 2007 (tras este año, debido a la crisis, las OPIs españolas casi desaparecieron durante varios años). Se emplea el análisis de contenidos para recopilar la información sobre capital intelectual (CI) de los folletos de emisión y, tras ello, los autores aplican distintos métodos estadísticos para analizar la relación entre el suministro de información sobre CI y las características de las empresas.

Resultados – El estudio concluye que las compañías que proveen más información sobre CI en los folletos de emisión son las altamente tecnológicas, las más grandes y aquéllas en las que sus antiguos accionistas no mantienen la mayoría tras la OPI.

Originalidad/valor – Los autores han creado una base de datos original con información española. Además, éste es el primer estudio de estas características realizado en España y obtiene algunas conclusiones originales como la importancia del porcentaje de acciones mantenido por los antiguos accionistas. Los autores han desarrollado una metodología estadística adecuada a los datos disponibles. Tanto las conclusiones como la metodología serán especialmente útiles para aquellos mercados que no se encuentran tan desarrollados como los anglosajones, como por ejemplo los mercados latinoamericanos.

Palabras clave Oferta Pública Inicial, folleto de emision, capital intelectual, análisis de contenido, información no financiera

Tipo de trabajo Trabajo de investigación

1. Introduction

In recent years, developed economies have been intensive on services and knowledge-based companies. These kinds of firms base their value creation on intangible resources that cannot be assessed using traditional financial measures. Concepts such as research and development (R&D), innovation, sustainability and corporate social responsibility are gaining importance and are part of the intellectual capital (IC) of the firm. There is a widely accepted definition of IC as knowledge, applied experience, organizational technology, customer relationships and professional abilities, which provide competitive advantage in the market (Edvinsson and Malone, 1997). IC can be divided into three main pillars: human capital (HC), structural or internal capital (SC) and relational or external capital (RC). The first one gathers knowledge, abilities, leadership, teamwork and other capacities, which are possessed by employees individually. Structural capital is possessed by companies and it takes into account databases, structural organization, management processes, know-how and R&D among other issues. Finally, relational capital deals with interactions between the firm and its external stakeholders, including elements such as, brand, image or commercial power (Edvinsson and Malone, 1997; Boedker *et al.*, 2005). There is a basic process for knowledge creation, where HC improvements will increase structural capital, and this will improve the stocks of relational capital (Jardon and Martos, 2012). These three forms of capital are interlinked (Mention and Bontis, 2013).

These three pillars are sources of competitive advantage and value creation for companies and their importance has increased during the last decades (Nakamura, 2003). The OECD (1996) recognized HC as the key to increasing competitiveness and wealth at country level; thus, HC should also be considered as a source of competitive advantage at firm level. The "knowledge-worker" and the "knowledge-creating company" create "sustained and trusted relationships" as a key for business competitiveness (Martín-de-Castro *et al.*, 2011). Companies with higher levels of IC or better IC efficiency,

have more competitive advantage and a better performance (Ireland *et al.*, 2002; Chen *et al.*, 2005; Kamukama *et al.*, 2011; Barrick *et al.*, 2015).

Therefore, firms should disclose information about their IC so that investors know about the real situation of the company in terms of physical, financial and IC and can, therefore, make better decisions (Holland, 2003; Riahi-Belkaoui, 2003; Marr, 2005). However, financial rules do not allow us to recognize all these elements as they are difficult to measure and value; in fact, only some of them are recognized in financial statements as intangible assets considering they must fulfil hard and specific conditions. Currently, annual accounts are failing to predict the stock price, because of the IC resources that are missing in the balance sheet (Lev, 2001). The scarcity of accounting information about IC makes it difficult to develop research and IC management (Shakina and Barajas, 2014). That is why firms require the creation of new ways to measure and communicate IC, which they have done by employing qualitative methods as well as other methods that try to measure or value elements related to IC, e.g., the Balanced Scorecard (Kaplan and Norton, 1996, 2008) and the International Integrated Reporting (IIR Council, 2013).

Accounting rules do not require companies to report on total IC, but there are situations in which companies may be interested in providing more information than is strictly required (Beyer *et al.*, 2010). It is of vital importance, for example, for potential new investors to know about companies going public for the first time by an initial public offering (IPO). Unlisted companies often have less impact on the media and they are not required to provide as much information as listed companies. In this case, when they go public, they do not only offer traditional financial information, but also complementary data that may be of interest to potential shareholders for a better valuation of the company. Financial markets try to be more transparent and for this to happen a series of European directives try to improve the information supplied in the prospectuses where many of the proposed changes are based on non-accounting information. Clearly, the quality of the information offered by companies is highly appreciated by the market (Martínez-Ferrero, 2014) and that is why this study focuses on IC information that is an increasingly important facet of information.

Currently, there is growing interest in IPOs (Dambra *et al.*, 2015; Doidge *et al.*, 2013). Previous literature has shown that there are excess returns on IPOs (see, e.g. Lowry *et al.*, 2010), implying a higher cost of equity capital. So in an attempt to reduce the information asymmetry, firms provide non-financial information, which is considerably decisive when making investment decisions (Balatbat, 2006; Guo *et al.*, 2004).

Companies going public, in addition to the audited financial statements, supply an IPO prospectus, which includes non-accounting information. It is expected, therefore, that if they provide more information, they will get a better offer price and a lower cost of capital (Guo *et al.*, 2006; Hsu *et al.*, 2012). Several studies analyse non-financial information provided by companies in the IPO reports in different countries (Bukh *et al.*, 2005 in Denmark; Cordazzo, 2007 in Italy; Cazavan-Jeny and Jeanjean, 2007 in France; Rimmel *et al.*, 2009 in Japan) to try to determine what kind of companies provide more information on IC in their prospectuses. The objective of this paper is to examine, first, which IC elements are most frequently commented on by Spanish firms in the IPO prospectuses and, second, whether the type of information supplied depends on the specific characteristics of firms or IPOs. Although prior studies have addressed this research question, this paper differs in four different perspectives. First of all, the hypotheses are developed based on the four theories proposed by An *et al.* (2011) which enhance voluntary IC disclosure (agency theory, signalling theory, legitimacy theory

and stakeholder theory), while prior papers are basically based on agency and signalling theories. Second, these kinds of studies are undertaken in countries where stock exchange markets are widely developed. In this case, our market of reference has some special characteristics that will be explained below. Moreover, the period considered is longer than usual, and this allows us to verify whether the IPO moment influences information disclosure. Third, this paper considers some different explanatory variables to the common prior literature and, finally, the study uses a different statistical approach specific for the characteristics of the market.

For the analysis, we consider the IPOs in Spain. It is very interesting to study the Spanish market because although the stock exchange market has been sophisticated during the last 25 years, its IPO development is quite low compared to other European countries or main worldwide capital markets. Spanish companies, a great percentage of them SMEs, are reluctant to supply information and be transparent, which is essential when it comes to entering capital markets to obtain funds. Latin American stock markets are very similar in this sense, as the number of IPOs has been quite low and, culturally, companies are also reluctant to disclose information (Aggarwal *et al.*, 1993; Patel and Dallas, 2002). When companies go public, the offer price is usually under-priced all over the world. Studies in Chile (Gregoire and Castillo, 2009) or Mexico (Hensler *et al.*, 2000), among others, have confirmed this. This means that firms are leaving money on the table.

Moreover, Latin America's future is linked to the creation of strategic alliances and networks among companies in order to innovate and to take advantage of their individual resources (Sanz and Jones, 2013). Hence, the information about IC or intangible resources is increasingly important, not only to manage the firm, but also to disclose the reality of the organizations, beyond financial information and get more reliable valuations of the companies. Some of those countries, such as Brazil, Chile or Ecuador are improving their accounting information through the adoption of IFRS in order to "allow the different participants of the market evaluate the company in a more proper manner" (Jara Bertín and Arias Moya, 2013, p. 140). In the case of the Novo Mercado of BM&F Bovespa of Brazil, companies listed in that market must fulfil additional information requirements. In doing so, they get a better market value (Rossoni and Machado-da-Silva, 2013), although the information required is mostly related to financial statements and corporate governance, and not to IC information. There is much to be done in these markets in order to improve transparency and, specifically, IC information disclosure. Due to the fact that Latin American and Spanish markets are culturally and legislatively similar and different to Anglo-Saxon markets, our study could be interesting for academics, practitioners and LATAM and Spanish regulatory bodies.

The database used in this paper has been gathered specifically for this research using information provided in the IPO prospectuses of companies going public from 1996 to 2007. IC information is measured through the indicator proposed by Bukh *et al.* (2005) and Cumby and Conrod (2001), already tested in prior studies. Besides, we explain the IC disclosure with variables related to company characteristics (sector, size and age) and the IPO (period and retained ownership). We use an original methodology for the analysis adapted to financial markets with a smaller number of companies quoting on the stock exchange. This is more common in Latin American stock exchanges than in the Anglo-Saxon markets.

The paper concludes that high-tech organizations, larger firms and companies whose previous shareholders do not retain the majority after the IPO provide more information about their IC. These results demonstrate that firms really think that they can mitigate the effect of bad signals, such as low levels of retained ownership after the IPO, disclosing more information. They are also aware of the importance of

showing their IC when their competitive advantage comes through knowledge or R&D in order to reduce information asymmetries and agency problems. And, finally, we demonstrate that big companies are persuaded to provide more information in order to be legitimated by society and to go through a more successful IPO process.

This study will be structured as follows. In the next section, the authors will develop the hypotheses that can affect the amount of information disclosed in prospectuses. In the third section, there will be an explanation of how the database has been created. This explanation will address the sample of firms, their characteristics and also the IC information that will be examined. The third section ends by explaining the research methodology. In the fourth section, the authors show the results of the econometric models. Finally, some conclusions will be discussed.

2. Hypothesis development

In this section, we will explain which firm or IPO characteristics could influence the information provided by companies in their IPO prospectuses. IC disclosure is based on four different theories: agency theory, signalling theory, legitimacy theory and stakeholder theory (An *et al.*, 2011). Agency theory (Jensen and Meckling, 1976) states that the objectives of management and shareholders are usually not aligned. This will generate a problem of lack of confidence by the latter, aggravated by the asymmetric information. The management will have a better knowledge of the company as they are in the organizational operating activity. In order to decrease the asymmetry, managers should provide additional information. In fact, when the company is going public, the firm needs to attract new investors and as the IC is a value driver for organizations, firms should be open to disclose this kind of data. Decreasing the asymmetry could reduce the IPO's cost of capital (Singh and Van der Zahn, 2008).

For example, companies whose sources of competitiveness are knowledge, research or employees will have more information about IC and will be willing to supply it in their prospectuses to show their non-financial situation. Many studies have tried to check whether the sector influences the information provided by firms studying IPO prospectuses (see Bukh *et al.*, 2005; Bozzolan *et al.*, 2006), or annual financial statements of listed companies (e.g. Cordazzo, 2007; Mangena *et al.*, 2010). They have achieved significant results in the proposed sense. According to the accounting rules, the most important factors of competitiveness of technological and knowledge-based companies cannot be shown. The business of those kinds of firms depends on IC components that will be explained to investors through non-financial information.

Specifying by categories, high technology and knowledge-based firms, where employees are key resources, which cannot be replaced easily, should show more information about HC. Their work requires specific knowledge and advanced skills to solve complex problems, such as creating new products, eradicating diseases, etc. Furthermore, the structural capital should be higher in high-tech companies, as they are intensive in R&D and information technologies. Finally, with regard to relational capital, differences are not expected according to the sector. Any potential investor might be interested in the expected demand and the interactions among stakeholders within the firm, regardless of its sector. However, in general, high-tech companies should disclose more IC information. Our purpose is to observe whether these kinds of organizations are aware of the importance of their IC and prepared to disclose it, in order to obtain more funds in the IPO:

H1. The sector of the individual firm influences the IC information provided in the IPO prospectus.

The asymmetric information is different according to the age of the organizations. Younger companies should provide more data as they usually are not well established and will not be as well known among investors, who will be assuming a higher risk. Kim and Ritter (1999) explained that younger firms do not get such a positive and accurate valuation when they use only historical information, as when they use other indicators, such as the expected profits. We think that non-financial information should assist investors in their valuation.

Other studies have raised the same hypothesis in terms of IPOs. Rimmel *et al.* (2009) or Rashid *et al.* (2012) found significant results in this sense. However, other studies have not achieved significant results related to age (Bukh *et al.*, 2005; Cordazzo, 2007). The purpose of this paper is to add to the discussion around this topic and support the IC disclosure as a way of reducing the information asymmetry and the agency problem, looking at the characteristics, which are more decisive in moderately developed markets:

H2. The age of the firm when it goes public negatively influences the IC information provided in the IPO prospectus.

On the other hand, if existing shareholders will get less involved in the firm after the IPO, the company will need to sell more shares on the market. In that circumstance, the firm will need to disclose more information so that investors are better informed (Guo *et al.*, 2004; Cazavan-Jeny and Jeanjean, 2007).

In this case, besides the agency problem, the signalling theory (Ross, 1977) also has an effect on disclosure. The signalling theory specifies that asymmetric information could be reduced by signals; that is, actions or behaviours of the firm. In the case of a company going public, the retained ownership of previous shareholders is a signal of the firm's future performance. If shareholders are selling a high percentage, new investors may think that the company will not perform well in the long term. If previous shareholders retain a very high percentage in the company, the market will perceive a positive involvement of the current shareholders and their trust in the future of the firm (Leland and Pyle, 1977). Therefore, in this paper we will observe whether low-retained ownership means that the firm has to compensate for the unsatisfactory sign by disclosing more information:

H3. The retained ownership by previous shareholders negatively influences the IC information provided in the IPO prospectus.

The legitimacy theory is the third theory mentioned above to enhance IC disclosure. This theory states that companies have an obligation with society and that they have to operate within the bounds and norms of their respective societies (Brown and Deegan, 1998; Kent and Zunker, 2013). The behaviour of the firm is important and is the way in which the organization gets involved with different stakeholders. Consequently, the company will have to disclose more information than just financial or compulsory data.

Different studies about information disclosure conclude that bigger companies tend to provide more information than smaller ones. As explained in Chavent *et al.* (2006), larger, better-known firms, may be more vulnerable to government intervention or litigation. That is why they will be willing to provide more information. Moreover, as they can cope with the costs to provide more data and may feel more protected against competitors when revealing information (in this regard see also the results achieved by Ahmed and Courtis, 1999), bigger companies are in a better position to fulfil society's information requirements and, as such, gain legitimacy. In addition, larger companies would have more employees and would need complex processes and elaborated

organizational structures in order to operate properly; therefore, they should provide more information about human and structural capital:

H4. The size of the firm positively influences the IC information provided in the IPO prospectus.

Finally, the stakeholder theory (Freeman, 1994) states that the shareholder is not the main component of the firm. Different stakeholders participate by creating competitive advantage and a better performance for the company, and some of them are essential for the success of the business (Watts and Zimmerman, 1986). Hence, it is not only future investors that will be interested in the firm going public, but other participants will also want to know more about the situation of the firm, the IPO and its implications. In recent years, different stakeholders have been increasingly interested in the information about IC, as this could reduce the information asymmetry, improving the relationships between managers and the rest of the stakeholders (An *et al.*, 2011).

Thus, the elements within the IC concept have become increasingly relevant for companies over time. At the same time, changes in legislation have made it compulsory for firms to provide more information about non-financial concepts. Therefore, it is expected that companies that have recently gone public provide more information on IC in general terms rather than those which went public before. García-Meca and Martínez (2007) found in a study focused on financial analysts' reports that in Spain IC information provided in 2003 is better than IC information provided in previous years. An objective of this paper is to check whether the interest in IC has been increasingly important also for this specific moment in the life of the firm, when it is going public:

H5. The year (or period) when the firm went public positively influences the IC information provided in the IPO prospectus.

3. Sample selection, variables and methodology
In this section, we will describe the sample used in the research, the independent and dependent variables and the methodology we have used in the study.

3.1 Sample selection
For this study, the sample gathered information about the IPOs performed between 1996 and 2007 in the Spanish stock market (63 firms). Companies had to be based in Spain. There were no IPOs in 1995 and prior prospectuses were not available. Due to the economic crisis that began in 2008, the number of IPOs has fallen drastically. Some of them have chosen to be listed on the *Mercado Alternativo Bursátil* (Alternative Stock Market), whose requirements are easier to fulfil and which is aimed at smaller companies. In fact, there are only two IPOs from 2008 to 2013 that fulfil all the requirements to be included in the database. However, we have not included them because they would distort our results. From the total 63 companies which started trading in the Spanish stock exchange interconnection system from 1996 to 2007, the first screening of data demonstrated that two companies were based outside of Spain, the second data screening showed that three firms were already trading in some of the Spanish stock exchange markets and, finally, two companies had already gone public before. After applying those filters, the number of companies in the sample diminished to 56. The database has been created *ad hoc* for this research.

3.2 Firm and IPO characteristics

This study is going to analyse the following company characteristics: the sector; the year (period) when the firm went public; the age of the company; company size (measured by number of employees, sales and assets); and the shareholders' ownership held after the IPO. These characteristics will operate as explanatory variables in the models that will be developed to contrast the hypotheses.

Companies are divided into two sectors. High-tech companies, including knowledge, R&D or information technologies based firms, and low-tech companies, including communication, services and production companies. Authors such as Bukh *et al.* (2005) or Mangena *et al.* (2010) have also used this division. Table I shows the firms' distribution by sector and year when they went public.

Table II, Panel A, shows the descriptive statistics of size, measured by the number of employees when the firm goes public, the total assets and the total sales of the firm in the year previous to the IPO, age and previous shareholders' ownership after the IPO.

Spanish companies going public are larger than Danish and Japanese firms when they are measured by number of employees (Rimmel *et al.*, 2009), and larger than French firms (Cazavan-Jeny and Jeanjean, 2007) when measured in terms of sales. In addition, Spanish companies had an average age of 27 years when they went public, similar to the Danish market, but older than firms in France, Japan, Malaysia (Rashid *et al.*, 2012) or Singapore (Singh and Van der Zahn, 2008).

Table II, Panels B and C, show the relationship between these characteristics using Pearson's and Spearman's correlation coefficients. As expected, the three variables measuring size are positively related. Note that although Pearson's correlation coefficient reflects no significant relationship between employees and assets, Spearman's correlation coefficient does.

| | Sector | | | |
	High-tech	Low-tech	Total no. of IPOs	%
Year				
1996	1	2	3	5
1997	0	7	7	13
1998	1	6	7	13
1999	6	3	9	16
2000	2	2	4	7
2001	1	1	2	4
2002	0	1	1	2
2004	0	3	3	5
2005	1	0	1	2
2006	4	5	9	16
2007	7	3	10	18
Total	23	33	56	
%	41	59	100	100

Table I.
Number of companies by firm sector and IPO year

Notes: This table shows the distribution of companies by sector and year when companies went public (from 1996 to 2007). Companies are divided in two sectors: high-tech companies (including knowledge, R&D or information technologies based firms) and low-tech companies (including communication, services and production companies)

Panel A: descriptive statistics	Mean	SD	Minimum	Median	Maximum
Size					
No. of employees (thousands)	2.991	5.244	0.038	0.984	27.607
Sales (mill. €)	533.67	865.32	9.03	218.38	4,361.69
Assets (mill. €)	1,288.67	3,593.32	16.55	327.81	25,912.72
Age (no. of years)	26.53	25.19	1.00	22.75	115.00
Previous shareholders (%)	65.34	15.95	9.38	69.43	96.54

Panel B: Pearson's correlations	Employees	Assets	Sales	Age	Previous shareholders
Employees	1.0000	0.1088	0.7412***	0.1580	0.0834
Assets	0.1088	1.0000	0.4447***	−0.0380	0.1635
Sales	0.7412***	0.4447***	1.0000	0.0443	0.1473
Age	0.1580	−0.0380	0.0443	1.0000	−0.0008
Previous shareholders	0.0834	0.1635	0.1473	−0.0008	1.0000

Panel C: Spearman's correlations					
Employees	1.0000	0.5096***	0.7239***	0.0011	0.1538
Assets	0.5096***	1.0000	0.8724***	0.0417	0.2187
Sales	0.7239***	0.8724***	1.0000	0.0521	0.1837
Age	0.0011	0.0417	0.0521	1.0000	−0.0748
Previous shareholders	0.1538	0.2187	0.1837	−0.0748	1.0000

Notes: $n = 56$ firms. This table shows in Panel A the basic descriptive statistics of variables measuring the size, age and retained ownership. The size is measured using the number of employees, total sales and total assets. Total sales and assets are in millions of Euros of 1995. The age is the number of years from the creation of the company until the moment of the IPO. The previous shareholders (%) is the retained ownership by previous shareholders after the IPO in percentage. Panel B and C show their Pearson's and Spearman's correlation coefficients. *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

Table II.
Summary statistics
for size, age and
previous
shareholders'
ownership

3.3 IC information

We will employ the methodology of content analysis when measuring IC information in IPO prospectuses. The indicator intends to specify the amount of information disclosed in the prospectus. This indicator is developed with various items related to IC and we can assume that those companies that have more IC will be more interested in mentioning more items rather than companies with a less IC. See Equation (1) for the indicator measuring the total number of items supplied in the prospectus and Equation (2) for the IC disclosure index (in percentages):

$$TOTAL\ IS = \sum_{i=1}^{M} d_i \tag{1}$$

$$IS\ Disc\ (\%) = \frac{\sum_{i=1}^{M} d_i}{M} \times 100 \tag{2}$$

where *TOTAL IS* is the total number of supplied items; d_i equals 1 when firm talks about item i in the IPO prospectus and 0 when firm does not talk about it; M the total

number of items, 86 in this case; and *IS Disc* (per cent) the percentage of the number of items supplied over the total number of items.

We have chosen a total of 86 items, adding some to those proposed by Bukh *et al.* (2005) and Cumby and Conrod (2001), in order to consider some important ideas such as the information about a company's products which is related to the innovation and change capacity, or customer satisfaction or awards received by the company which are a sign of external recognition. Items are divided into three commonly accepted IC categories: HC; structural capital (SC); and relational capital (RC) (see Appendix 2). This division into three categories is also used by some authors, such as Guthrie and Petty (2000), Mangena *et al.* (2010).

Table III shows the descriptive statistics of these variables. We can see the characteristics of the total information indicator and the information by categories. The average of the total information (according to the IC disclosure index) supplied by Spanish IPO prospectuses is higher than other cases such as Denmark (Bukh *et al.*, 2005) or Japan (Rimmel *et al.*, 2009), but similar to Singapore (Singh and Van der Zahn, 2008), Malaysia (Rashid *et al.*, 2012) or Italy (Cordazzo, 2007).

If we look at the division into three groups, relational capital is the category that mentions more items over its total number of items, followed by HC and finally, structural capital. This is due to increasingly important interactions with external stakeholders, so companies will pay special attention to this type of IC. Several studies have similar results, where relational capital or customers are the most frequently mentioned categories (Guthrie and Petty, 2000).

3.4 Statistical methodology

The hypotheses in Section 2 refer to the influence of the characteristics of the companies going public on the amount of information provided in their prospectuses. In statistical terms, we test the influence of one or more variables (company characteristics) on another variable (the information provided). Company characteristics are the independent variables and the information provided is the dependent variable.

The analysis is performed by applying variance analysis techniques (ANOVA), linear and non-linear regressions, or even covariance analysis (ANCOVA). When the

No. of items	Categories	Mean	SD	Min.	Median	Max.
86	TOTAL-IS	29.36	6.09	17.00	28.50	40.00
86	TOTAL-IS (%)	34.14	7.08	19.77	33.14	46.51
29	IS-HC (%)	35.96	10.23	13.79	34.48	55.17
34	IS-SC (%)	30.62	10.31	14.71	32.35	52.94
23	IS-RC (%)	37.03	9.74	17.39	39.13	60.87

Notes: The table shows the basic descriptive statistics of dependent variables: total information supplied expressed as the total number of items and percentage, and subsequently details the information supplied by categories expressed as the percentage of the number of items supplied over the total amount of items in each category (total items per category is detailed in the column on the left). TOTAL IS is total items supplied on intellectual capital in general; IS-HC is total items supplied on human capital; IS-SC is total items supplied on structural capital; IS-RC is total items supplied on relational capital

Table III.
Descriptive statistics for the dependent variables

explanatory variables are nominal or ordinal, we use variance analysis; when they are interval variables (continuous variables), we use regression analysis; and when they are mixed categorical and continuous variables, covariance analysis is used.

4. Analysis and results

First, we will proceed with an initial analysis of the influence of each of the firm characteristics on the total IC information and the information provided by categories. In the second stage of the analysis, based on the variables selected in the first stage, we will analyse the influence of all the characteristics simultaneously to prove which one is influencing and develop a model.

4.1 First stage: individual analysis of the characteristics

The first analysis shows that high-tech companies provide more information on IC in general (26.39 items low-tech firms and 33.61 items high-tech firms). The influence of the sector is significant due to structural capital information, which is logical because we are talking about R&D or information technologies in high-tech firms (we do not show the numerical results of the ANOVA in this and following occasions to shorten the paper, but data are available upon request to the corresponding author).

According to the second analysis, the information provided in the prospectuses varies depending on the period of the IPO. In fact, there is a main difference between the oldest IPOs (before 1999) and the rest of them. The former supply significantly less information. However, the results achieved by the previous tests can be distorted, because it is possible that sector and period variables are related. To check this, we perform the χ^2 test between these two variables (dividing the sector into high- low-tech firms and the IPO period into pre- and post-1999 IPOs). See Table IV for the results of the χ^2 test.

The analysis clearly verifies that both variables are closely related, because before 1999, of the 17 IPOs analysed only two (11.8 per cent) are high-tech firms, while from 1999, of the 39 IPOs analysed 21 (53.8 per cent) are high-tech. Given this relationship, we will determine whether the effect on the information provided (the total information and the information by categories) is due to the sector or the period (see Table V). We propose some analyses of variance models with two attributes (sector and period). We found that the interactions between variables are not significant; therefore, we will show the results of the models without interaction.

Panel A: distribution of companies in sector and period

	Low-tech	High-tech	Total
Year < 1999	15	2	17
Year ⩾ 1999	18	21	39
Total	33	23	56

Panel B: test of independence

χ^2_{exp}	8.662
$p > \chi^2$	0.0032**

Notes: $n = 56$ firms. This table shows in Panel A how companies are distributed in sector and IPO periods and in Panel B the test of independency. Companies are divided in two sectors (high-tech and low-tech). IPO years are divided in two periods (before and after 1999). *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

Table IV.
Relationship between firm sector and IPO period

	Low-tech sector	High-tech sector	Total	ANOVA test – two attributes $F_{\exp}$	$p > F$
Panel A: total items supplied					
Year < 1999	25.07	27.50	25.71		
Year ⩾ 1999	30.50	33.90	30.95		
Total	26.39	33.61			
Year ⩾ 1999				2.8573	0.0968
Sector-high				18.7792	< 0.0001***
Panel B: information supplied – human capital					
Year < 1999	8.47	11.17	8.76		
Year ⩾ 1999	11.00	11.14	11.15		
Total	9.94	11.13			
Year ⩾ 1999				6.3821	0.0146*
Sector-high				0.2006	0.6561
Panel C: information supplied – structural capital					
Year < 1999	8.53	8.28	8.94		
Year ⩾ 1999	12.00	13.43	11.05		
Total	8.39	13.30			
Year ⩾ 1999				0.0041	0.9494
Sector-high				41.6313	< 0.0001***
Panel D: information supplied – relational capital					
Year < 1999	8.07	8.06	8.00		
Year ⩾ 1999	7.60	9.33	8.74		
Total	8.06	9.17			
Year ⩾ 1999				0.2176	0.6428
Sector-high				2.3228	0.1334

Table V.
Simultaneous influence of sector and IPO period in the information disclosed

Notes: $n = 56$ firms. This table shows the simultaneous influence of sector and IPO period in the information disclosed observing the mean of items supplied and its significativity through the ANOVA test. Panel A, B, C and D show the test for total information supplied, items about human capital, items about structural capital and items about relational capital, respectively. *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

As indicated in Table V, although at first we could accept that both sector and IPO period had a significant influence on the amount of IC items provided by the companies in their prospectuses, it is really only the sector which influences the total supplied information and the information on structural capital. However, it is the IPO period which influences the amount of items provided on HC.

Third, in order to test the influence of size on the amount of information disclosed we carry out several regression models for each of the variables (number of employees, sales and assets). The results indicate that variable asset has no significant relationship with the information provided (we do not show the results of the regression, but data are available upon request). However, the size, measured by employees and sales, has a positive and significant effect on the total IC information supplied, as well as on the items provided on HC and structural capital. Nonetheless, none of them influence the relational capital. The logarithm of the number of employees shows the greatest explanatory power: 18.56 per cent for the total information; 14.32 per cent for HC; and 14.75 per cent for structural capital.

After performing the regression using the naperian logarithm of employees, through an analysis of residuals, we detected a more complex non-linear relationship. Different

options were tested using higher degree polynomial functions for the employees logarithm (translogarithmic models), reaching as the ideal final result a cubic function of the log with no terms of first or second degree. This new option to measure the employees variable increases the explanatory power to 23.00 per cent for the total information, to 25.15 per cent for the HC, and reduces it to 13.90 per cent for the structural capital. To use a common approach, we will use the third power of logarithm of employees when measuring firm size through employees.

The three variables that measure the firm size in general (specifically employees and sales) are closely related (see correlations in Table II, Panels B and C). Hence, as it was done before with sector and IPO period, we will try to determine which of the two ways of measuring the size is really better influencing or explaining the amount of information supplied. We set out regression models with two explanatory variables (sales log and employees log to the third) and we will try to study which of them is a better predictor. See results in Table VI. Employees is clearly the variable, which has a significant influence on both variables: total IC information; and HC information. In fact, including sales does not improve the R^2 of these two models very much. However, in terms of structural capital, we cannot distinguish which of the two variables have more influence. The coefficient of each variable is not significant, although the model as a whole is significant. This effect is due to the high degree of multicollinearity between the two variables. So, in conclusion, we can say that among the variables used to measure the size, employees has the greatest influence in general, more specifically taking this variable as the third power of the employees logarithm. There is quite an interesting effect here, whereby very small businesses provide less information and very big firms provide much more information on IC, while among firms in the intermediate range there is no difference.

After performing the regressions between the information provided and the age of the company, there is no significant result. Contrary to the hypothesis, the age does not significantly influence the amount of information disclosed on IC (either in general terms or in any of the three categories), this result coincides with other studies such as Bukh *et al.* (2005).

	TOTAL IS	IS-HC	IS-SC	IS-RC
Intercept	29.1515	11.1170	7.8097	10.2248
	(3.3489)	(1.6056)	(2.0050)	(1.3813)
	***	***	***	***
Sales-Ln	0.0465	−0.1265	0.4960	−0.3230
	(0.6191)	(0.2968)	(0.3707)	(0.2554)
Empl-Ln^3	0.2716	0.1518	0.0790	0.0409
	(0.0888)	(0.0426)	(0.0531)	(0.0366)
	**	***		
R^2	23.01%	25.41%	16.71%	3.24%
F_{exp}	7.9214	9.0260	5.3181	0.8869
$p > F$	0.0010***	0.0004***	0.0079**	0.4180
SEReg	5.4421	2.6092	3.2582	2.2447
AIC	354.368	272.035	296.914	255.181

Notes: $n = 56$ firms. IS, items supplied; HC, human capital; SC, structural capital; RC, relational capital. Effect of firm size, measured as sales logarithm and the third power of logarithm of employees, on IC disclosure. *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

Table VI.
Effect of firm size on
the IC information
provided

Similarly, the regression models performed to test whether the previous shareholders' ownership retained after the IPO influences the amount of information on IC do not obtain significant results.

The limited sample size could be affecting the non-significant results, which have been obtained.

474

4.2 Second stage: analysis of the characteristics simultaneously

At this stage, we proceed to apply all the variables together to determine which of them have a real influence and acts as a better predictor. First, we establish the initial models, based on the results of individual tests, which will be subsequently corrected and completed. Table VII shows the initial models explaining the information provided on IC (TOTAL IS), HC (IS-HC) and structural capital (IS-SC), where every input variable remains significant. There is no model for relational capital, because there was no significant variable.

We studied the possibility of including the interaction effect among the explanatory variables of models in Table VII. However, none of them have significantly improved the models. On the other hand, we must take into account that some of the variables, which were excluded from the initial model because they did not have any significant influence individually on the information supplied, may become significant when they are combined in a model with several variables. It is appropriate, therefore, to examine the inclusion of other variables (such as: asset, age, former shareholders, etc.).

In the structural capital information model, this process does not produce any change. But in models for total IC information (TOTAL IS) and for HC information (IS-HC) it seems appropriate to include the variable of previous shareholders' ownership held after the IPO, measuring it as a dichotomous variable where

	TOTAL IS	IS-HC	IS-SC
Intercept	26.8298 (0.7910) ***	9.1679 (0.6082) ***	8.5519 (0.4287) ***
Sector	6.2286 (1.2499) ***		4.5530 (4.5530) ***
Year $\geqslant$ 1999		1.8363 (0.7321) *	
Employees-Ln^3	0.2121 (0.0586) ***	0.1248 (0.0321) ***	0.0769 (0.0318) *
R^2	47.57%	33.09%	53.52%
F_{exp}	24.04	13.1075	30.5089
$p > F$	< 0.0001***	< 0.0001***	< 0.0001***
SEReg	4.4910	2.4341	2.4341
AIC	332.855	265.945	264.2561

Notes: $n = 56$ firms. IS, items supplied; HC, human capital; SC, structural capital; Sector, Scores 1 when it is a high-tech company, otherwise 0; year $\geqslant$1999, Scores 1 when the IPO was in 1999 or after, otherwise 0; Employees-Ln^3, third power of logarithm of employees. This table shows the initial model explaining the global intellectual capital information, information on human capital and on structural capital. *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

Table VII.
Initial models

shareholders hold the majority after the IPO (Value 1) or not (Value 0), which negatively influences the total information supplied. This new coefficient is significant and improves the models. Thanks to this new variable, R^2 rises up to 53.97 per cent for global IC information and up to 39.44 per cent for HC information. In both cases, Akaike criterion improves.

Finally, we test the introduction of interaction effects among the variables of the new model, but they are not significant. Final models are shown in Table VIII.

We have also performed residual diagnostics, including, for example, White's heteroskedasticity test, the Jarque-Bera normality test and various influential observation tests have not detected any problem of heteroskedasticity, lack of normality or influential observations. Nevertheless, due to the small size of the sample and in order to avoid the problems of the ordinary least squares method, we have estimated the three final models using robust least squares through the MM-estimation method. The results do not differ from those observed in Table VIII.

5. Discussion and conclusions

The results of the analyses corroborate the *H1* in the expected way; high-tech companies give more information on IC. These firms carry out a larger investment in R&D or are based on information technologies, so they are able to mention more items and they tend to do so. Significant results were obtained in the same sense in the Danish (Bukh *et al.*, 2005), Japanese (Rimmel *et al.*, 2009) and the British (Mangena *et al.*, 2010)

	TOTAL IS	IS-HC	IS-SC
Intercept	30.7437 (1.6364) ***	11.0958 (1.0117) ***	8.5519 (0.4287) ***
Sector	7.1732 (1.2334) ***		4.5530 (0.6775) ***
Year $\geqslant$ 1999		1.9464 (0.7048) **	
Employees-Ln^3	0.2331 (0.0560) ***	0.1382 (0.0313) ***	0.07688 (0.0317) *
Previous shareholders $> 50\%$	-4.9128 (1.8268) **	-2.2887 (0.9806) *	
R^2	53.97%	39.44%	53.52%
$F_{\exp}$	20.3251	11.2874	30.5089
$p > F$	< 0.0001***	< 0.0001***	< 0.0001***
SEReg	4.2482	2.3735	2.4341
AIC	327.978	262.781	264.256

Notes: $n = 56$ firms. Sector, Scores 1 when it is a high-tech company, otherwise 0; year $\geqslant$ 1999, Scores 1 when the IPO was in 1999 or after, otherwise 0; employees-Ln^3, third power of logarithm of employees; previous shareholders > 50 per cent, Scores 1 when previous shareholders retain more than 50 per cent of shares, otherwise 0. This table shows the final models explaining the total intellectual capital information, the information about human capital and about structural capital. *,**,***Significant at the 5 and 1 per cent and 1 per thousand levels, respectively

Table VIII.
Final models

financial markets. However, Cordazzo (2007) obtained no significant results after testing the *H1* in Italian IPOs, which seems to be abnormal in the literature, as we have proved here. We state that knowledge-based companies will need to supply more information in order to reduce the information asymmetry according to the agency theory.

There are differences in the information provided on HC, structural capital and IC in general. The latter is influenced not only by the sector but also by the size of the company (measured by number of employees) and by the fact that former shareholders retain more than 50 per cent of the shares after the IPO. The employees variable suggests that as the number of employees increases, the number of items provided in the prospectus also increases, to a point where the information provided is stagnant, but it increases again in the largest companies. In the three cases (IC, HC and SC), the most important difference is between the very small businesses (providing less information) and the very large firms, which provide more information, and there is less difference among firms in the intermediate range (as it is a cubic function). Therefore, we can corroborate the *H4*. This hypothesis is also significant in studies such as Cordazzo (2007) and Bozzolan *et al.* (2003) for Italy, and Mangena *et al.* (2010) for the UK. However, neither in Bukh *et al.* (2005) for Denmark, nor in Rimmel *et al.* (2009) for Japan are there any significant results. We must consider the variable used to measure the size of the company. In the case of Italy, it was measured using sales, and in the UK, using the market capitalization. When talking about IC, it makes sense to measure the size of the company in terms of employees, rather than using sales, assets or other kinds of measurements, because an increasing number of employees will make it necessary to standardize internal processes and better human resource policies. This paper has positive results using the number of employees, in contrast to the Danish and Japanese cases where this variable was not significant, maybe due to the effect of the cubic function. Very big companies feel more pressure to disclose information in order to be legitimated by society, due to the fact that they are affecting more people, not only their employees, but also through tax contribution or the effect on local societies if they close.

According to the *H3*, when previous shareholders are not going to keep more than 50 per cent of the shares after the IPO, firms provide more information; that is, when companies want to attract more capital, they provide more information. Guo *et al.* (2004) confirmed this hypothesis and we can conclude that firms going public try to avoid the negative signalling effect caused by a low-retained ownership, by disclosing additional non-financial information.

This research, based on a rigorous methodology, provides some new results and contributions to the literature. First, the paper verifies three of the four theories for IC disclosure (An *et al.*, 2011), the agency theory, signalling theory and legitimacy theory. Companies are willing to provide more information, apart from financial statements, in order to decrease the agency problem, to solve the negative signalling effects and to be legitimated by society through a successful IPO process. Second, we establish a new non-linear relationship between firm size (measured by number of employees) and the information provided, so that companies in the extremes (those with very few employees or many employees) are those that really differ when disclosing less or more information on IC, respectively. Third, there are few studies that have used the variable of retained ownership after the IPO when studying the IC information. In this work, we have achieved a significant result, which confirms the hypothesis, strengthens and generalizes the results obtained in this respect by Guo *et al.* (2004) for the biotechnology

firms. Fourth, this is the first study of these characteristics in the Spanish market, with a database created *ad hoc*, which is a reference for other mid-sized markets such as many Latin American ones. Finally, none of the variables studied influences relational capital, that is, all kinds of businesses, regardless of the sector, size, age, etc. provide the same information about this type of capital. There is a great implication for organizations, because it seems that nowadays, regardless of the type of company or its IPO characteristics, all firms provide the same type of information related to external stakeholders. Therefore, this could be the way to obtain differentiation, whereby they can improve their non-financial information.

As an additional result, we have to accept that age has no influence, contrary to *H2* and that the period affects only HC information; thus, the stakeholder theory is partially corroborated.

Once we know how different firm characteristics affect the IC disclosure, the next step for future research should be to study the implications of information in the IPO performance, observing the degree in which firms supplying more IC items, achieve a higher offer price. Moreover, in recent months in Spain, the IPO process has been reactivated due to the economic recovery. In a few years, we will be able to compare the results of this study with the post-crisis period [1], expecting an increase of IC disclosure.

Finally, we think that our results can be extended to other markets, especially to the Latin American ones, where no studies on IC disclosure in IPOs have been undertaken. The legal and cultural similarities of Ibero-American regions justify this idea.

Note

1. Doing this would enable us to test the sample to check the validity of the results obtained in this study.

References

Aggarwal, R., Leal, R. and Hernandez, L. (1993), "The aftermarket performance of initial public offerings in Latin America", *Financial Management*, Vol. 22 No. 1, pp. 42-53.

Ahmed, K. and Courtis, J.K. (1999), "Association between corporate characteristics and disclosure levels in annual reports: a meta-analysis", *The British Accounting Review*, Vol. 31 No. 1, pp. 35-61.

An, Y., Davey, H. and Eggleton, I.R.C. (2011), "Towards a comprehensive theoretical framework for voluntary disclosure", *Journal of Intellectual Capital*, Vol. 12 No. 4, pp. 571-585.

Balatbat, M. (2006), "Discussion of explaining the short- and long-term IPO anomalies in the US by R&D", *Journal of Business Finance & Accounting*, Vol. 33 Nos 3/4, pp. 580-586.

Barrick, M.R., Thurgood, G.R., Smith, T.A. and Courtright, S.H. (2015), "Collective organizational engagement: linking motivational antecedents, strategic implementation, and firm performance", *Academy of Management Journal*, Vol. 58 No. 1, pp. 111-135.

Beyer, A., Cohen, D.A., Lys, T.Z. and Walther, B.R. (2010), "The financial reporting environment: review of the recent literature", *Journal of Accounting and Economics*, Vol. 50 Nos 2/3, pp. 296-343.

Boedker, C., Guthrie, J. and Cuganesan, S. (2005), "An integrated framework for visualising intellectual capital", *Journal of Intellectual Capital*, Vol. 6 No. 4, pp. 510-527.

Bozzolan, S., Favotto, F. and Ricceri, F. (2003), "Italian annual intellectual capital disclosure. An empirical analysis", *Journal of Intellectual Capital*, Vol. 4 No. 4, pp. 543-558.

Bozzolan, S., O'Regan, P. and Ricceri, F. (2006), "Intellectual capital disclosure (ICD): a comparison of Italy and the UK", *Journal of Human Resource Costing & Accounting*, Vol. 10 No. 2, pp. 92-113.

Brown, N. and Deegan, C. (1998), "The public disclosure of environmental performance information – a dual test of media agenda setting theory and legitimacy theory", *Accounting and Business Research*, Vol. 29 No. 1, pp. 21-41.

Bukh, P.N., Nielsen, C., Gormsen, P. and Mouritsen, J. (2005), "Disclosure of information on intellectual capital in Danish IPO prospectuses", *Accounting, Auditing & Accountability Journal*, Vol. 18 No. 6, pp. 713-732.

Cazavan-Jeny, A. and Jeanjean, T. (2007), "Levels of voluntary disclosure in IPO prospectuses: an empirical analysis", *Review of Accounting and Finance*, Vol. 6 No. 2, pp. 131-149.

Chavent, M., Ding, Y., Fu, L., Stolowy, H. and Wang, H. (2006), "Disclosure and determinants studies: an extension using the Divisive Clustering Method (DIV)", *European Accounting Review*, Vol. 15 No. 2, pp. 181-218.

Chen, M.C., Cheng, S.J. and Hwang, Y. (2005), "An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance", *Journal of Intellectual Capital*, Vol. 6 No. 2, pp. 159-176.

Cordazzo, M. (2007), "Intangibles and Italian IPO prospectuses: a disclosure analysis", *Journal of Intellectual Capital*, Vol. 8 No. 2, pp. 288-305.

Cumby, J. and Conrod, J. (2001), "Non-financial performance measures in the Canadian biotechnology industry", *Journal of Intellectual Capital*, Vol. 2 No. 3, pp. 261-272.

Dambra, M., Xasares, L. and Gustafson, M.T. (2015), "The JOBS Act and IPO volume: evidence that disclosure costs affect the IPO decision", *Journal of Financial Economics*, Vol. 116 No. 1, pp. 121-143.

Doidge, C., Karolyi, G.A. and Stulz, R.M. (2013), "The US left behind? Financial globalization and the rise of IPOs outside the US", *Journal of Financial Economics*, Vol. 110 No. 3, pp. 546-573.

Edvinsson, L. and Malone, M.S. (1997), *Intellectual Capital. The Proven way to Establish Your Company's Real Value by Measuring its Hidden Brainpower*, Judy Piatkus (Publishers) Limited, London.

Freeman, R.E. (1994), "Stakeholder theory", *Business Ethics Quarterly*, Vol. 4 No. 4, pp. 409-421.

García-Meca, E. and Martínez, I. (2007), "The use of intellectual capital information in investment decisions. An empirical study using analyst reports", *The International Journal of Accounting*, Vol. 42 No. 1, pp. 57-81.

Gregoire, J. and Castillo, R. (2009), "Factors in IPO underpricing, Chile 1993-2006", *Multidisciplinary Business Review*, Vol. 2 No. 1, pp. 36-46.

Guo, R.-J., Lev, B. and Shi, C. (2006), "Explaining the short- and long-term IPO anomalies in the US by R&D", *Journal of Business Finance & Accounting*, Vol. 33 Nos 3/4, pp. 550-579.

Guo, R.-J., Lev, B. and Zhou, N. (2004), "Competitive costs of disclosure by Biotech IPOs", *Journal of Accounting Research*, Vol. 42 No. 2, pp. 319-355.

Guthrie, J. and Petty, R. (2000), "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1 No. 3, pp. 241-251.

Hensler, D.A., Herrera, M.J. and Lockwood, L.J. (2000), "The performance of initial public offerings in the Mexican stock market, 1987-1993", *Journal of International Money and Finance*, Vol. 19 No. 1, pp. 93-116.

Holland, J. (2003), "Intellectual capital and the capital market – organisation and competence", *Accounting, Auditing & Accountability Journal*, Vol. 16 No. 1, pp. 39-48.

Hsu, J., Young, W. and Wang, H.Y. (2012), "Pre-IPO acquirers' issuance cost and long-run performance: do their M&A disclosures matter?", *Journal of Business Finance and Accounting*, Vol. 39 Nos 1/2, pp. 141-164.

International Integrated Reporting Council (2013), "The international < IR > framework", available at: www.theiirc.org/international-ir-framework/ (accessed 15 June 2015).

Ireland, R.D., Hitt, M.A. and Vaidyanath, D. (2002), "Alliance management as a source of competitive advantage", *Journal of Management*, Vol. 28 No. 3, pp. 413-446.

Jara Bertín, M. and Arias Moya, J.T. (2013), "The effect of mandatory IFRS adoption on accounting conservatism of reported earnings. Evidence from Chilean firms", *Academia Revista Latinoamericana de Administración*, Vol. 26 No. 1, pp. 139-169.

Jardon, C.M. and Martos, M.S. (2012), "Intellectual capital as competitive advantage in emerging clusters in Latin America", *Journal of Intellectual Capital*, Vol. 13 No. 4, pp. 462-481.

Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360.

Kamukama, N., Ahiauzu, A. and Ntayi, J.M. (2011), "Competitive advantage: mediator of intellectual capital performance", *Journal of Intellectual Capital*, Vol. 12 No. 1, pp. 152-164.

Kaplan, R.S. and Norton, D.P. (1996), *The Balanced Scorecard: Translating Strategy Into Action*, Harvard Business School Press, Boston, MA.

Kaplan, R.S. and Norton, D.P. (2008), *The Execution Premium: Linking Strategy to Operations for Competitive Advantage*, Harvard Business School Press, Boston, MA.

Kent, P. and Zunker, T. (2013), "Attaining legitimacy by employee information in annual reports", *Accounting, Auditing and Accountability Journal*, Vol. 26 No. 7, pp. 1072-1106.

Kim, M. and Ritter, J.R. (1999), "Valuing IPOs", *Journal of Financial Economics*, Vol. 53 No. 3, pp. 409-437.

Leland, H.E. and Pyle, D.H. (1977), "Informational asymmetries, financial structure and financial intermediation", *The Journal of Finance*, Vol. 32 No. 2, pp. 371-387.

Lev, B. (2001), *Intangibles – Management, Measurement and Reporting*, The Brooking Institution, Washington, DC.

Lowry, M., Officer, M.S. and Schwert, G.W. (2010), "The variability of IPO initial returns", *The Journal of Finance*, Vol. 65 No. 2, pp. 425-465.

Mangena, M., Pike, R. and Li, J. (2010), *Intellectual Capital Disclosure Practices and Effects on the Cost of Equity Capital: UK Evidence*, The Institute of Chartered Accountants of Scotland, Edinburgh.

Marr, B. (2005), *Perspectives on Intellectual Capital*, Elsevier Inc., Oxford.

Martín-de-Castro, G., Delgado-Verde, M., López-Sáez, P. and Navas-López, J.E. (2011), "Towards 'an intellectual capital-based view of the firm': origins and nature", *Journal of Business Ethics*, Vol. 98 No. 4, pp. 649-662.

Martínez-Ferrero, J. (2014), "Consequences of financial reporting quality on corporate performance. Evidence at the international level", *Estudios de Economía*, Vol. 41 No. 1, pp. 49-88.

Mention, A. and Bontis, N. (2013), "Intellectual capital and performance within the banking sector of Luxembourg and Belgium", *Journal of Intellectual Capital*, Vol. 14 No. 2, pp. 286-309.

Nakamura, L. (2003), "A trillion dollars a year in intangible investment and the new economy", in Hand, J. and Lev, B. (Eds), *Intangible Assets: Values, Measures and Risks*, Oxford University Press, Oxford, pp. 19-47.

OECD (1996), *The Knowledge-Based Economy*, Organisation for Economic Cooperation and Development, Paris.

Patel, S.A. and Dallas, G. (2002), *Transparency and Disclosure: Overview of Methodology and Study Results – United States*, Standard and Poor's, New York, NY.

Rashid, A.A., Ibrahim, M.K., Othman, R. and See, K.F. (2012), "IC disclosures in IPO prospectuses: evidence from Malaysia", *Journal of Intellectual Capital*, Vol. 13 No. 1, pp. 57-80.

Riahi-Belkaoui, A. (2003), "Intellectual capital and firm performance of US multinational firms. A study of the resource-based and stakeholder views", *Journal of Intellectual Capital*, Vol. 4 No. 2, pp. 215-226.

Rimmel, G., Nielsen, C. and Yosano, T. (2009), "Intellectual capital disclosures in Japanese IPO prospectuses", *Journal of Human Resource Costing & Accounting*, Vol. 13 No. 4, pp. 316-337.

Ross, S.A. (1977), "The determination of financial structure: the incentive-signalling approach", *Bell Journal of Economics*, Vol. 8 No. 1, pp. 23-40.

Rossoni, L. and Machado-da-Silva, C.L. (2013), "Legitimidade, governança corporativa e desempenho: análise das empresas da MB&F Bovespa", *Revista de Administraçao de Empresas*, Vol. 53 No. 4, pp. 350-362.

Sanz, L. and Jones, V. (2013), "Advances in business research in Latin American studies", *Journal of Business Research*, Vol. 66 No. 3, pp. 397-400.

Shakina, E. and Barajas, A. (2014), "Value creation through intelectual capital in developed European markets", *Journal of Economic Studies*, Vol. 41 No. 2, pp. 272-291.

Singh, I. and Van der Zahn, J.-L.W.M. (2008), "Determinants of intellectual capital disclosure in prospectuses of initial public offerings", *Accounting and Business Research*, Vol. 38 No. 5, pp. 409-431.

Watts, R.L. and Zimmerman, J.L. (1986), *Positive Accounting Theory*, Prentice Hall, Englewood Cliffs, NJ.

Appendix 1. Variables

d_i: equals 1 when the firm mentions item i in the IPO prospectus and 0 when the firm does not mention it.

IS DISC (per cent): percentage of the number of items supplied in the IPO prospectus over the total number of items available.
Source: own elaboration from IPO prospectuses.

M: number of companies in the sample.

TOTAL IS: total number of items supplied in the IPO prospectus.
Source: own elaboration from IPO prospectuses.

Appendix 2

Items by categories	% firms including them	Items by categories	% firms including them
Human capital (29 items)	*35.96*	Management experience (named individual)	85.7
Staff breakdown by age	35.7	Number of employees	100
Staff breakdown by seniority	12.5	*Structural capital (34 items)*	*30.62*
Staff breakdown by gender	8.9	Description and reason for investments in IT	51.8
Staff breakdown by geographical area	33.9	IT systems	19.6
Staff breakdown by department	48.2	Software assets	32.1
Staff breakdown by job function	30.4	Description of IT facilities	17.9
Staff breakdown by level of education	19.6	IT expenses	35.7
Staff breakdown by professional category	73.2	Information and communication within the company	3.6
Rate of staff turnover	12.5	Efforts related to the working environment	1.8
Comments on changes in number of employees	51.8	Working from home	0
Staff health and safety	14.3	Internal sharing of knowledge and information	26.8
Absence/leave	7.1	Measure of internal or external failures	60.7
Staff interview	0	Fringe benefits and company social programmes	1.8
Statements of policy on competence development	41.1	Environmental approvals and statement/policies	50
Description of competence development programme and activities	17.9	Statements of policy, strategy and/or objectives of R&D activities	66.1
Education and training expenses	21.4	R&D expenses	35.7
Education and training expenses/number of employees	0	R&D expenses/sales	12.5
Employee expenses/number of employees	12.5	R&D invested in basic research	0
Recruitment policies	71.4	R&D invested in product design/development	5.4
HRM department, division or function	8.9	Future prospects regarding R&D	28.6
Job rotation opportunities	7.1	Details of company patents	16.1
Remuneration and incentive systems	92.9	Number of patents and licenses, etc.	26.8
Pensions	83.9	Patents pending	7.1
Insurance policies	78.6	Strategic alliances	35.7
Statements of dependence on key personnel	57.1	Objectives and reason for strategic alliances	21.4
Revenues/employee	16.1	Comments on the effects of the strategic alliances	8.9
Value added/employee	0		

Table AI.
Intellectual capital
items divided by
categories

Table AI.

Items by categories	% firms including them	Items by categories	% firms including them
Organizational structure	94.6	Description of community involvement	23.2
Description of new production technology	8.9	Information on corporate social responsibility and objective	12.5
Statements of corporate quality performance	0	Number of customers	14.3
Corporate culture statements	8.9	Sales breakdown by customer	26.8
Best practice	85.7	Annual sales per segment or product	92.9
Utilization of energy, raw materials and other input goods	53.6	Average customer size	51.8
Description of employee contracts/contractual issues	3.6	Dependence on key customers	64.3
Products in market	100	Description of customer involvement	62.5
Products in development	50	Description of customer relations	44.6
Product development timeline	69.6	Education/training of customers	7.1
Relational capital (23 items)	*37.03*	Customers/employees	1.8
External sharing of knowledge and information	26.8	Value added per customer or segment	3.6
Description of the network of suppliers and distributors	94.6	Market share (%)	50
Statements of image and brand	87.5	Relative market share	41.1
Awards	19.6	Market share, breakdown by country/segment/product	28.6
Received subsidies	30.4	Repurchase	12.5
Investment in the environment	37.5	Customer satisfaction	17.9

Sources: Own elaboration based on Bukh *et al.* (2005) and Cumby and Conrod (2001)

About the authors
Leire Alcaniz holds an MBA and a PhD in Business Administration from the University of Deusto. She is an Associate Professor of Financial Accounting at the Deusto Business School and her publications mainly focus on intellectual capital; specifically, intangible assets accounting, intellectual capital reporting and initial public offerings. She belongs to the finance research team in the University of Deusto. Leire Alcaniz is the corresponding author and can be contacted at: leire.alcaniz@deusto.es

Professor Fernando Gomez-Bezares has a MBA and a PhD in Economics and Business from the University of Deusto and he was invested Doctor Honoris Causa by the El Salvador University (Buenos Aires, Argentina). He is currently a Professor of Finance at the Deusto Business School. He is also a Visiting Professor in other European and American universities. His publications are mainly on corporate finance, efficiency and valuation and asset management (mainly measuring its performance), topics in which he has also worked professionally. He belongs to the finance research team, of which he is the main researcher, in the University of Deusto.

Professor Jose Vicente Ugarte holds a PhD in Economics and Business from the University of Deusto. He is currently a Professor of Mathematics and Econometrics at the Deusto Business School. His research is focused on mathematics, econometrics, etc., and their empirical application in Business Research. He belongs to the Finance Research Team in the University of Deusto.