



# Information disclosed online by Spanish universities: content and explanatory factors

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## Abstract

**Purpose** – The purpose of this paper is to analyse how several variables, such as universities' profitability, growth-reduction of student numbers, age/tradition, type of university and internationality, among others, influence the transparency practices of Spanish universities as well as the technology, interactivity, structure and navigability of their webpages.

**Design/methodology/approach** – First a content analysis of the Spanish universities' websites is carried out. To do this a disclosure index is created and applied. This index is more complex than those in previous papers, focusing on several issues, such as financial information, corporate governance, social responsibility, research, teaching activities, strategic information, timeliness, contact information, technology, interactivity with users, navigability and web structure. Then an empirical model is estimated by applying a linear regression, taking several factors into consideration.

**Findings** – Three of the independent variables proposed to test the hypotheses – complexity, internationality and profitability – were statistically significant. Moreover, our findings emphasise prioritising use of the internet as a way to disclose teaching and research activities, as well as to monitor university bodies.

**Originality/value** – The most valuable output from this paper has to do with the content of the information disclosed online by Spanish universities and with the analysis of the factors that explain the disclosure of information through Spanish universities' websites.

**Keywords** Internet, Webpages, Universities, Explanatory factors, Information disclosure, Spain

**Paper type** Research paper

## Introduction

The increase in global information required from universities nowadays may have its origin in the international globalisation process, which requires universities to become management units in search of new means of financing and interacting with public and private agents. The convergence programme derived from the Bologna Declaration in Europe has also doubtlessly influenced this process. Hence, in an increasingly competitive environment, higher education institutions should be concerned about their institution's positioning and image (Ivy, 2001, p. 276), and need to maintain or develop a distinct image to create a competitive advantage (Paramewaran and Glowacka, 1995).

The Spanish University Law (*Boletín Oficial del Estado*, 2007, p. 16241) establishes that "there exists a need to improve the quality of university systems, through a culture of evaluation of university services", within the context of a full integration of the Spanish higher education system into the European Higher Education Area. Murias *et al.* (2008) suggest two main reasons for this:



- (1) the increase in competition among universities in order to recruit students; and
- (2) the new dynamism in the financing of these institutions.

The National Agency for Quality Evaluation and Accreditation (2008) also underlines the importance of disclosing information online in order to achieve quality certifications (particularly in doctoral studies). The National Agency for Quality Evaluation and Accreditation (ANECA) is the public agency which evaluates the quality of universities in Spain.

These information requirements, both those imposed by law and those derived from an increase in demand by stakeholders, justify the need to examine the disclosure of information by Spanish universities, including digital information. In this vein providing electronic information implies the use of information technologies to simplify the interactions between universities and those demanding information. Together with the advantages deriving from internet usage, there is a greater scope of information distribution and consequently a larger audience for the information revealed.

Recently most studies on the disclosure of information in universities have focused on surveys and interviews such as, for instance, Pettersen and Solstad (2007) for Norwegian universities, Fischer *et al.* (2004) and Gordon *et al.* (2002) for universities in the USA, Angluin and Scapens (2000) for universities in the UK, and Nelson *et al.* (2003) for Canadian universities.

However disclosure on the internet has not been as well researched as other ways universities have for revealing information, so that few studies have used an institutional website as the means for assessing information disclosure. The internet provides a potential disclosure mechanism that has many advantages (for instance the public can access the information quickly and easily). In this sense Buenadicha *et al.* (2001) and Olsina *et al.* (2001) have analysed issues of accessibility, speed and navigability in Spanish university websites from a descriptive perspective.

In this work we focus on the information provided by Spanish universities on their websites, taking into consideration different types of information that can also be disclosed on the internet, such as financial information, the universities' efforts in sustainability, corporate governance bodies, social responsibility, technology, web structure, etc. At the same time this study analyses how several variables – such as size, leverage, universities' profitability, growth-reduction of student numbers, age/tradition, type of university, internationality, etc. – can influence this disclosure.

Therefore we add to the previous literature by studying the degree of utilisation of websites by Spanish universities in order to achieve transparency and by analysing which factors influence the achievement of greater transparency in online disclosure. In contrast to previous papers we have considered the overall disclosure information available online, such as financial information, corporate governance, social responsibility, research, teaching activities, strategic information, timeliness, contact information, technology, interactivity with users, navigability and web structure. This approach is quite different from the latest studies such as that of Gallego *et al.* (2009), who only analysed the financial information (e.g. overall annual accounts, overall university budget, external auditing report, account court report, and other financial items).

More specifically we tested a dependence model in which the previous disclosure index is regressed on several variables – such as universities' profitability,

growth-reduction of student numbers, age/tradition, type of university, internationality, etc. – by taking into account the whole population of Spanish universities.

This work is structured as follows. In the next section several factors that influence the disclosure of information by universities are described, and the research hypotheses are stated. The subsequent section explains the methods used to test the hypotheses, especially the disclosure index and the estimated model. Finally we present our findings, summary and conclusions.

### **Factors behind the disclosure of information online by universities**

In universities' disclosure of information, several factors that have been analysed in previous studies on public institutions can act as relevant drivers, such as institution size, leverage, university profitability, governance, internationality, complexity and age.

#### *Institution size*

Organisational size has been one of the variables most used in order to explain the disclosure of information. In the business context, and according to Giner (1995), one of the main reasons justifying the disclosure of corporate information is the need to keep adequate links with capital suppliers, in order to obtain financing under the best conditions.

From the perspective of a cost-benefit analysis the costs of preparing and disseminating information on the internet are likely to be unrelated to corporate size (Larrán and Giner, 2002; Bonsón and Escobar, 2004). Nevertheless the potential benefits will be greater for larger-sized corporations, since there is a direct relationship between agency costs and disclosure benefits, as well as other aspects. From the agency theory perspective the disclosure of corporate information diminishes the agency costs that stem from the conflicts of interest between managers and shareholders, and between managers and debtors. Thus the information that is provided can be useful for owners and managers in the decision-making process, and it can work as a system for control by shareholders and other stakeholders over managerial activities.

Taking into account these arguments most previous research has found that corporate size has a positive influence on the amount of voluntary information disclosed on websites (Craven and Marston, 1999; Oyelere *et al.*, 2003; Marston and Polei, 2004; Bonsón and Escobar, 2004; Lim *et al.*, 2007; Boesso and Kumar, 2007; Gallego-Álvarez *et al.*, 2008) and on webpage navigability (Bonsón-Ponte *et al.*, 2008). However some other studies have found exceptions to the direct relationship by showing its validity only up to a certain level of size, which would exclude listed companies in Germany (Pirchegger and Wagenhofer, 1999, p. 392). Several works, such as those of Khanna *et al.* (2004) and Ortiz and Clavel (2006), did not find a statistically significant relationship for European multinationals listed on the NYSE.

Within the public sector size was found not to be a predictor of internet financial reporting amongst local, regional and national authorities (Baber, 1983; Evans and Patton, 1987; Christiaens, 1999; Laswad *et al.*, 2005), although previous studies had found a positive association (Chow and Wong-Boren, 1987). In universities, Gordon *et al.* (2002) found that size is significant in explaining the total extent of disclosure.

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Therefore, taking into account the different positions and the theoretical arguments, we have established the following hypothesis:

- H1.* Large universities disclose a greater amount of information on their websites compared to smaller universities.

Many previous studies have used total assets, sales and market capitalisation to measure corporate size. As Gordon *et al.* (2002) argue, market capitalisation is not a measurable value for universities. In universities, an appropriate measure of size could be the number of students, and that will be used in this study.

#### *Leverage*

The level of leverage constitutes another factor associated with a larger amount of disclosed information from the agency theory perspective (also employed to argue and develop *H1* regarding size), especially as a result of conflicts stemming from the leverage. In this sense companies with more debt have greater agency costs because there is a possibility of transference of wealth from debtors to stockholders. By increasing the amount of information disclosed, corporations can reduce their agency costs and any possible conflicts of interest between owners and creditors. In this respect, by analysing the influence of agency theory, several studies have found a positive effect of leverage on the amount of information revealed voluntarily (e.g. Giner *et al.*, 2003; Xiao *et al.*, 2004; Prencipe, 2004), whereas other works did not find a statistically significant relationship (Giner, 1997; Oyelere *et al.*, 2003; Gul and Leung, 2004).

Within the public sector “the use of debt to finance public activities provides an incentive for political managers to reduce the cost of debt” (Zimmerman, 1977, p. 134). This can be achieved by disclosing information that facilitates monitoring by creditors. Laswad *et al.* (2005) found a positive association between leverage and the voluntary use of internet financial reporting by local government authorities. In the case of universities, in many European countries they obtain funds from government subventions (endowments or subsidies); in addition they use debt to undertake specific investments and adhere to budget requirements, beyond the public one. The use of large quantities of debt limits the future possibilities of obtaining new funds, and involves high interest costs as expenses, reducing the possibility of making new investments. The way current governance manages budgets and debt can involve future repercussions for universities and their financial condition. In this context Gordon *et al.* (2002) conclude that leverage as measured by a debt to equity ratio was not associated with a higher level of disclosure.

According to the previous arguments mainly for the business context the following hypothesis has been established:

- H2.* Universities with higher leverage disclose a greater volume of information on their websites compared to low-leveraged universities.

#### *University profitability*

The link between profitability and disclosure is especially complex. The main disclosure theories tend to indicate that there is a positive relationship. In accordance with the agency theory for the business context, the managers of profitable companies use information to obtain personal advantages, such as ensuring the stability of their positions and increasing their levels of compensation.

From the perspective of the signalling theory, profitability can be considered an indicator of the quality of the investment. Therefore, if a high level of profitability is achieved, there will be a greater incentive to disclose information and reduce the risk of being viewed negatively by public opinion. In addition the political costs theory supports the disclosure of voluntary information, so as to justify the returns and public funds obtained.

Economic wealth or profitability in institutions has been frequently used in previous studies of the public sector. Christiaens (1999) and Laswad *et al.* (2005) argue a positive link with an increase in the disclosure of information for municipalities because it implies a signal of management quality as well as the interests of stakeholders. In the same way, the largest and most profitable universities are more visible and more highly scrutinised, so they are more pressured to reveal information.

Consequently the following hypothesis has been formulated:

*H3.* The more profitable universities will disclose a larger level of information on their websites compared to less profitable universities.

#### *Governance*

Another variable that should be considered in order to evaluate the information revealed by universities online is the size and composition of their management bodies, which usually comprise the president or vice-chancellor and their team. This team may be formed by people of different nationalities, gender and experience, which will enrich the team in their decision-making. Along this line Ingram (1998, p. 12) recommends that “the boards should be increased to facilitate improved trusteeship”, on the basis of Moisan’s (1992, p. 10) idea, “that the general effectiveness of a board was influenced by its size”. A more effective board may in turn be more prone to disclosing information about the success of its management.

According to theoretical arguments we have formulated the following hypothesis:

*H4.* Universities with more members in their management bodies disclose more information on their websites than universities with fewer members.

#### *Internationality of the university*

Currently the importance of internationality within universities is particularly emphasised. According to Gumpert and Sporn (1999, p. 103) the recent global, competitive environmental forces have created unprecedented challenges for universities, so that the borders of universities have opened in new ways for their services and products. Cross-border education (that is, internationalisation), with the consequent requirements for structural and cultural adaptations, is pervasive and an inescapable reality on a worldwide basis.

Both in America and in Europe there is a clear call for internationalisation. For example, the American Council on Education’s Commission on International Education (1995) states that higher education institutions must become – in a genuine sense – institutions without boundaries if the nations and their people are to prosper in the environment of the new century. In Europe the need to internationalise has led to the implementation of the ERASMUS, CAMETT and TEMPUS programmes, for example, and high priority has been given to academic international mobility of students and faculty (Sporn, 1999).

In the current context of increasing competition worldwide, Opoku *et al.* (2008, 2009) highlight the growing importance of image positioning issues in the internationalisation of higher education institutions. Higher education institutions need to maintain or develop a distinct image to create a competitive advantage in an increasingly competitive market (Paramewaran and Glowacka, 1995; Ivy, 2001). Hence, a higher level of information should be disclosed by universities in order to recruit more foreign students, for whom universities' websites will be the main source of knowledge about the universities' activities, services and financial condition. Websites will become a relevant tool for disclosing activities and for promoting the university internationally and can be used to make universities more known abroad, by disclosing the courses offered, the facilities available, the faculty and other issues that can be useful for interested people. Both in the case of universities that have an international image that they would like to maintain and universities that are attempting to reach an international audience, websites can be especially relevant. In this regard international universities are also more likely to have websites in different languages, which can facilitate the spreading and disclosure of more information.

Consequently we test the following hypothesis:

- H5.* More international universities disclose more information on their websites compared to more local universities.

#### *Complexity of the university*

The complexity of a university, referring to its number of faculties, can affect the design and navigability of its website, in order to facilitate the search for information and to move users to the faculties through links, maps, etc. Moreover the larger the university (the more faculties), the larger the amount of potential content which can be revealed on the internet.

Meister-Scheytt and Scheytt (2005, p. 76), in their research on the implementation process of the University Organisation Act of 1993 in Austrian universities, suggest "a frame of reference that is based on an understanding of universities as complex and self-referential organisations". They conducted a two-year, in-depth field study showing that the transformation to a "simple" management orientation is in itself complex.

Therefore we analyse the subsequent hypothesis:

- H6.* The more complex universities will disclose a larger level of information on their websites compared to less complex universities.

#### *Age of the universities*

Another factor that can influence the degree of disclosure of overall information in universities has to do with the age of the universities. In this vein, Banks *et al.* (1997, p. 211) found that "the established universities tended to have better quality disclosure than new universities in the categories of service performance and financial performance", for universities in England, Wales and Northern Ireland.

Murias *et al.* (2008) obtained similar findings for the Spanish public university system, with a higher score for older universities compared to new universities. The reasons for this situation are related to the fact that research groups have had longer to establish themselves and consolidate their research in the older institutions. Moreover



these centres have tended to have – at least up until recently – very large numbers of students and this has meant that they have found it necessary to progressively provide student accommodation, libraries and other services. Furthermore many modern universities have been founded in areas in which older institutions already existed and, in some cases, the creation of these more recent centres has been the result of an excision from an existing university.

Therefore, considering previous studies, we propose the following research hypothesis:

- H7. Older universities disclose more information on their websites than younger universities.

*Other explanatory factors*

*Public versus private universities.* According to Kurtenbach and Roberts (1994, p. 230), public institutions have to cope with higher political costs in comparison to private corporations, due to the high number of constituents – taxpayers, the legislature and assorted politicians – to which they are responsible. Private institutions however are not as subject to these political costs. As a consequence Gordon *et al.* (2002, p. 243) indicate that “when holding all their factors constant, one would expect public institutions to make more extensive disclosures consistent with their multifaceted stewardship roles”.

*Type of university.* Given the increasing demand from students in Spain for technical degrees (Conferencia de Rectores de las Universidades Españolas, 2008) the universities with a strong presence of this kind of degree could use their websites as an adequate mechanism for promoting them and facilitating greater knowledge in the national and international spheres.

*Orientation towards research.* Universities play an essential role in society as producers and transmitters of knowledge. In recent years the discussion about whether universities can encompass a third mission of economic development, in addition to research and teaching, has received growing attention (Mansfield, 1995; Leydesdorff and Meyer, 2003). Industry-research collaborations are extremely important mechanisms for generating technological spill-overs and currently there is an increased level of academic commercial activities, such as patenting and licensing, and generation of spin-off companies (Shane, 2004; Friedman and Silberman, 2003). At the same time many governments have implemented an increasing range of policies encouraging the involvement of universities in technology transfer.

In this context websites are a key mechanism for disclosing the activities undertaken in research and development, technology and transference of their results, as well as their goals and successes (patents, R&D projects subsidised by public funds, etc.), in order to promote that university, reinforce the scores obtained in different lists and obtain a higher volume of funds.

*Variation in student numbers.* An increase or decrease in the number of students in a university may influence its need for disclosure, for instance, by using the internet. In the case of a significant reduction in the number of students, websites can be used as a platform to recruit new students intensely. Moreover this objective involves the creation of a policy framework that encourages universities to meet community and student needs by diversifying their course offerings and providing enhanced levels of information on the nature and quality of these courses for prospective students.

## Research design

### *Population*

In order to achieve the objectives established for the current study the whole set of Spanish universities was selected as our target population. We chose this population because of our interest in broadening and generalising the results obtained in previous studies focused on the analysis of the explanatory factors which influence the volume of information disclosed (e.g. Gordon *et al.*, 2002). The selection also considers the advantage of the availability of information through the internet, thereby overcoming the limitations of previous studies, which have been based on surveys or personal interviews (e.g. Pettersen and Solstad, 2007; Fischer *et al.*, 2004; Gordon *et al.*, 2002).

The population analysed comprises 70 Spanish universities, 48 of which are public universities while 22 are private. The full list and their URLs are displayed in the Appendix. After selecting the sample we carried out a content analysis of the universities' websites.

### *Content analysis: creating a disclosure index*

In order to study the information provided by companies and institutions, one of the most widely used techniques is content analysis (Ettredge *et al.*, 2001; Bonsón-Ponte *et al.*, 2008), which usually consists of scoring the number of times a specific piece of information appears in a text or similar. The content analysis typically leads to a disclosure index, a numerical indicator that reflects the quantity of information disclosed, with the purpose of showing the level of disclosure on the communication channel analysed. Thus the disclosure index is made up of categorical variables – items – that take the value 1 if the institution discloses specific data, and 0 otherwise (Ortiz and Clavel, 2006). An advantage derived from a disclosure index is that it enables the use of statistical techniques for the analysis of the drivers influencing the disclosure of information (García-Meca and Martínez-Conesa, 2004). In this research it can be regarded as an appropriate methodology for analysing the information disclosed, as it has been applied in previous research in the corporate field (e.g. Ettredge *et al.*, 2001; Larrán and Giner, 2002; Xiao *et al.*, 2004).

Consequently we first created a disclosure index. Our sources of factors and items used to create the disclosure index are related to two typologies of previous studies: first descriptive studies referring to the disclosure of global information on behalf of universities worldwide, and second we complement these items with those applied in the revelation of information in other corporate contexts, such as listed companies or civil services.

To create the index we initially considered several descriptive studies that refer to the amount of information provided by universities on their websites; for example Middleton *et al.* (1999) analyse visibility and Lawrence and Giles (1999) study accessibility. Another widely analysed issue is usability (Badre, 2002; Dustin *et al.*, 2002; Chandler and Hyatt, 2003). Still other impact factors are analysed by Smith and Thelwall (2002). We also considered different studies from universities around the world, specifically Banks and Nelson (1994) for Ontario universities, Dixon *et al.* (1991) for New Zealand universities, Banks *et al.* (1997) for universities from England, Wales and Northern Ireland, Nelson *et al.* (2003) for Canadian universities, and Buenadicha *et al.* (2001) for Spanish universities.



In addition to these studies we analysed several descriptive studies that examine the amount of information provided by companies on their websites, in different countries such as the USA (Ettredge *et al.*, 2001), Germany (Marston and Polei, 2004), Austria (Pirchegger and Wagenhofer, 1999), Denmark (Petersen and Plenborg, 2006) and Spain (Larrán and Giner, 2002). These studies focus on verifying a set of issues in the disclosed information on websites, using binary values (1: presence of the information sought; 0: absence of the information sought). Then the values obtained are aggregated and, where appropriate, weighted.

After that revision, and considering the main activities, contributions and responsibilities of universities, our next stage was to design the disclosure index, which is focused on the search for information about these issues: financial information, corporate governance, social responsibility, research, teaching, strategic information, timeliness of information provided, technology, contact information, interactions with other users, navigability and web structure. The final structure is shown in Table I.

The following stage was their quantification. When applying this methodology to establish the levels of disclosed information for each item, one can choose a binary variable, which takes a value of either 1 or 0, depending on whether the data is reported or not (Cooke, 1989), or alternatively one can attempt to estimate a score ranging from 1 to 0. Although the latter solution may be considered conceptually superior, it can lead to a completely subjective evaluation (Giner, 1995).

In this study, according to the most widely used methodology in online disclosure – for example Bonsón and Escobar (2006) in their study about online transparency in the banking sector – we have opted for the binary variables, which have been widely used in previous studies for universities from different countries (Engstrom, 1988; Banks *et al.*, 1997). Nevertheless we assigned a probable score of 2 for some items, because they represent complete information which could potentially be released only partially. These items are:

- complete annual accounts;
- overall university budget;
- complete social responsibility report; and
- complete research report.

We defined partial disclosure as the cases in which universities disclose only some reports from the annual accounts (for instance, only the balance sheet or the income statement), summaries of the main budget figures (e.g. revenues, expenses) without reflecting their origin in detail, some clues as to the activities undertaken in social responsibility (without showing a specific report on it) and some aspects of the research done (without signalling relevant issues, such as origin of funds, types of research, number of patents achieved, etc.).

Hence, in these items, partial disclosure is possible. In that event, we assigned a score of 1, whereas we opted for a score of 2 when all the information was revealed.

Last of all another important issue is the possible weighting of the items, as performed in some studies (Pirchegger and Wagenhofer, 1999; Gandia, 2001). In our research we chose an unweighted index, since according to Giner (1997) there is some arbitrariness inherent to the use of any weighted index. Moreover, studies that use both

Content		Frequency	Percentage
<b>Financial information</b>			
1	Overall annual accounts (2 points)	10	14
2	Annual accounts: partial information	13	19
3	Overall university budget (2 points)	38	54
4	University budget: general indications	20	29
5	Information about previous years (three or five years)	19	27
6	Evolution graphic	14	20
7	External auditing report	5	7
8	Account Court <sup>a</sup> report	2	3
9	Existence of internal auditing	19	27
10	Financial resources stemming from teaching activities (fees, etc.)	35	50
11	Financial resources stemming from research activities	38	54
12	Information from different faculties/departments	42	60
13	Information on the number of students and unitary cost per student	32	46
<b>Corporate governance</b>			
1	Vice-Chancellor's report	12	17
2	Description of the individual governing positions	47	67
3	Webpage for each Pro-Vice Chancellorship	39	56
4	Pro-Vice-Chancellors' curriculum vitae	16	23
5	Description of the collegiate bodies of government	49	70
6	Webpage for the main collegiate bodies	36	51
7	Composition of commissions and committees	39	56
8	News about meetings/agenda	41	59
9	Availability of the information provided in the University Senate, Governing Board	29	41
10	Press news	37	53
11	Organisation chart	10	14
12	Link to University Ombudsman	49	70
13	Existence of an ethics code/disciplinary code	26	37
<b>Social responsibility</b>			
1	Complete Social Responsibility Report (2 points)	2	2.9
2	Partial Social Responsibility Report (1 point)	12	17
3	Report on environmental or social impact	19	27
4	Information set out according to Global Reporting Initiative guidelines	1	1
5	External verification	2	3
6	Disclosure of the policy on sustainable development	20	29
7	Strategic planning of sustainability	14	20
8	Planning of specific activities on sustainability	5	7
9	Implementation of a system of quality evaluation	53	76
<b>Research</b>			
1	Complete research report (2 points)	20	28.6
2	Partial research report (1 point)	16	23
3	Information on R&D projects	80	116
4	Information on research groups	64	91
5	Information on conferences and scientific activities	62	89
6	Collaboration agreements with Basic Research centres	47	67
7	Patents registered, brands and licences of the university	24	34
8	Information on PhD theses	32	46
9	Existence of policies of internal subsidies for research	65	79

(continued)

**Table I.**  
Information online  
disclosed by Spanish  
universities

OIR		Frequency	Percentage
35,3	Teaching activities		
	1 Direct access and link to faculties' and departments' websites	51	73
	2 Academic guides	41	59
	3 Description of the enrolment process	41	59
	4 Information on grants	69	99
	5 Information on mobility	62	89
	6 Online enrolment process	44	63
	7 Pre-enrolment process online	16	23
	8 Teacher-student ratios	8	11
	9 Number of students	38	54
	Strategic information		
	1 Strategic objectives of the university	38	54
	2 Strategic alliances and agreements	4	6
	3 Strategic position of the university in its sector (ranking)	5	7
	4 Drawing-up of specific objectives/annual planning	32	46
	Timeliness		
	1 Current news	68	97
	2 Academic calendar – important events	66	94
	3 Date of last update (frequent update < 3 months)	15	21
	4 Indication of number of visitors	4	6
	Contact information		
	1 Contact e-mail	67	96
	2 Postal address for contact	68	97
	3 Phone contact	67	96
	4 English version	53	76
	5 FAQ	9	13
	6 Contact online	24	34
	7 Suggestion box	30	43
	8 Staff directory	4	59
	<i>Presentation</i>		
	Technology		
	1 Fast download of the main website (< 10 seconds)	69	99
	2 Links with other universities/institutions	69	99
	3 Potential downloads	69	99
	4 Reports in pdf	65	93
	5 Graphs and images	51	73
	6 Use of Flash	26	37
	7 Use of sound files	11	16
	8 Use of video files	21	30
	9 Use of advanced languages (JAVA, XML) to improve the website	6	9
	10 Accreditation of website's security by an independent entity	13	19
	Interactivity with users		
	1 Access and link to information on libraries (catalogue, bibliographic databases, etc.)	68	97
	2 Access and link to information on social and cultural activities and other events	68	97
	3 Information on other university services: foreign languages, sports, radio, etc.	69	99
	4 Information on academic staff: positions, promotion, etc.	55	79
	5 Information on and for general staff	47	67

Table I.

(continued)

	Frequency	Percentage
6 Ability to conduct administrative activities online	10	14
7 Ability to present documents online	10	14
Navigability		
1 Help button (demos, etc.)	15	21
2 Web map/table of contents	62	89
3 Pull down menu	53	76
4 Click over menu	52	74
5 Internal search engine	40	57
6 Back button/Next button for sequential navigation	26	37
7 Newsletters	5	7
8 Contents menu always visible	39	56
E-structure		
1 Number of clicks needed to get to students – enrolment (two clicks)	70	100
2 Number of clicks needed to get to research	69	99
3 Number of clicks needed to get to latest news items or press	70	100
4 Number of clicks needed to get to administration	68	97
5 Print option available in a suitable format	19	27
6 Existence of a restricted area (e.g. for teaching staff)	60	86
7 Contact with the webmaster	16	23

**Note:** The “Tribunal de Cuentas” monitors public finances from public entities. It is the equivalent of the European Court of Auditors in Spain

Table I.

weighted and unweighted indices draw similar conclusions from both types of indices (Choi, 1973; Chow and Wong-Boren, 1987). As a result we have chosen the aggregation of the scores obtained for each item in an unweighted index (as in Cooke, 1989; Raffournier, 1995; Giner, 1997).

After defining the items of information to be included in the disclosure index and studying their quantification and weighting, we performed a thorough analysis of the contents of Spanish university websites. The data were gathered by the authors directly from the websites after a thorough navigation in search of the specific items included in the disclosure index. When there were conflicting interpretations on a specific finding, deliberations took place among the authors in order to reach a consensus.

#### *Analysis of factors: variables and technique*

After specifying the items considered in the content analysis (Table I) we analysed the factors which may have an impact on a greater amount of disclosure on issues.

*Dependent variable.* We tested a dependence model in which the dependent variable refers to a disclosure index obtained from the information revealed by Spanish universities on their websites.

Taking into consideration previous studies (e.g. Middleton *et al.*, 1999; Lawrence and Giles, 1999; Badre, 2002; Dustin *et al.*, 2002; Chandler and Hyatt, 2003; Buenadicha *et al.*, 2001; Smith and Thelwall, 2002) and placing special emphasis on the disclosure of information in universities, we selected the information items to be considered in the disclosure index. Table I shows these information items.

This disclosure index is different from the disclosure index developed by Gallego *et al.* (2009) for financial information. This work goes deeply into the universities'

websites, by also including information on teaching and research activities, social responsibility projects, strategic information, contact information and other issues regarding navigability in the analysis.

*Independent variables.* Table II shows the explanatory variables proposed to test the research hypotheses. The data needed to create these variables were obtained from each university's website.

*Analysis technique.* Based on the variables selected to test the hypotheses we defined Model 1, in which the extent of information disclosed by universities on their websites is a function of institution size, leverage, profitability, governance, internationality, complexity, age, and other variables.

Model 1

Disclosed information online =  $f$ (size, leverage, university profitability, governance, internationality, complexity, age, public versus private university, type of university, research orientation, growth-reduction of students).

The model can be estimated empirically using the following equation:

$$\begin{aligned} \text{DIO}_i = & \beta_0 + \beta_1 \text{Size}_i + \beta_2 \text{Lev}_i + \beta_3 \text{UniProfit}_i + \beta_4 \text{Governance}_i \\ & + \beta_5 \text{Internationality}_i + \beta_6 \text{Complexity}_i + \beta_7 \text{Antiquity}_i + \beta_8 \text{UniPriv}_i \\ & + \beta_9 \text{TypeUni}_i + \beta_{10} \text{Research}_i + \beta_{11} \text{VariatStud}_i + \varepsilon \end{aligned}$$

in which the variables are defined as in Table II.

Variable	Definition	Hypothesis
DIO	Disclosure index obtained after analysing university's website	Dependent variable
Size	University size, measured through the number of students	H1
Leverage	Debt ratio, measured by total debt/total assets ratio	H2
Uniprofit	Own revenue per capita, represented by total revenue/total students ratio	H3
Governance	Number of members of the university's management bodies (generally the vice-chancellor's team)	H4
Internationality	Number of foreign students/number of students	H5
Complexity	Number of faculties in each university	H6
Age	Number of years since the foundation year	H7
UniPriv	Dummy variable which takes the value 1 if the university is private, and 0 otherwise	Control variable
TypeUni	Number of technical degrees offered by the university	Control variable
Research	Ratio between PhD theses awarded and the number of students in each university	Control variable
VariatStud	Growth or reduction in the number of students from 2006 to 2007	Control variable

**Table II.**  
Main variables

Model 2 was checked empirically through a linear regression, estimated by OLS. As mentioned above, the dependent variable was obtained from the analysis of items in the disclosure index of the websites.

## Results

### *Content analysis of university websites*

As stated above, we first performed a content analysis of Spanish universities' websites. The results are displayed below and commented on according to the different groups of items analysed.

Table I summarises the findings for the information disclosed by Spanish universities.

*Financial information.* First, it is worth emphasising that Spanish universities disclose a low volume of financial and economic information. They disclose very little information about annual accounts; 14 per cent report the whole set of annual accounts (balance sheet, income statement, report, budget liquidation, cash surplus) and 19 per cent reveal some aspects of the accounts. However most universities report information on financial budgets (revenues budget and expenses budget), usually specifying the origin of funds (teaching and research) and the distribution among departments and faculties.

Other relevant items which can facilitate financial and economic analysis are disclosed in a minor way: auditing report (7 per cent), evolution graphs (20 per cent), information about previous years (27 per cent), and the Account Court's report (3 per cent). Overall 4.79 out of the 13 potential items are disclosed by each university on average.

*Corporate governance.* The items related to corporate governance are more widely disclosed by Spanish universities, especially those concerning the description of individual and collective governing bodies (67 per cent and 70 per cent, respectively). Graphics and vice-chancellors' CVs are not often revealed. News and agenda are disclosed to some extent (59 per cent).

*Social responsibility.* These universities seem to be reluctant to reveal aspects of social responsibility. Only 2.9 per cent include a global report on SR and 17 per cent display a partial report (a summary of social responsibility activities without elaboration), whereas 27 per cent provide a report on environmental and social impact. Only 29 per cent disclose some aspects of sustainability. However a high percentage of universities have implemented a system for quality evaluation (76 per cent).

*Research.* Since universities are institutions with a specific focus on research, most of them are expected to use the internet in order to reveal their aims and achievements. Although research reports are scarcely disclosed (23 per cent in a summarised report), most universities reveal information on R&D projects (80 per cent), research groups (91 per cent) and conferences (89 per cent). In addition, many of them describe public subventions for research (79 per cent).

*Teaching activities.* As well as disclosure for research the revelation of information about teaching activities – the other main purpose of universities – is expected to attain high scores. As Table I reflects, these items are widely disclosed by Spanish universities. Almost all of them reveal information on grants and fellowships. Most (73 per cent) have a direct link to departments and faculties, and 59 per cent exhaustively describe the enrolment process.



*Strategic information.* The disclosure of strategic plans and objectives is made by just half of Spanish universities. Some 54 per cent reveal general strategic objectives, while 46 per cent disclose specific aspects concerning strategy issues. On average they disclose 1.13 out of four potential items.

*Timeliness and other issues.* Current news and relevant events are revealed by almost the whole set of Spanish universities. Many universities have internal bulletins disclosed on their websites. The date of last update is only disclosed by 21 per cent; however, given that university websites are especially dynamic – at least in research and teaching disclosures – this item may not be representative.

Most Spanish universities show contact information, by post, e-mail or phone. In addition many of them present their information in other languages (usually English) and offer a personnel directory to search for specific staff members (59 per cent).

Under the technology category, 99 per cent of Spanish universities enable a fast download of the main website, and have links with other universities and entities. Previous studies (Pirchegger and Wagenhofer, 1999; Marston and Polei, 2004) consider that a download is fast if the homepage on the screen is completed within ten seconds. Moreover most Spanish universities show reports in PDF format. However, the use of advanced languages (JAVA, XML) to improve the website's image is scarce (just 9 per cent).

University websites provide users with a wide range of interactive possibilities. Information on libraries, cultural activities and other university services (e.g. languages, sports) are extensively disclosed. In addition teachers and general staff can receive information through the internet. However, the ability to perform administrative activities online is limited.

All the websites are designed so that information for students and information on administration, current news and research activities can be reached immediately. These structures are supported by internal search engines, webmaps and content display. Restricted areas are also widely used by universities (86 per cent).

#### *Empirical analysis: factors behind the disclosure of information*

After performing a content analysis of Spanish universities' websites we checked the influence of certain factors on the disclosure of information online. The descriptive statistics and correlations amongst the variables studied are reflected in Table III. On

	Mean	Median	Maximum	Minimum	SD
DIO	52.05	55.00	87	23	15.06
Leverage	0.67	0.81	0.89	0.10	0.25
UniProfit	8,453.86	7,505.36	49,242.81	1,078.67	6,065.57
Governance	8.13	9	16	1	3.10
UniPriv	0.33	0	1	0	0.74
Size	21,945	13,864	180,000	652	25,933
Age	108	26	790	6	193
Research	0.006	0.005	0.02	0.00	0.005
Complexity	14.07	11	46	2	9.66
Internationality	0.018	0.0098	0.083	0.00	0.019
VariatStud	1,404	791	35,423	- 37,213	7,783
TypeUni	14	12	50	1	10.83

**Table III.**  
Descriptive statistics

average Spanish universities have a leverage of 67 per cent, a profitability of €8,453 per student, eight Pro-Vice-Chancellors, 21,945 students, 14 faculties and 14 technical degrees in each university, although there are some variables – for instance, size and profitability – with a high variability (standard deviation).

Concerning the correlations amongst the variables studied (Table IV) the highest correlations with the dependent variable are shown in the variables UniPri (–0.804), governance (0.733) and size (–0.562), which stresses that the disclosure of information online is mainly undertaken by public universities with a larger number of Pro-Vice-Chancellors and with a lower number of students.

The findings of the empirical analysis are shown in Table V.

The model run – which attempts to determine the explanatory factors of the information disclosed by universities on their websites – shows a relatively high explanatory power, 56.9 per cent, for a confidence level of 95 per cent ( $p$ -value < 0.05).

From the independent variables proposed to test the hypotheses, three of them – size, internationality and profitability – turn out to be statistically significant for a confidence level of 90 per cent ( $0.05 < p < 0.10$ ) in the case of the first and second variables and 95 per cent for the third variable. Size and internationality show positive effects, while profitability has a negative effect on the dependent variable.

The results obtained for size are consistent with previous evidence, both in businesses (Craven and Marston, 1999; Oyelere *et al.*, 2003; Marston and Polei, 2004; Bonsón and Escobar, 2004) and in universities (Gordon *et al.*, 2002). Large universities reach a wide audience and consequently must maintain their corporate images through intensive disclosure on the internet. In the same vein universities with an international scope are especially likely to disclose their activities in order to attract and recruit students worldwide. In an increasingly competitive context the internet can help universities to create a competitive advantage by making websites a relevant tool for disclosing activities, courses offered, facilities available and the faculty, as well as for promoting the university internationally.

The negative sign of profitability is not in accordance with different theories (e.g. agency, signalling or political costs theories) that assume a positive relationship between profitability and disclosure. The disclosure of information by universities does not seem to follow the logical implications of disclosure by private companies. This can be interpreted in the sense that the less profitable the university is, the more use of disclosure. This finding seems to suggest that corporate disclosure can be a tool used to compensate for a poor economic performance or financial problems. Universities in that situation can undertake an intense policy of disclosure in order to improve their corporate images and reveal the activities they do on a regular basis. Corporate disclosure through the internet can attract new students, which can improve the financial situation of the university and would be useful for emphasising the contribution of the university to society.

Other independent variables such as leverage and complexity display positive signs, but their effects are statistically insignificant. Despite the fact that leverage is a relevant driver behind the disclosure of information in businesses, our findings are in line with Gordon *et al.* (2002), who obtained a non-significant effect. As with profitability we found that the specific features of universities (e.g. they are usually part of the civil service) lead them not to follow the main parameters of corporate

**Table IV.**  
Correlations matrix

	DIO	Leverage	UniProfit	Governance	UniPri	Size	Age	Research	Complexity	International	VariatStud	TypeUni
DIO	1											
Leverage	-0.266	1										
UniProfit	-0.084 **	0.081	1									
Governance	0.733 **	0.023	0.029	1								
UniPriv	-0.804 **	-0.295 *	-0.074	-0.765 **	1							
Size	0.562 **	-0.190	-0.178	0.583 **	-0.393 **	1						
Age	0.361 **	-0.122	-0.101	0.246	-0.282 *	0.384 **	1					
Research	-0.008 **	0.083	0.564 (**)	0.143	-0.214 **	-0.041	0.056 **	1				
Complexity	0.509 **	-0.032	0.240	0.490 **	-0.579 **	0.352 **	0.438 **	0.365 **	1			
Internationality	0.247 **	-0.112	-0.388 (**)	0.149	-0.189	0.242	0.128	0.374 **	0.259 **	1		
VariatStud	0.260	-0.142	0.717 (**)	0.262	-0.075	0.630 **	0.107	-0.504 **	-0.159	0.561 **	1	
TypeUni	0.219	-0.062	0.423 (**)	0.239	-0.374 **	0.069	0.041	0.256	0.474 **	-0.223	-0.344 *	1

**Notes:** \*Significant at 0.05; \*\* significant at 0.01

Variable	Standardised coefficients
Leverage	0.024 (0.136)
Profitability	- 0.837 (- 2.616**)
Governance	- 0.152 (- 0.709)
Private university	0.196 (1.181)
Size	0.700 (2.191**)
Age	- 0.221 (- 1.110)
Research orientation	- 0.266 (- 1.318)
Complexity	0.309 (1.471)
Internationality	0.361 (1.965*)
Variation of students	- 0.498 (- 1.267)
Type of university	0.280 (1.413)
<i>F</i>	2.515**
<i>R</i> <sup>2</sup>	0.569

**Table V.**  
Factors behind disclosure  
of information online

**Note:** Dependent variable: index of disclosure of information online

disclosure in the business context. For complexity the results are consistent with those of Gallego *et al.* (2009) who also found no effect.

Finally governance and age exhibit negative signs; however, the impact on disclosure is statistically insignificant and therefore these factors do not influence the revelation of information from a statistical point of view.

Among other explanatory variables, private university and type of university show a positive relationship with the disclosure of information online, while research orientation and variation in student numbers present an inverse direction; none of them turn out to be statistically significant. Consequently, from a statistical perspective, neither the type of university (in the sense of being more technically-focused) nor private status influence the volume of information disclosed.

The overall results obtained for the model estimated allow us to accept *H1* and *H6*, related to positive relationships among size, internationality and the disclosure volume of information on websites from the Spanish universities. Regarding *H3*, which analyses whether more profitable universities disclose a larger amount of information on their websites, the relationship has an inverse sign and therefore the hypothesis is accepted with the opposite sign to that expected.

Therefore our findings evidence the low degree of disclosure culture developed by Spanish universities, while they do not seem to respond to some factors whose influence has been confirmed in other countries (e.g. Banks *et al.*, 1997) and other public institutions. In addition the behaviour of some variables – such as leverage,

complexity and governance, among others – seems to suggest that disclosure in universities is not led by the same parameters or features that are behind corporate disclosure in businesses.

### Conclusions

Universities, as public institutions in some cases and private companies in others, can improve their relationships with users – e.g. students, teachers, general staff and so on – through the disclosure of their services on the internet, revealing information about their finances, research, teaching activities, and through the ability to interact with users. As institutions that create knowledge and train the future generations of a country, universities have a special importance for societies and their influence reaches a wide range of users.

In this study we first aimed to describe the main website contents of Spanish universities, focusing on financial information, governance, corporate social responsibility, teaching activities, research, structure and technology, amongst other aspects. Our findings emphasise that their website content usually relates to research and teaching activities, which can be regarded as their main contributions to society. Other issues such as corporate governance, social responsibility and strategic information are less widely disclosed.

In a subsequent research stage we analysed certain factors that may influence the disclosure of information on the part of Spanish universities. Our findings stress the low degree of disclosure by universities of issues related to financial information, corporate governance, social responsibility and strategic information. No influence of complexity or leverage on the disclosure of information was detected. However we obtained a positive association between size and disclosure, and between internationality and disclosure. This latter finding can be derived from the fact that a higher level of information disclosed by universities can recruit more foreign students, for whom universities' websites will be the main source of knowledge about the universities' activities and services, and financial condition. Therefore websites will become a relevant tool for disclosing activities and for promoting the university internationally.

Moreover we found an inverse relationship between profitability and disclosure, contrary to that expected for firms. This result with the opposite sign to that expected is not in accordance with different theories (agency, political costs, signalling) that tend to assume a positive relationship between profitability and disclosure.

Therefore our results suggest that a situation of financial distress or poor economic performance in universities can be outweighed by a disclosure policy that can improve corporate image. This study shows that factors considered useful for explaining corporate disclosure in businesses may not be relevant for explaining the revelation of information in other kinds of institutions such as universities. In this regard neither leverage, governance nor complexity seem to lead to a higher degree of disclosure. Consequently our findings stress that some of the drivers behind corporate disclosure according to traditional theories are not directly applicable to other institutions, even private universities.

This work has also evidenced a low volume of corporate disclosure and, specifically, financial information on universities' websites. Given that universities receive a large amount of public funds and undertake a considerable process of resource allocations,

they should increase the disclosure of information (even on a regulatory basis), in order to enhance their transparency. In fact the absence of information about their objectives and figures can make it difficult for interest groups to make informed judgements about the success of the universities in meeting their objectives and budgets, as well as to obtain an overall perspective on university affairs. Moreover the ability to perform administration tasks online would improve the websites.

In line with many of the studies using the methodology of disclosure indices, our work has some limitations. First, the use of an unweighted index may be regarded as a simplification, although this kind of index has been widely used in previous studies in this vein (e.g. Giner, 1997). Moreover content analysis has several drawbacks: it is static and may not take into consideration the dynamic nature of the websites; it may include some element of the analyst's judgment; it mainly reflects the volume of information disclosed, without considering the quality in some degree of detail. Second, although we studied the whole set of Spanish universities – both public and private – the number of observations is reduced; therefore our findings could be made more consistent by broadening the scope of study to universities from other countries. Third, we analysed only the main website of each university, which is usually the first to be accessed from the perspective of the general public. Finally, there are other factors that have an indubitable influence on the disclosure of information by universities and that have been omitted from this study, for example the importance of social activities undertaken by universities. These drivers should be analysed in more depth in future studies, and an international perspective is necessary to complement the findings obtained here.

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## Appendix. Spanish universities and their websites

	Website
<i>Public universities</i>	
UNED	www.uned.es
Universidad Autónoma de Barcelona	www.uab.es
Universidad Autónoma de Madrid	www.uam.es
Universidad Carlos III	www.uc3m.es
Universidad Complutense	www.ucm.es
Universidad de Alcalá de Henares	www.uah.es
Universidad de Alicante	www.ua.es
Universidad de Almería	www.ual.es
Universidad de Barcelona	www.ub.edu
Universidad de Burgos	www.ubu.es
Universidad de Cádiz	www.uca.es
Universidad de Cantabria	www.unican.es
Universidad de Castilla La Mancha	www.uclm.es
Universidad de Córdoba	www.uco.es
Universidad de Extremadura	www.unex.es
Universidad de Girona	www.udg.edu
Universidad de Granada	www.ugr.es
Universidad de Huelva	www.uhu.es
Universidad de Jaén	www.ujaen.es
Universidad de La Coruña	www.udc.es
Universidad de La Laguna	www.ull.es
Universidad de La Rioja	www.unirioja.es
Universidad de las Islas Baleares	www.uib.es
Universidad de Las Palmas	www.ulpgc.es
Universidad de León	www.unileon.es
Universidad de Lleida	www.udl.es
Universidad de Málaga	www.uma.es
Universidad de Murcia	www.um.es
Universidad de Oviedo	www.uniovi.es
Universidad de Salamanca	www.usal.es
Universidad de Santiago	www.usc.es
Universidad de Sevilla	www.us.es
Universidad de Valencia	www.uv.es
Universidad de Valladolid	www.uva.es
Universidad de Vigo	www.uvigo.es
Universidad de Zaragoza	www.unizar.es
Universidad del País Vasco	www.ehu.es
Universidad Jaume I	www.uji.es
Universidad Miguel Hernández	www.umh.es
Universidad Pablo Olavide	www.upo.es
Universidad Politécnica de Cartagena	www.uptc.es
Universidad Politécnica de Cataluña	www.upc.edu
Universidad Politécnica de Madrid	www.upm.es
Universidad Politécnica de Valencia	www.upv.es
Universidad Pompeu Fabra	www.upf.edu
Universidad Pública de Navarra	www.unavarra.es
Universidad Rey Juan Carlos	www.urjc.es
Universidad Rovira-Virgili	www.urv.cat

**Table A1.**  
Spanish universities and  
their websites

(continued)

	Website
<i>Private universities</i>	
U. Mondragón Univertsitatea	www.mondragon.edu
Universidad Abat Oliba CEU	www.uao.es
Universidad Alfonso X El Sabio	www.uax.es
Universidad Antonio de Nebrija	www.nebrija.es
Universidad Camilo José Cela	www.ucjc.edu
Universidad Cardenal Herrera - CEU	www.uch.ceu.es
Universidad Católica de Avila	www.ucavila.es
Universidad Católica de Valencia San Vicente Martir	www.ucv.es
Universidad Católica San Antonio	www.ucam.edu
Universidad de Deusto	www.deusto.es
Universidad de Navarra	www.unav.es
Universidad de San Jorge	www.usj.es
Universidad de Vic	www.uvic.cat
Universidad Europea de Madrid	www.uem.es
Universidad Europea Miguel de Cervantes	www.uemc.es
Universidad Francisco de Vitoria	www.ufv.es
Universidad Internacional de Catalunya	www.uic.es
Universidad Oberta de Catalunya	www.uoc.edu
Universidad Pontificia de Comillas	www.upcomillas.es
Universidad Pontificia de Salamanca	www.upsa.es
Universidad Ramon Llull	www.url.edu
Universidad San Pablo – CEU	www.uspceu.es
Universidad SEK	www.sek.edu

**Note:** All websites accessed July 2008

**Table AI.**

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