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**Disclosure of University Websites. Evidence From Italian Data**

**IHELG Monograph**

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## Disclosure of university websites. Evidence from Italian data

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**Abstract:** Universities are required to gain a competitive advantage in recruiting students and obtaining funds. The Bologna Declaration has emphasised this process, highlighting both the need to improve quality as well as the importance of providing information to stakeholders. The paper focuses on the information requirements, with the aim of analysing the disclosure of information by Italian universities through their websites. We have calculated both a global disclosure index and different partial disclosure indices relating to the areas of interest of the main stakeholders: the study reveals that Italian universities achieve a satisfactory rate in disclosing information relating to research and teaching activities. We have also performed a disclosure determinant analysis in order to investigate the reasons why some universities disclose more or less information than others: complexity and social responsibility are the factors that affect the disclosure level the most. Our paper deals with public universities, focusing on information disclosed via websites while previous literature has mainly analysed private entities dealing with information disclosed through financial statements.

**Keywords:** disclosure index; disclosure determinant analysis; websites; university; Italian data.

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## **1 Introduction**

Nowadays, universities are managed in an increasingly competitive environment (Parker, 2013). They are also required to build up and preserve a distinct image in order to gain a competitive advantage (Paramewaran and Glowacka, 1995) when recruiting students and obtaining funds (Murias et al., 2008). The Bologna Declaration, and the consequent convergence program within Europe, has implicitly emphasised this process, highlighting both the need to improve quality as well as the importance of providing information to stakeholders. Furthermore, the Italian Government has recently modified the legislation concerning universities, emphasising this process.

In this paper, we focus on the information requirements, with the aim of analysing the disclosure of information by Italian universities through their websites.

The need to examine this topic derives not only from the requirements imposed by the law but also because stakeholders are increasing their demand to obtain information through websites. In a preliminary step of this study, we analysed the social reports recently published by several Italian universities, with the website resulting the main source of information, especially for students to whom specific questionnaires were distributed. Along the same lines – and in more general terms – different studies [Angluin and Scapens (2000) examined UK universities; Fischer et al. (2004) and Gordon et al. (2002) studied USA universities; Pettersen and Solstad (2007) analysed Norwegian universities; Nelson et al. (2003) examined Canadian universities] have focused on surveys and interviews.

These preliminary findings suggest focusing not only on the disclosure of financial information but also on the wider disclosure of websites of Italian universities. In fact, websites provide an effective disclosure system that has many advantages (the main one is that stakeholders can access the information very quickly and easily). For example, in the Spanish context, Buenadicha et al. (2001) and Olsina et al. (2001), analysed the accessibility and speed in Spanish university websites from a descriptive perspective, while Alvarez et al. (2011), provided an in-depth study of the disclosure of Spanish university websites.

Generally, current international literature has investigated disclosure (prevalently of financial statements) in two main directions:

- 1 disclosure level evaluation, analysing the approach organisations have towards disclosure
- 2 disclosure determinant analysis, investigating the reasons why some organisations disclose more or less information than others (Chavent et al., 2006).

International literature mainly refers to a method consisting of calculating a disclosure index, followed by a multivariate linear regression, with the index being a dependent variable and several characteristics of the organisation independent variables.

The aim of the paper is, firstly, to calculate a disclosure index of each website (we investigated all the Italian public universities) through the analysis of different aspects, such as: research, teaching activities, governance, financial information, social responsibility, web structure, etc. The Cooke (1989a) approach has been referred to. However, the weight of each variable analysed has not been considered, due to an assigned weight being exposed to subjective interpretation, thus risking the analysis being invalidated. The second aim is to understand which variables affect the disclosure index the most.

The main findings of this research are that Italian universities achieve a satisfactory rate in disclosing information relating to research and teaching activities as well as their governance. The factors that affect the disclosure level the most are complexity and social responsibility.

The paper is set out as follows. The next section reviews current literature in order to clarify what factors affect the disclosure of information by universities as well as to state the research hypotheses. The third section explains the research method adopted, while the fourth presents and discusses the results. Finally, the fifth section presents the conclusions and further developments of the study.

## 2 Literature review and research questions

As a starting point, we assume that the website of each university is one of the main information sources for stakeholders. This assumption affects at least three aspects: identification of different categories of stakeholders and their needs; what kind of information universities have to disclose; disclosure level evaluation and disclosure determinant analysis. As previously stated, we focus on the third element, even though we implicitly take into account the first and second, when identifying the variables to be analysed in evaluating the disclosure level.

The evaluation of the disclosure level can be based on either weighted or unweighted items.

Current international literature has principally evaluated the disclosure level by calculating a disclosure index (other studies adopted content analysis; see Freedman and Jaggi, 2011; Ghomi and Leung, 2013). Buzby (1975, p.27) and Stanga (1976, p.48) first used this approach, which was subsequently formalised by Cooke (1989a, 1989b) who expressed the index in the following terms:

$$\text{Disclosure index} = \frac{\text{Actual disclosure}}{\text{Total possible disclosure}} = \frac{\sum_{i=1}^m di}{\sum_{i=1}^n di} \quad (1)$$

where:

$d$  = 1 if the item  $d_i$  is disclosed (0 otherwise)

$m$  = numbers of items disclosed

$n$  = maximum number of disclosure items possible.

The Cooke index is based on unweighted items. However, some studies (Buzby 1975; Firth, 1979; Giner, 1997; McNally et al., 1982; Stanga, 1976) adopted weighted items for the reason that some items could be more important to users than others. According to the most significant literature (Ahmed and Nicholls, 1994; Archambault and Archambault, 2003; Akhtaruddin and Rouf, 2011; Chen and Jaggi, 2000; Cooke, 1989b, 1991, 1992, 1993; Hossain et al., 1994, 1995; Rouf, 2011; Tai et al., 1990; Uyar and Kılıç, 2012; Wallace et al., 1994) and in order to reduce subjectivity, we refer to unweighted items, an approach that represents the norm [Ahmed and Courtis, (1999), p.36].

However, in identifying variables to be included in the model, we have firstly distinguished the following areas of interests of the stakeholders:

- 1 research
- 2 teaching activities
- 3 governance
- 4 financial information
- 5 social responsibility
- 6 interactivity with users.

After a description of each area of interest, we draw up a list of items used in calculating both a specific disclosure index concerning the specific area of interest investigated and the global disclosure index concerning all the information (i.e., all the items analysed). More specifically, for each variable we assign 1 if the website discloses information about it, 0 otherwise [see the numerator of the equation (1)]. As we will explain later, the global disclosure index is the dependent variable of our model.

The analysis of each area of interest, based on previous literature, also allows to investigate the determinants of the disclosure index. Accordingly, we identify the research hypotheses of our study and the related independent variables of our model, through which we will try to understand what factors affect the global disclosure index the most.

## 2.1 Research

Even though a distinction between research universities and teaching universities could be proposed, in the Italian context, the strategic mission of all public universities includes both these activities. However, some universities are known as hubs of excellence in research. Consequently, they are interested in communicating their performance in terms of patents, projects financed by public authorities, generation of spin-off companies and so on. In more general terms, scholars (Leydesdorff, 2012; Leydesdorff and Meyer, 2003; Mansfield, 1995) have highlighted how the collaboration between industries and universities is currently playing a key role (the so called third mission). Accordingly,

many universities are increasing their commercial activities as demonstrated by the growth in the number of patents and spin-off companies.

The items we analysed in order to calculate the disclosure index (i.e., the dependent variable of our model) are:

- national research projects (PRIN) subsidies by the Ministry of Higher Education (hereafter MIUR)
- spin-offs
- patents
- publications (articles, books, book chapters).

As stated above, for each item we assign 1 if the website discloses information about it, 0 otherwise.

Focusing on the Italian context, a recent reform has defined new criteria in assigning funds based on the research performances of each university. Accordingly, websites should play a crucial role in disclosing the research activities and illustrating the obtained results (also in the light of the third mission), with the aim of promoting the university, strengthening its score in national and international lists as well as obtaining a higher volume of funds from both the MIUR and private enterprises.

Thus, the first hypothesis is:

H1 Universities that obtain a better research performance have a higher global disclosure index compared to Universities with a low research performance.

## 2.2 *Teaching activities*

According to the point of view of students, the key users of teaching activities, university websites are the main information source. In a preliminary step of our research, we distributed a questionnaire to newly enrolled students and in more than 40% of the cases, they choose the degree courses after obtaining all the necessary information from the websites. In more general terms, universities usually provide information about faculties and departments as well as masters and PhD courses through their websites.

Taking into account that in Italy there are first and second level degrees and that a considerable percentage of students (<http://www.almalaurea.it/universita/profilo/>) change universities between first and second-degree levels, there is stiff competition between universities to enrol new students. Consequently, it is in their own interests to disclose as much information as possible in relation to their teaching activities as well as work experience opportunities, highlighting the ability to facilitate the transition from university to the world of work. From this point of view, in order to support gathering information, a national consortium (known as ‘Almalaurea’) was established and every university, which has freely joined, provides all the information relating to this topic.

The items we analysed in the calculation of the disclosure index (we assigned 1 if the website discloses information about it, 0 otherwise) are:

- adhesion to ‘Almalaurea’
- graduates in the set time
- graduates who find jobs within a year of graduating

- average degree score
- online registrations
- student grants
- PhD courses
- masters
- number of faculties
- number of enrolled students.

Many of these variables can be interpreted as proxies of both the complexity and size of the university.

Regarding the complexity (expressed, for example, by the number of faculties), it affects the amount of information universities have to disclose as well the surfing of the website (through links which facilitate the search for information concerning each faculty).

Regarding size, many studies relating to listed firms found a positive link between size and voluntary information disclosed through financial reporting (Cooke, 1989a, 1991; Hossain et al., 1995). Other papers have analysed the same topic investigating the disclosure level of public organisations. While several works (Christiaens, 1999; Laswad et al., 2005) have not found any influence of size on disclosure, others (Gordon et al., 2002) reached contrary results.

We suggest the following hypotheses:

H2a The more complex universities have a higher global disclosure index.

H2b Larger universities have a higher global disclosure index.

### *2.3 Governance*

Starting from the premise that the performances of organisations largely depend on the strategic vision and mission of their management bodies, it can be assumed that a more effective board should be more inclined to disclose information about its success, having a higher external pressure to provide information. In fact, there seems to be a link between the increase in disclosure information and the quality of management (Christiaens, 1999; Laswad et al., 2005, who refer to municipalities).

However, it is not easy to operationalise the quality of management. International literature [Ingram, (1998), p.12] suggests referring to the size of management bodies (i.e., the larger the management bodies, the higher the quality of governance) on the ground that size influences the effectiveness of a board. From an opposite point of view, it can be argued that lean management is more effective. Accordingly, the quality of governance can be positively affected by a 'thin' board.

The items we analysed in the calculation of the disclosure index (we assigned 1 if the website discloses information about it, 0 otherwise) are:

- composition of the academic senate
- composition of the administrative board (board of directors)

- delegates of the chancellor
- adoption of an ethics code.

The third hypothesis is the following:

H3 Universities with fewer members in their management bodies have a higher global disclosure index.

#### *2.4 Financial information*

Another set of items to be considered in calculating a disclosure index concerns financial information, provided through budgets and financial statements. Accordingly, the items we analysed in evaluating the disclosure level are:

- budget
- budget of previous years (i.e., the last two years)
- long-term budget
- financial statements
- financial statements of previous years (i.e., the last two years)
- audit reports.

For each item, we assigned 1 if the website discloses information about it, 0 otherwise.

Numerous studies have calculated a disclosure index of listed and non-listed firms, basing the analysis on information disclosed through their financial statements. In many cases, the performances of these firms (expressed in terms of sales, earnings, EBITDA and so on) positively affect the amount of information disclosed.

In the case of public sector organisations, some studies (Christiaens, 1999; Laswad et al., 2005; Alvarez et al., 2011) have observed this relationship. The underlined assumption is that the greater the profitability of a university, the higher pressure to disclose information.

However, traditional indicators of profitability are not suitable in our case. In accordance with Cohen et al. (2012), they could provide a misleading picture of the ability of public universities to achieve an adequate level of profitability. In addition, Italian universities traditionally adopt a commitment-based budgetary accounting system (Anessi Pessina and Steccolini, 2007; Caperchione, 2003) and only recently they are testing a full accrual accounting approach. Consequently, we suggest focusing on current revenues and current expenses, whose control is critical for the financial viability of universities. It is therefore worth noting that the MIUR is paying increasing attention to the financial and economic conditions of universities that, according to Legislative Decree No. 199/2011, have to respect several financial parameters, largely based on current revenues and expenses. If a university fails to comply, the MIUR declares its financial distress.

In accordance with these considerations, we posit the following fourth hypothesis:

H4 Financial performances of universities positively affect the disclosure index.

## 2.5 Social responsibility

Currently, international literature as well as practitioners are emphasising the social responsibility of private and public organisations, even though it is difficult to define it. In general, there is no single authoritative definition of the expression 'corporate/organisational social responsibility'. However, most definitions highlight the interrelationship between the economic, environmental and social aspects of the activities carried out by an organisation. Moreover, there is a link between social responsibility and the principle of accountability, which is itself supported by the principle of inclusivity [e.g., accountability to all the stakeholder groups; see Cooper and Owen, (2007), p.650].

Considering the aim of this study, it is important to note that social responsibility goes beyond a mere compliance with legal obligations, being related to voluntary commitments. In addition, as stated by Archel et al. (2011), governments are increasingly embracing the sustainable development discourse, stimulated by the publication of the EU Green Paper in 2001, which has obliged Member State governments to actively develop public policies that encourage corporate social responsibility as well as corporate accountability.

The items we have included in the calculation of the disclosure index are:

- complete social responsibility report
- partial social responsibility report
- policies on environmental sustainability
- use of alternative energy sources (e.g., solar energy)
- implementation of evaluation quality systems.

Thus, for each item, we assigned 1 if the website discloses information about it, 0 otherwise.

The hypothesis is the following:

H5 The more socially responsible universities have a higher disclosure index, disclosing more information on their websites.

## 2.6 Interactivity with users

Finally, we have included the following items in the evaluation of the disclosure index (for each item, we assigned 1 if the website discloses information about it, 0 otherwise) relating to the surfing and accessibility of websites:

- internal search engine
- site map/table of contents
- access and link to information on libraries (catalogue, bibliographic database, etc.)
- access and link to information on social and cultural activities
- website in English.

### 3 Research design and methodology

In order to test the hypotheses of the study, we analysed all of the Italian public universities.

Starting from an initial population of 67 universities, we excluded:

- The Italian Institute of Human Science ('Istituto Italiano di Scienze Umane') of Florence; Institutions, Markets and Technologies (IMT, 'Istituzioni, Mercati, Tecnologie') of Lucca; University Institute of Higher Education ('Istituto Universitario di Studi Superiori') of Pavia because they concentrate on narrower and more specialised activities than other universities. This difference affects the level of disclosure and the comparability with the rest of the population.
- The University of Camerino, the universities for foreigners of Perugia and Siena, the University of Rome 'Foro Italico', the University of L'Aquila, the 'Scuola Normale Superiore' of Pisa, the 'Scuola Superiore di Studi Universitari S. Anna' of Pisa, the 'Scuola Internazionale Superiore di Studi Avanzati' of Trieste and the University of Trento due to the lack of data concerning some independent variables included in the regression model.

Consequently, 55 universities compose the final sample (Appendix reports the list and their URLs).

We measured the level of disclosure by calculating a disclosure index [equation (1)]:

$$\text{Disclosure index} = \frac{\text{Actual disclosure}}{\text{Total possible disclosure}} = \frac{\sum_{i=1}^m di}{\sum_{i=1}^n di} \quad (1)$$

In detail, we followed these steps:

- for each item considered, we assigned the value 1 if the website discloses it, 0 otherwise ( $m$  = number of items disclosed)
- we calculated the total score (actual disclosure)
- we compared this score with the maximum score (total possible disclosure;  $n$  = maximum number of disclosure items possible).

As stated above, we calculated both the different partial disclosure indices (one for each area of interest) and a global disclosure index (taking into account all the items disclosed), adopting an unweighted approach in order to avoid subjectivity. However, studies that use both weighted and unweighted indices draw similar conclusions from both types of index (Choi, 1973; Chow and Wong-Boren, 1987).

We carried out a systematic analysis of the contents of the Italian university websites. We collected the information directly from the websites of the Italian universities (from 15 March to 13 April 2012), by carrying out a thorough search of the specific items.

After descriptive statistics concerning all the items considered, we carried out a regression model where the (global) disclosure index is the dependent variable, in order to evaluate what factors affect this index the most:

$$DI = \alpha_1 + \beta_1 Research_i + \beta_2 Complexity_i + \beta_3 Size_i + \beta_4 Qual\_Gov_i + \beta_5 Fin\_info_i + \beta_6 Soc\_resp_i + \beta_7 Age_i + \varepsilon_i.$$

where:

<i>DI</i>	Disclosure index (dependent variable), calculated following the equation (1).
<i>Research</i>	Research output, expressed through the ratio between the number of national research projects (PRIN) subsidies by the MIUR and the number of researchers (we have referred to the last PRIN approved in March/April 2012, the period of our investigation). This variable refers to H1 (expected sign: +).
<i>Complexity</i>	university complexity, measured through the logarithm of the number of faculties. It refers to H2a (expected sign: +).
<i>Size</i>	University size, measured through the logarithm of the number of students. It refers to H2b (expected sign: +).
<i>Qual_Gov</i>	Quality of governance, expressed through the number of members of the university board of directors. It refers to H3 (expected sign: -).
<i>Fin_info</i>	Financial information about performance, expressed through the ratio between current revenues and current expenses (including medium- and long-term loan repayment); this ratio illustrates the ability of current revenue to 'cover' all current expenses and it should be equal or greater than 1. This variable refers to H4 (expected sign: +).
<i>Soc_Resp</i>	Social responsibility, expressed as a dummy variable which is equal to 1 if universities have implemented evaluation quality systems, 0 otherwise. It refers to H5 (expected sign: +).
<i>Age</i>	Age of universities, expressed as years between 2012 and the foundation of each university (control variable; expected sign: -).

Table 1 summarises the variables included in the model in order to test our hypotheses.

**Table 1** Variables included in the model

<i>Variables</i>	<i>Definition</i>	<i>Hypothesis</i>	<i>Expected sign</i>
<i>DI</i>	Disclosure index		Dependent variable
<i>Research</i>	Research output, expressed through the ratio between the number of National research projects subsidies by the Ministry of Education and the number of researchers	H1	+
<i>Complexity</i>	University complexity, measured through the logarithm of the number of faculties	H2a	+
<i>Size</i>	University size, measured through the logarithm of the number of students	H2b	+

**Table 1** Variables included in the model (continued)

<i>Variables</i>	<i>Definition</i>	<i>Hypothesis</i>	<i>Expected sign</i>
<i>Qual_Gov</i>	Quality of governance, expressed through the number of the university board of directors	H3	–
<i>Fin_info</i>	Financial information about profitability, expressed through the ratio between current revenues and current expenses	H4	+
<i>Soc_resp</i>	Social Responsibility, expressed as a dummy variable which is equal to 1 if universities have implemented evaluation quality systems, 0 otherwise	H5	+
<i>Age</i>	Age of Universities, expressed as years between 2012 and the foundation of each University	Control variable	–

#### 4 Results

Table 2 shows information disclosed by Italian universities through their websites.

Focusing on each specific index calculated, it is worth considering that Italian universities take specific note of items concerning research activities, especially PRIN (73%), spin-offs (84%) and patents (67%). Information concerning publications shows an opposite result (53%), probably because researchers have to upload their publications in a web-area that is reserved to the MIUR (i.e., it is not open to the general public).

As expected, Italian universities widely disclose items concerning teaching activities. Table 2 shows similar results about governance. All the universities of our sample disclose the composition of both the academic senate as well as the board of directors.

It is also worth considering that Italian universities disclose a low amount of financial information. Taking into account that the budget represents the main document in a commitment-based budgetary accounting systems (as in the Italian context), it is strange that the budgets are disclosed on the websites only in 56% of cases. Items relating to social responsibility (except the item concerning the implementation of evaluation quality systems) are inadequately disclosed. Only 18% provide a report concerning policies on environmental sustainability, while only 29% provide a complete social responsibility report. Finally, Italian universities pay great attention to interactivity with users.

Table 3, which shows the descriptive statistics of both the global disclosure index and disclosure indices concerning each area of interest, confirms these results. The highest average values refer to research and teaching activities, the main institutional activities of universities, as well as governance structure and interactivity with users. However, the mean and median values of the global disclosure index are about 69%, highlighting that, on average, the level of disclosure is quite satisfactory.

In order to investigate the disclosure level determinants, first of all we need to understand if there are some multicollinearity problems among the independent variables (Chavent et al., 2006; Moore and Buzby, 1972; Singhvi and Desai, 1971). This problem can be solved by either adopting a correlation matrix (or calculating the variance inflation factor) for each variable (Chau and Gray, 2002; Haniffa and Cooke, 2002; Ho and Wong,

2001; Owusu-Ansah, 1998; Patton and Zelenka, 1997), which expresses the degree to which each explanatory variable is explained by other explanatory variables.

**Table 2** Information disclosed through the university websites

<i>Variables</i>	<i>Frequency</i>	<i>Percentage</i>
a Research		
National research projects (PRIN) subsidies by the Ministry of Higher Education	40	73%
Spin-offs	46	84%
Patents	37	67%
Publications (articles, books, book chapters)	29	53%
b Teaching activities		
Adhesion to 'Almalaurea'	45	82%
Graduates in the set time	43	78%
Graduates who find jobs within a year after graduation	43	78%
Average degree score	44	80%
Online registrations	49	89%
Student grants	44	80%
PhD courses	55	100%
Masters	55	100%
Number of faculties	55	100%
Number of enrolled students	33	60%
c Governance		
Composition of the academic senate	55	100%
Composition of the administrative board (board of directors)	55	100%
Delegates of the chancellor	42	76%
Existence of an ethics code	51	93%
d Financial information		
Budget	31	56%
Budget of the last two years	30	55%
Long-term budget	22	40%
Financial statements	33	60%
Financial statements of the last two years	26	47%
Audit reports	22	40%
e Social responsibility		
Complete social responsibility report	16	29%
Partial social responsibility report	5	9%
Policies on environmental sustainability	10	18%
Use of alternative energy sources (e.g., solar energy)	7	13%
Implementation of evaluation quality systems	42	76%

**Table 2** Information disclosed through the university websites (continued)

<i>Variables</i>	<i>Frequency</i>	<i>Percentage</i>
f Interactivity with users		
Internal search engine	50	91%
Web map/table of contents	43	78%
Access and link to information on libraries	51	93%
Access and link to information on social and cultural activities	34	62%
Website in English	48	84%

**Table 3** Descriptive statistics

	<i>Disclosure indices</i>						
	<i>Global</i>	<i>Research</i>	<i>Teaching activities</i>	<i>Governance</i>	<i>Financial information</i>	<i>Social responsibility</i>	<i>Interactivity with users</i>
Mean	0.692	0.705	0.835	0.927	0.503	0.295	0.815
1st quartile	0.600	0.500	0.682	1.000	0.167	0.200	0.800
Median	0.686	0.750	0.909	1.000	0.500	0.200	0.800
3rd quartile	0.771	1.000	1.000	1.000	0.833	0.400	1.000
St. dev.	0.115	0.225	0.172	0.142	0.351	0.221	0.203
Min	0.429	0.000	0.455	0.500	0.000	0.000	0.000
Max	0.914	1.000	1.000	1.000	1.000	0.800	1.000

Generally, the values of the correlation coefficients exceeding 0.8 are interpreted as indicating significant multicollinearity problems. As illustrated by Table 4, the correlation coefficients are well below this threshold (only in the case of the relationship between size and complexity the coefficient is 0.6), with it being possible to include all the variables in the following regression model:

$$DI = \alpha_1 + \beta_1 \text{Research}_i + \beta_2 \text{Complexity}_i + \beta_3 \text{Size}_i + \beta_4 \text{Qual\_Gov}_i + \beta_5 \text{Fin\_info}_i + \beta_6 \text{Soc\_resp}_i + \beta_7 \text{Age}_i + \varepsilon_1.$$

**Table 4** Correlation matrix (two-tailed critical value at a 5% level: 0.2656)

	<i>Research</i>	<i>Complexity</i>	<i>Size</i>	<i>Qual_Gov</i>	<i>Profitability</i>	<i>Soc_Resp</i>	<i>Age</i>
<i>Research</i>	1						
<i>Complexity</i>	0.0086	1					
<i>Size</i>	0.0340	0.6686	1				
<i>Qual_Gov</i>	-0.4309	0.3952	0.2235	1			
<i>Profitability</i>	-0.1281	-0.2062	0.0217	0.1066	1		
<i>Soc_Resp</i>	0.0642	-0.0564	0.0729	0.0195	0.1539	1	
<i>Age</i>	0.1548	0.5887	0.4811	0.0751	-0.2032	0.1951	1

Table 5 shows the regression results.

**Table 5** Regression results

	<i>Coefficients</i>	<i>Std error</i>	<i>Stat t</i>	<i>p-value</i>
Intercept	0.35784	0.197721	1.8098	0.07672*
Research	-4.94778	6.15459	-0.8039	0.42549
Complexity	0.0868403	0.0391203	2.2198	0.03129*
Size	0.0085603	0.0228892	0.3740	0.71010
Qual_Gov	-0.00125959	0.00246306	-0.5114	0.61147
Profitability	-0.00389352	0.0748017	-0.0521	0.95871
Soc_Resp	0.145458	0.0311514	4.6694	0.00003***
Age	-2.23131e-05	5.44309e-05	-0.4099	0.68372
R <sup>2</sup>	0.411485			
Adjusted R <sup>2</sup>	0.323834			
F	4.694579			0.000471
No. observations	55			

Note: \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

R-square and Adjusted R-square are respectively 0.411 and 0.323, explaining a sufficient part of the total variability of the phenomenon investigated.

The coefficient concerning research variable is not significant, thus we cannot accept the first hypothesis about the link between research and the level of disclosure of Italian universities. This unexpected result is probably due to the great reduction in funds assigned by the MIUR and, consequently, in the limited number of PRIN (our measure of research performance) financed.

The results regarding size are not consistent with previous evidence concerning universities (Alvarez et al., 2011; Gordon et al., 2002), while the complexity coefficient is significant at 5% level. However, size and complexity express a similar phenomenon (the number of students indicates size, the number of faculties denotes complexity), with it being in part interchangeable. Nevertheless, we can accept only H2a, refusing H2b.

The coefficient concerning governance is not significant. From a statistical perspective, this means that the variable does not influence the quantity of information disclosed via the websites, thus we cannot accept the third hypothesis. This outcome might be explained in light of the perceived mandatory nature of this kind of information. As Table 2 shows, all the universities of our sample disclose information concerning the composition of both the academic senate as well as the administrative board. However, the negative sign of the coefficient is coherent with our expectations (lean management is more inclined to disclose information).

The coefficient concerning financial information is not statistically significant, in contrast with different studies (Alvarez et al., 2011; Christiaens, 1999; Laswad et al., 2005) that have assumed a positive relationship between profitability and disclosure. This finding is probably due to the inadequate level of disclosure about financial information, as Table 2 illustrates. Thus, we cannot accept the fourth hypothesis.

In line with our expectations, the coefficient concerning social responsibility is positive and it is statistically significant (at 1% level), confirming the fifth hypothesis, according to which universities that pay greater attention to this topic, disclose more

information on their websites compared with their less socially responsible counterparts. Overall, this outcome emphasises the increasing strategic relevance of this variable.

Finally, the coefficient concerning age (our control variable) is not significant, thus from a statistical point of view it does not influence the disclosure index. Nevertheless, the negative sign of the coefficient means that younger universities are more dynamic and more incline to disclose information compared with their older counterpart, as we expected.

## 5 Conclusions

Universities have to improve their relationship with stakeholders, especially students. In a more general perspective, this is due to a wide approach towards an increase in transparency and accountability of public organisations, to which citizens ask for reliable information about their activities and performance.

In the case of public universities, this general movement is emphasised by their role within society, on the grounds that they create knowledge, educating future generations (Zumeta, 2011). Furthermore, the recent law approved by the Italian Government has stressed the separation between ‘political steering’ and ‘administrative rowing’ (Braun and Merrien, 1999). On the one hand, the MIUR has to ‘steer at a distance’, defining standard criteria and parameters of quality about research, teaching activities and financial performance, while monitoring the results achieved. On the other hand, each university can freely define its own objectives as well as the way to pursue them, even though it has to comply with the above-mentioned parameters. This renewed environment is creating competition among universities both in receiving funds from the MIUR (as well as from private firms and foundations) and in recruiting students.

Consequently, universities need to provide reliable and well-timed information about their main activities, especially research, teaching and social responsibility, coherently with the special importance they play for society. The main findings of our study show that these variables are significant, helping us to explain the disclosure level of universities websites.

Our paper has tried to contribute to the literature concerning disclosure by adopting an extensive approach, both by dealing with public universities (while previous literature has mainly analysed private entities) as well as by focusing on information disclosed via websites (while previous research has dealt with information disclosed through financial statements).

Moreover, the paper has tried to provide evidence about the impetus for the shift towards public accountability systems concerning public universities (and, more generally, public schools), which do not refer only to the political level (the MIUR) and the educational establishment but also to the students as well as, in a broader sense, the community. Following the Burke’s framework (cited by Frølich, 2011), this means that universities have to pay attention to the upward, downward and outward accountability, which refer respectively to political level, students and general public.

In this perspective, accountability begins to shift from inputs to outputs and websites are one of the main sources of information through which stakeholders can monitor both. Due to accountability systems seeming to remain hierarchical in nature (Karsten et al., 2010), horizontal forms of accountability, in which the public is a significant element, are

gaining importance and university managements have to increase accountability in relation to the students and the general public.

Our study could be improved firstly by comparing both public and private Italian universities as well as foreign universities. A second possible improvement could be the analysis of not only the quantity of information disclosed but also its quality, through a more detailed, in-depth analysis.

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## Appendix

### *List of Italian universities analysed and URLs of their websites*

<i>N.</i>	<i>University</i>	<i>URLs</i>
1	University of Bari	<a href="http://www.uniba.it">http://www.uniba.it</a>
2	Polytechnic University of Bari	<a href="http://www.poliba.it">http://www.poliba.it</a>
3	University of Basilicata	<a href="http://www.unibas.it">http://www.unibas.it</a>
4	University of Bergamo	<a href="http://www.unibg.it">http://www.unibg.it</a>
5	University of Bologna	<a href="http://www.unibo.it">http://www.unibo.it</a>
6	University of Brescia	<a href="http://www.unibs.it">http://www.unibs.it</a>
7	University of Cagliari	<a href="http://www.unica.it">http://www.unica.it</a>
8	University of Calabria	<a href="http://www.unical.it">http://www.unical.it</a>
9	University of Cassino	<a href="http://www.unicas.it">http://www.unicas.it</a>
10	University of Catania	<a href="http://www.unict.it">http://www.unict.it</a>
11	University 'Magna Graecia' of Catanzaro	<a href="http://www.unicz.it/">http://www.unicz.it/</a>
12	University 'G. d'Annunzio' of Chieti-Pescara	<a href="http://www.unich.it">http://www.unich.it</a>
13	University of Ferrara	<a href="http://www.unife.it">http://www.unife.it</a>
14	University of Firenze	<a href="http://www.unifi.it">http://www.unifi.it</a>
15	University of Foggia	<a href="http://www.unifg.it">http://www.unifg.it</a>
16	University of Genova	<a href="http://www.unige.it">http://www.unige.it</a>
17	University of Insubria Varese-Como	<a href="http://www.uninsubria.it">http://www.uninsubria.it</a>
18	University of Macerata	<a href="http://www.unimc.it">http://www.unimc.it</a>
19	University of Messina	<a href="http://www.unime.it">http://www.unime.it</a>
20	University of Milano	<a href="http://www.unimi.it">http://www.unimi.it</a>
21	University of Milano-Bicocca	<a href="http://www.unimib.it">http://www.unimib.it</a>
22	Polytechnic University of Milano	<a href="http://www.polimi.it">http://www.polimi.it</a>
23	University of Modena e Reggio Emilia	<a href="http://www.unimo.it">http://www.unimo.it</a>
24	University of Molise	<a href="http://www.unimol.it">http://www.unimol.it</a>
25	University of Napoli 'Federico II'	<a href="http://www.unina.it">http://www.unina.it</a>
26	Second University of Naples	<a href="http://www.unina2.it">http://www.unina2.it</a>

*List of Italian universities analysed and URLs of their websites (continued)*

<i>N.</i>	<i>University</i>	<i>URLs</i>
27	University of Naples 'Parthenope'	<a href="http://www.uniparthenope.it">http://www.uniparthenope.it</a>
28	University of Naples 'L'Orientale'	<a href="http://www.iuo.it">http://www.iuo.it</a>
29	University of Padova	<a href="http://www.unipd.it">http://www.unipd.it</a>
30	University of Palermo	<a href="http://www.unipa.it/">http://www.unipa.it/</a>
31	University of Parma	<a href="http://www.unipr.it">http://www.unipr.it</a>
32	University of Pavia	<a href="http://www.unipv.it">http://www.unipv.it</a>
33	University of Perugia	<a href="http://www.unipg.it">http://www.unipg.it</a>
34	University of Piemonte Orientale 'Amedeo Avogadro'	<a href="http://www.unipmn.it/">http://www.unipmn.it/</a>
35	University of Pisa	<a href="http://www.unipi.it">http://www.unipi.it</a>
36	Polytechnic University of Marche	<a href="http://www.univpm.it">http://www.univpm.it</a>
37	University 'Mediterranea' of Reggio Calabria	<a href="http://www.unirc.it">http://www.unirc.it</a>
38	University of Roma 'La Sapienza'	<a href="http://www.uniroma1.it">http://www.uniroma1.it</a>
39	University of Roma 'Tor Vergata'	<a href="http://www.uniroma2.it">http://www.uniroma2.it</a>
40	University of Roma Tre	<a href="http://www.uniroma3.it">http://www.uniroma3.it</a>
41	University of Salento	<a href="http://www.unile.it">http://www.unile.it</a>
42	University of Salerno	<a href="http://www.unisa.it">http://www.unisa.it</a>
43	University of Sannio	<a href="http://www.unisannio.it">http://www.unisannio.it</a>
44	University of Sassari	<a href="http://www.uniss.it">http://www.uniss.it</a>
45	University of Siena	<a href="http://www.unisi.it">http://www.unisi.it</a>
46	University of Teramo	<a href="http://www.unite.it">http://www.unite.it</a>
47	University of Torino	<a href="http://www.unito.it">http://www.unito.it</a>
48	Polytechnic University of Torino	<a href="http://www.polito.it">http://www.polito.it</a>
49	University of Trieste	<a href="http://www.units.it">http://www.units.it</a>
50	University of Tuscia - Viterbo	<a href="http://www.unitus.it">http://www.unitus.it</a>
51	University of Udine	<a href="http://www.uniud.it">http://www.uniud.it</a>
52	University of Urbino 'Carlo BO'	<a href="http://www.uniurb.it">http://www.uniurb.it</a>
53	University 'Ca' Foscari' of Venezia	<a href="http://www.unive.it">http://www.unive.it</a>
54	University 'IUAV' of Venezia	<a href="http://www.iuav.it">http://www.iuav.it</a>
55	University of Verona	<a href="http://www.univr.it">http://www.univr.it</a>