

Article

The Antecedents of Transparency of Italian Public Entities: An Empirical Analysis in Universities and Public Research Institutes

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Abstract: Transparency within universities and public research institutes is an element of significant relevance in the Italian context. Over the years, the need for greater transparency has prompted the legislator to regulate transparency obligations in order to ensure a minimum level of information disclosure. Despite the normative obligation, Italian universities and public research institutes provide different levels of information. This circumstance requires an empirical analysis aimed at understanding the different levels of transparency of Italian universities and public research institutes, and the factors that can influence the amount of information disclosed. The results show a positive impact of the size and the internationalization on the level of the transparency of these institutions.

Keywords: transparency; universities; public research institutes; information disclosure; public administration



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1. Introduction

In light of the corruption and maladministration scandals that have affected the public sector, demands and pressures from stakeholders have increased to achieve greater transparency (Vitolla et al. 2019a, 2019b, 2020a; García-Sánchez et al. 2020; Raimo et al. 2020a, 2020b, 2021a; Salvi et al. 2020, 2021). These pressures have prompted policy makers to regulate aspects such as accountability and transparency in public administration, highlighting them as aspects of fundamental importance for the evolution of public administration functions (Kass 2005; Kim et al. 2005; Justice et al. 2006; Detlor et al. 2013; Gandía et al. 2016) and as tools to bridge an information gap related to non-financial information (Greiling et al. 2015; Fusco and Ricci 2019). Specifically, in the large pool of public administrations, the problems inherent to accountability and transparency also affect universities and public research institutes (Hordern 2013; Middlehurst 2013; Parry 2013; Rowlands 2013; Taylor 2013a, 2013b). In fact, they play a fundamental role as promoters of knowledge and innovation, and therefore are subject to growing pressures from stakeholders, which have led policy makers to intervene by imposing obligations relating to the dissemination of information (Daglienè and Mykolaitienė 2015; Romolini et al. 2015). In particular, universities and public research institutes are required to provide more information related to the governance structure and internal processes (Flórez-Parra et al. 2014). To this end, they provide documents, statistical data, and information relating to people, activities, projects, structures, and outputs of the educational, scientific, economic, and cultural organizations.

In the Italian context, the disclosure of information for public bodies is imposed by law, precisely by Legislative Decree 33/2013, also called the Transparency Decree, subsequently revised in 2016. These legislative interventions ensure a minimum level of information and push public bodies to provide information about different areas of public management in a particular section of their site called “Amministrazione trasparente”. These interventions also involved universities and public research institutes, which are called upon to provide

information on resources, management, and performance. This study puts attention on this type of disclosure due to the fact that it is mandatory and innovative because it presents different elements compared to other kinds of disclosures. The elements that compose this type of disclosure are sections imposed by law which have to be filled out. In particular, this type of disclosure includes financial, economic, and governance aspects and information of public interests. However, despite the regulatory intervention, universities and public research institutes provide information differently. This circumstance requires academic studies aimed at examining the different levels of transparency of Italian universities and public research institutes. Despite the relevance of the topic, previous studies have paid little attention to the transparency of Italian universities and public research institutes, and to the factors that can influence the amount of information disseminated. In this regard, one of the few studies is conducted by [Rossi et al. \(2018\)](#) that examined the disclosure of the intellectual capital of Italian universities. However, the absence of contributions aimed at examining the transparency relating to the obligations under the Transparency Decree is evident. This study aims to fill this gap by examining the amount of information disclosed by universities and public research institutes, and the factors that can influence this level of transparency. In particular, the study focuses on the analysis of the amount of information contained within the “Amministrazione trasparente” section of the websites of the individual universities and public research institutes. The level of information transparency is measured by a transparency index calculated by the Agency for Digital Italy. The choice of an index that examines the presence or absence of information in specific sections of the website aims to reduce the problems associated with the subjectivity of evaluation. In the context of the different determinants, this study focuses on the basic characteristics of universities and public research institutes related to the profile and organizational structure. In particular, it examines the impact of age, size, internationalization, and complexity on the level of transparency.

To this end, it presents the following structure: Section 2 presents the literature review, while Section 3 presents the hypotheses development. Section 4 shows the research methodology, while Section 5 presents and discusses the results. Finally, Section 6 draws the conclusions.

2. Literature Review

Legitimacy theory is one of the most broadly used theories in the sphere of public sector disclosure ([Campbell 2000](#); [Deegan 2002](#); [Patten 2002](#); [Lanis and Richardson 2013](#); [Fernando and Lawrence 2014](#); [Crane and Glozer 2016](#); [Montecchia et al. 2016](#); [Raimo et al. 2021b](#)). In this setting, legitimacy theory focuses on the interaction between organization and communities. During the years, the academic literature has supplied different definitions. In particular, [Suchman \(1995, p. 574\)](#) treats legitimacy as “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”. Legitimacy theory is framed in two different perspectives: institutional and organizational. The first perspective drives the organization to comply with isomorphism to the social norms and value ([Meyer and Rowan 1977](#); [DiMaggio and Powell 1983](#); [Zucker 1987](#)). The second perspective wants to guarantee perfect symmetry between social values ([Vitolla et al. 2021](#)) and organization strategies, as well as the respect for the rules to behave in conformity with the context in which the organizations operate ([Dowling and Pfeffer 1975](#); [Ashforth and Gibbs 1990](#); [Lindblom 1994](#); [Woodward et al. 1996](#)). In this line, universities’ transparency is a fundamental element to manage the organizational legitimacy on an ongoing basis. Indeed, universities can disclose information to warrant the practices carried out and to comply with the social standards imposed by the context. Universities can use disclosure as a tool to reduce the pressure laid down by social settings.

The determinants of the level of information disclosed by universities represent a widely debated topic in the scientific literature ([Coy and Dixon 2014](#); [Maingot and Zeghal](#)

2008). The contributions in the literature have mainly examined intellectual capital disclosure, sustainability disclosure, and corporate governance disclosure.

Concerning the first type of disclosure, [Bezhani \(2010\)](#) analyzed the intellectual capital disclosure within the annual reports of 30 British universities. The results showed the presence of numerous information related to the quality and research activity. [Low et al. \(2015\)](#) reviewed annual reports from 90 UK, New Zealand, and Australian universities over a 3-year time horizon. The results showed a significant presence of information relating to intellectual capital. In this sense, [Secundo et al. \(2015\)](#) identified intellectual capital disclosure as a useful tool to improve the management and strategy of universities. Furthermore, [Ramírez et al. \(2016\)](#) conducted questionnaires to 1164 members of the social councils of Spanish universities. The results of this study showed the fundamental importance of disseminating information on intellectual capital for improving the growth and competitiveness of universities. [Rossi et al. \(2018\)](#) examined the websites of 58 Italian universities. The results of the study showed the positive impact of factors such as internationalization, internet visibility, and the complexity of the university on intellectual capital disclosure. Similarly, [Ramírez et al. \(2019\)](#) analyzed the websites of 50 Spanish universities. The results of this study showed a significant impact of internationalization on the disclosure of information relating to intellectual capital. [Nicolò et al. \(2021b\)](#) examined the intellectual capital disclosure within 59 Italian public universities. The results showed a significant impact on university performance, board size, and board independence.

Concerning the second type of disclosure, [Nejati et al. \(2011\)](#) analyzed the level of information about the sustainability disclosure of the 10 most important universities in the world. The results showed a high level of online disclosure of CSR activities, such as work practices, fair operating practices, consumer information, human rights, and the environment. In this perspective, [Fonseca et al. \(2011\)](#) examined the sustainability reports of the 25 largest Canadian universities, focusing on the indicators of the Global Reporting Initiative (GRI). The results showed a very low level of disclosure of information on sustainability performance. In line with this, [Ricci \(2013\)](#) explored the sustainability reports of 20 Italian universities. The results highlighted the negative impact of the discontinuity in the preparation and publication of sustainability reports by universities on the disclosure of information relating to sustainability disclosure. Other scholars have explored the effect of the size and age of universities on the level of sustainability information disclosed. These studies highlighted a positive impact of both size ([Gordon et al. 2002](#); [Gallego-Álvarez et al. 2011](#); [Ramírez and Tejada 2019](#); [Aversano et al. 2020](#)) and age ([Gallego-Álvarez et al. 2011](#); [Ruíz Lozano and Valencia 2016](#); [Sariene et al. 2018](#)). Furthermore, [Gamage and Sciulli \(2017\)](#) examined the annual reports of five Australian universities. The results of this study show a high level of disclosure of information related to sustainability. Similarly, [Trireksani et al. \(2021\)](#) analyzed the sustainability disclosure within the documents and websites of 37 Australian universities. The results of this study showed a low level of disclosure of social and environmental information compared to financial information. In connection with the sustainability disclosure, it is important to underline the positive impact of Sustainable Development Goals on the level of information provided by universities. In fact, SDGs are important to increase sustainable strategies and awareness on human rights ([Cosma et al. 2020](#)). Specifically, this topic has played a fundamental role in institutional fields, such as universities, on the disclosure of information as a part of sustainability practices. In this way, [Saha et al. \(2021\)](#) analyzed the determinants of carbon emission disclosure in the annual reports of UK Higher Education Institutes and they found a positive relationship between these information and the SDGs. In light of this, the mission of the SDGs, with respect to education, is to gain equitable and inclusive education for everyone ([Owens 2017](#)).

Concerning the third type of disclosure, [Al-Khalifa \(2014\)](#) analyzed the websites of 35 Arab universities. The results of the study highlighted the positive impact of information relating to teaching staff on the disclosure of corporate governance. In addition, [Bisogno et al. \(2014\)](#) examined the importance of corporate governance disclosure through an analysis of Italian public universities. This study showed the positive impact of complexity

on the disclosure of this type of information. Flórez-Parra et al. (2014) and Garde Sanchez et al. (2020) analyzed corporate governance disclosure within 200 universities in the Academic Ranking of World Universities (ARWU), while Flórez-Parra et al. (2017) did the same within Colombian universities. The results of these studies showed a positive impact of members of governance on the level of information disclosure of universities. In the Spanish context, on the other hand, Ramírez and Tejada (2019) analyzed the level of dissemination of information about corporate governance through questionnaires and surveys submitted to members of the social councils of Spanish universities.

Beyond the previous types of disclosure, Gallego-Álvarez et al. (2011) explored different types of disclosed information about financial, social, and governance aspects. The authors examined the websites of 70 Spanish universities. The results of this study showed a positive impact of the size and internationality of the university on information transparency. Although the studies have examined the determinants of different types of disclosure, the absence of contributions aimed at examining the factors capable of influencing the level of information required by the Transparency Decree is evident. Furthermore, there are only very few existing studies aimed at examining the transparency of Italian universities and public research institutes.

Table 1 includes a summary of previous academic studies.

Table 1. Previous academic studies.

Disclosure	Authors	Sample	Results
Intellectual capital disclosure	Bezhani (2010)	Annual reports from 30 British universities	Numerous information about quality and research activities
	Low et al. (2015)	Annual reports from 90 UK, New Zealand, and Australian universities	Numerous information about intellectual capital
	Ramirez et al. (2016)	1164 questionnaires	Intellectual capital disclosure affects the growth and competitiveness of universities
	Rossi et al. (2018)	Websites of 58 Italian universities	Internationalization, internet visibility, and complexity have a positive impact on intellectual capital disclosure
	Ramirez et al. (2019)	Websites of 50 Spanish universities	Internationalization has a positive impact on intellectual capital disclosure
	Nicolò et al. (2021b)	59 Italian universities	University performance, board size, and board independence have a positive impact on intellectual capital disclosure
Sustainability disclosure	Nejati et al. (2011)	10 most important world's universities	High level of disclosure of CSR information
	Fonseca et al. (2011)	25 largest Canadian universities	Low level of disclosure of sustainability information
	Ricci (2013)	Sustainability reports of 20 Italian universities	Discontinuity to disclose sustainability information
	Gordon et al. (2002); Gallego-Álvarez et al. (2011); Ramírez and Tejada (2019); and Aversano et al. (2020)	Spanish universities	University size has a positive impact on sustainability disclosure
	Gallego-Álvarez et al. (2011); Ruíz Lozano and Valencia (2016); and Sariene et al. (2018)	Spanish universities	University age has a positive impact on sustainability disclosure
	Gamage and Sciulli (2017)	Annual reports from five Australian universities	High level of disclosure of sustainability information
	Trireksani et al. (2021)	Sustainability reports of 37 Australian universities	Low level of disclosure of social and environmental information

Table 1. Cont.

Disclosure	Authors	Sample	Results
Corporate governance disclosure	Al-Khalifa (2014)	Websites of 35 Arab universities	Teaching staff have a positive impact on corporate governance disclosure
	Bisogno et al. (2014)	Italian public universities	Complexity has a positive impact on corporate governance disclosure
	Flórez-Parra et al. (2014) and Garde Sanchez et al. (2020)	200 universities in Academic Ranking of World Universities	Members of governance have a positive impact on corporate governance disclosure
	Flórez-Parra et al. (2017)	Colombian universities	Members of governance have a positive impact on corporate governance disclosure
	Ramírez and Tejada (2019)	Questionnaire and surveys to the members of the social councils of Spanish universities	Corporate governance disclosure increases transparency
Other types of disclosure	Gallego-Álvarez et al. (2011)	70 Spanish universities	University size and internationality have a positive impact on information transparency

3. Hypotheses Development

In the context of the different types of determinants, this study examines the impact of the following factors: age, size, internationalization, and complexity. The choice of these variables is linked to the previous studies because the researchers investigated these factors as relevant drivers of transparency levels of universities and public research institutes.

The age of universities and public research institutes has been identified by academic literature as a first element capable of influencing the level of transparency (Gallego-Álvarez et al. 2011; Sariene et al. 2018). In this regard, in light of the growing demands for efficiency, sustainability, and transparency (Ruíz Lozano and Valencia 2016), the longest-running public bodies are called upon to use the dissemination of information as a tool capable of increasing the visibility of their actions and a differentiation strategy (Sariene et al. 2018). These circumstances could also concern the longest-running universities and public research institutes, which could exploit disclosure to ensure greater visibility for their actions and differentiate themselves from competitors. Long-lived universities may also have greater experience concerning the collection and representation of information (Garde Sánchez et al. 2013), and may have well-established policies and practices (Garde Sanchez et al. 2021) capable of promoting a prompt response to the disclosure obligations envisaged by the new regulations. From an empirical point of view, the academic literature agrees on the positive impact of age on the level of information disseminated by universities (Banks et al. 1997; Murias et al. 2008; Gallego-Álvarez et al. 2011; Católico 2012; Garde Sánchez et al. 2013). Therefore, in light of the broad theoretical and empirical support, it is possible to formulate the following hypothesis.

Hypothesis 1 (H1). *The level of transparency is positively influenced by the age of the universities and public research institutes.*

The size of universities and public research institutes has been identified by the academic literature as another factor capable of influencing the level of transparency. Larger public and private organizations are usually exposed to greater public scrutiny and receive more pressure from stakeholders (García-Sánchez et al. 2013, 2021a, 2021b, 2021c; Raimo et al. 2019, 2020c; Vitolla et al. 2019c, 2020b; Nicolò et al. 2021a), and therefore are required to have a greater level of transparency. Furthermore, they usually have a greater amount of monetary resources to be allocated also to the collection and dissemination of information (Sharif and Rashid 2014; Vitolla and Raimo 2018; Vitolla et al. 2018; Raimo 2021). Larger universities and public research institutes, apart from receiving greater pressure and having greater monetary resources, are more interested in disseminating information also in order to maintain their image for their wide audience. From an empirical point of view, the academic literature agrees on the positive impact of the dimension on the level of information disseminated by universities (Gordon et al. 2002; Gallego-Álvarez et al. 2011;

Aversano et al. 2016; Ramírez and Tejada 2019). Therefore, in light of the broad theoretical and empirical support, it is possible to formulate the following hypothesis.

Hypothesis 2 (H2). *The level of transparency is positively influenced by the size of universities and public research institutes.*

The internationalization of universities and public research institutes has also been identified by the academic literature as a factor capable of influencing the level of transparency. Internationalization represents an increasingly important element for universities and public research institutes (Gallego-Álvarez et al. 2011). According to Opoku et al. (2008), internationalization is strongly related to the reputation of universities and public research institutes, as a better reputation generates a competitive advantage. They must maintain or develop a good image to create a competitive advantage in an increasingly competitive market (Parameswaran and Glowacka 1995; Ivy 2001; Gallego-Álvarez et al. 2011). In this regard, universities could disclose more information in order to attract new foreign students for whom the website is the main source for learning about the organization, the activities carried out, the services offered, and the financial conditions of the universities. In fact, websites play a highly instrumental role in internationalization because a high level of online information disclosure allows for research institutions to be better known abroad (Gallego-Álvarez et al. 2011). The greater attention to transparency may mainly concern universities that already have a large pool of foreign students because they are strongly interested in maintaining their attractiveness abroad (Gallego-Álvarez et al. 2011). From an empirical point of view, the academic literature agrees on the positive impact of the degree of internationalization on the level of information disseminated by universities (Gallego-Álvarez et al. 2011; Rossi et al. 2018; Ramírez and Tejada 2019). Therefore, in light of the broad theoretical and empirical support, it is possible to formulate the following hypothesis.

Hypothesis 3 (H3). *The level of transparency is positively influenced by the degree of internationalization of universities and public research institutes.*

The complexity of universities and public research institutes has been identified by the academic literature as another factor capable of influencing the level of transparency. Greater complexity, in terms of departments, increases the number of stakeholders interested in learning about the organization, the activities carried out, and the services offered by universities and public research institutes, and therefore may require greater transparency (Gallego-Álvarez et al. 2011). Furthermore, greater complexity could increase the number of information potentially disclosable by universities and public research institutes on their website (Gallego-Álvarez et al. 2011). Finally, very often, greater complexity is associated with greater availability of monetary resources that could be used by universities and public research institutes also for the collection and representation of information. From the empirical point of view, Rossi et al. (2018) examined the relationship between complexity and information disclosure by universities and found a significant relationship. Therefore, in light of the broad theoretical support, it is possible to formulate the following hypothesis.

Hypothesis 4 (H4). *The level of transparency is positively influenced by the complexity of universities and public research institutes.*

4. Materials and Methods

4.1. Sample and Variables

The sample of this study was made up of 69 Italian universities and public research institutes. In particular, the sample included 63 universities and 6 public research institutes. To identify the sample, we referred to the “Bussola della Trasparenza” site (<http://bussola>).

magellanopa.gov.html accessed on 3 September 2020), which represents the tool made available by MagellanoPA (the Knowledge Management System for Public Administration devised by the Minister for Simplification and the public administration) for the verification of the obligations related to transparency for the public administration. The regulatory obligations for public administrations regarding transparency are governed by Legislative Decree 33/2013, modified by Legislative Decree 97/2016, standardizing the methods of publishing content within the institutional sites of the public administrations.

Through the “Bussola della Trasparenza” platform, it is possible to examine and monitor the information entered by the various Italian universities and public research institutes. Within the sample, there are only Italian universities and public research institutes that have communicated a valid site to the “Indice dei domicili digitali della Pubblica Amministrazione e dei Gestori di Pubblici Servizi (IPA)”.

Table 2 includes the distribution of the sample by region of belonging. The table below shows the distribution of the sample with absolute and relative frequency. In this regard, a greater concentration of universities was identified in the Lazio and Lombardy regions and a minority in the Basilicata, Liguria, Molise, and Aosta Valley regions.

Table 2. Distribution of the sample by region of belonging.

Regions	Frequencies	
	Absolute	Relative (%)
Abruzzo	4	5.8
Basilicata	1	1.45
Calabria	3	4.35
Campania	6	8.7
Emilia-Romagna	4	5.8
Friuli Venezia Giulia	3	4.35
Lazio	9	13.04
Liguria	1	1.45
Lombardy	9	13.04
Marche	3	4.35
Molise	1	1.45
Piedmont	3	4.35
Apulia	4	5.8
Sardinia	2	2.9
Sicily	3	4.35
Toscana	5	7.25
Trentino-South Tyrol	2	2.9
Umbria	2	2.9
Aosta Valley	1	1.45
Veneto	3	4.35

The dependent variable of this study is represented by the transparency index of Italian universities (TI). This indicator is identified in a score that varies in a range between 0 and 84.

Accordingly, there are 84 sections required by Legislative Decree 33/2013 and include documents, information, and data concerning the organization of the administration, the activities, and its implementation methods. These sections are divided into two levels within the “Amministrazione trasparente” list of the publication obligations in force within Annex 1 of the Legislative Decree. The levels are called sub-section level 1 (macro-families) and under-section level 2 (types of data). In light of this, the compilation of all 84 sections corresponds to the total transparency of the universities and public research institutes.

Conversely, failure to complete all sections indicates a totally non-transparent university. The scores relating to the dependent variable were collected through the “Bussola della Trasparenza”. These scores were calculated through automatic monitoring carried out based on information communicated by the Italian universities to the IPA. The data collected refer to the year 2020 and were collected in December.

The independent variables of this study are age (AGE), size (SIZE), internationalization (INTER), and complexity (COMPLEX) of universities and public research institutes.

AGE stands for the years of activity of the institution since the time it was founded. The results were collected within the websites of the individual universities and public research institutes, and the variable is the result of the difference between 2020 and the year the university was founded. SIZE represents the size of the universities and public research institutes, and has been operationalized as the natural logarithm of the total number of students enrolled. The data was collected on the website <http://ustat.miur.it/dati/didattica/italia/atenei> accessed on 3 November 2021. INTER represents the ratio between the number of foreign students enrolled in individual universities and the total number of students enrolled. The data was collected on the website <http://ustat.miur.it/dati/didattica/italia/atenei> accessed on 3 November 2021. Finally, COMPLEX represents the complexity of the university in terms of the number of departments present within the university. This data was collected on the websites of the individual universities and public research institutes.

To increase the goodness of the econometric model, some control variables were included. The added control variables are internet visibility (INTERVIS); the gender of the rector (RECGEND); and the geographical position (GEOLOC) of the universities and public research institutes.

INTERVIS was operationalized as the natural logarithm of the results of a search in “google.com” in which the exact name of the universities and public research institutes appears. RECGEND is a dummy variable that takes a value of 1 when the rector (or the director of the public research institute) is a woman and 0 in the opposite case. Finally, GEOLOC is another dummy variable that assumes the value of 1 if the university is located to the north of Italy and 0 otherwise. The data relating to INTERVIS were collected within the search engine google.com, while the data relating to the RECGEND and GEOLOC were collected within the websites of each university and public research institute.

4.2. Empirical Methods

To test the research hypotheses, this study used a multiple linear regression model. In particular, this study implemented a cross-sectional analysis due to the impossibility of carrying out a longitudinal analysis. This impossibility is related to the unavailability of data relating to the dependent variable in the years before 2020. The analysis model proposed by this study is reflected in the following equation:

$$IT = \beta_0 + \beta_1AGE + \beta_2SIZE + \beta_3INTER + \beta_4COMPLEX + \beta_5INTERVIS + \beta_6RECGEND + \beta_7GEOLOC + \varepsilon.$$

5. Results and Discussion

5.1. Descriptive Statistics of the Variables

The first part of Table 3 presents the descriptive statistics. An interesting result is represented by the mean of the dependent variable. It has an average value of 72.44, which demonstrates a high (but not yet complete) level of information transparency in universities. As for the independent variables, the AGE variable has an average of 236.04. The SIZE variable has an average value of 9.25 enrolled students and the INTER variable has an average internationalization value of 7.37. The COMPLEX variable, on the other hand, has an average value of 10.92. As for the control variables, the INTERVIS variable shows an average of 14.59. About 10% of the universities have a female rector, while about 30% of the universities are located in the north.

Table 3. Mean, standard deviation, VIF, and correlation.

Variables	Mean	S.D.	VIF	TI	Age	Size	Inter	Complex	Intervis	Recgend	Geoloc
TI	72.44	20.76		1							
Age	236.04	291.76	1.42	0.181	1						
Size	9.25	1.64	3.01	0.345 ***	0.374 ***	1					
Inter	7.37	10.03	2.81	0.057	−0.098	−0.470 ***	1				
Compl	10.92	9.37	1.83	0.229 *	0.373 ***	0.481 ***	−0.177	1			
Intervis	14.59	1.89	1.55	0.446 ***	0.261 **	0.423 ***	−0.176	0.309 ***	1		
Recgend	0.10	0.30	1.04	−0.035	−0.035	0.034	0.056	0.101	−0.031	1	
Geoloc	0.30	0.46	1.20	0.054	−0.231 *	0.045	0.131	0.039	0.085	0.090	1

Note: n = 69 and S.D. = standard deviation. *** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.

The second part of Table 3 shows the results of the correlation analysis. This analysis allows for excluding multicollinearity problems. In fact, the highest correlation coefficient, recorded between COMPL and SIZE, is equal to 0.481. In this regard, as pointed out by Farrar and Glauber (1967), problems of multicollinearity are recorded only in the presence of values that exceed ± 0.8 or ± 0.9 . Therefore, in light of this, it is possible to affirm the absence of multicollinearity problems in the interpretation of the results.

To confirm this, the variance inflation factor (VIF) was also calculated. In this regard, the highest value is 3.01, thus confirming the absence of multicollinearity problems. In fact, according to Myers (1990), there are no problems of multicollinearity in the presence of a VIF of less than 10.

5.2. Multivariate Analysis

To test the research hypotheses, this study used a multiple linear regression model. Table 4 presents the findings of the regression. The regression model allows for explaining 27.4% of the variance of the dependent variable (adjusted R^2 equal to 0.274).

Table 4. Regression model results.

Variables	Coefficient	Standard Error	p-Value	Sign
Cons	5.713	2.982	0.026	**
Age	−0.005	0.008	0.558	
Size	9.564	2.921	0.002	***
Inter	1.247	0.357	0.001	***
Complex	−0.296	0.309	0.341	
Intervis	2.243	1.409	0.089	*
Recgend	−4.760	7.176	0.510	
Geoloc	−3.737	5.064	0.463	
N	69			
Adj R^2	0.274			

*** = significant at the 1% level; ** = significant at the 5% level; and * = significant at the 10% level.

The results only partially support the hypotheses; in fact, they support two of the four hypotheses of this study.

In this regard, the results do not support Hypothesis 1 (H1). In fact, they demonstrate a non-significant relationship between the variable AGE and the variable TI. This result shows that age does not influence the amount of information disclosed by universities and public research institutes. Therefore, the findings are not in line with some factors whose affect has been proved in other geographical and political contexts, such as in England, Wales, and Northern Ireland by Banks et al. (1997), and in Spain by Murias et al. (2008), in which the age of universities is a determinant of transparency.

Hypothesis 2 (H2) is supported by the results. Indeed, they demonstrate a positive and significant relationship between the SIZE variable and the TI variable ($p = 0.002$). This result suggests that larger Italian universities and public research institutes are more likely to disclose information externally. This result can be explained by the greater pressures they are exposed to and the greater monetary resources enjoyed by universities and public research institutes. In this perspective, greater transparency can represent a way for satisfying the information needs of the wider audience of stakeholders that distinguishes the largest universities and public research institutes. This finding is in line with the results obtained in an international context, in particular in Spain by [Gordon et al. \(2002\)](#), beyond the different regulatory structure within the different countries.

Hypothesis 3 (H3) is also verified. Indeed, the results show a significant and positive relationship between the INTER variable and the TI variable ($p = 0.001$). A high degree of internationalization, in terms of the ratio between foreign students and the number of students enrolled in Italian universities and public research institutes, therefore entails wider dissemination of information or, in other words, a higher degree of transparency. This result can be explained by the desire of the more internationalized universities to maintain their attractiveness abroad. This circumstance, in fact, requires wide dissemination of information in order to inform potential foreign students about the organization, the activities carried out, and the services offered by universities and public research institutes. This finding confirms what emerges in the international scenario. In particular, in the USA context with a study made by [Parameswaran and Glowacka \(1995\)](#), the internationalization is a determinant of the transparency of universities, notwithstanding the different legislation.

Finally, Hypothesis 4 (H4) is not verified by the results. In fact, the results demonstrate a non-significant relationship between the COMPLEX variable and the TI variable. This result shows that complexity does not influence the amount of information disclosed by universities and public research institutes. Therefore, the results are not in line with some factors whose influence has been attested in other geographical and political contexts, such as in the Austrian context in which the complexity of universities is a determinant of transparency.

As for the control variables, the results show a positive and significant effect of INTERVIS on the TI variable ($p = 0.089$). This result shows that the most visible universities and public research institutes, in terms of Google searches, are more likely to disclose a wider range of information.

6. Conclusions

This study examined the factors influencing the level of transparency of Italian universities and public research institutes. The results highlight a positive and significant effect of the size and internationalization on the level of transparency of universities and public research institutes. The results also emphasize a non-significant influence of the age and complexity of universities and public research institutes.

This study contributes to the existing literature by increasing knowledge about the levels of transparency of Italian universities and public research institutes. Specifically, it represents the first study that examines the determinants of the level of information disclosed by Italian universities and public research institutes.

This study is remarkable due to its insights on mandatory requirements. Its usefulness has to be redirected to the fact that it aims at verifying the potential effects of imposing constraints in universities' and public research institutes' transparency. One must think of the consequential standardization of information which must be supplied in mandatory sections. The main peculiarity of this research is to widen the analysis on the theme in a two-fold perspective. Indeed, bureaucratic-administrative aspects are enhanced, as well as the existence of obligations according to the law in force.

The results offer important implications for universities and public research institutes. In this sense, universities should attempt to satisfy the requests of stakeholders in terms

of disclosure of information in a clear and timely manner in order to achieve a higher level of transparency. In this regard, universities and public research institutes should improve information disclosure systems through the implementation of innovative IT systems to adapt to the more complex and different organizational structures of various institutions. More specifically, the results of this study show the need for the largest and most internationalized universities and public research institutes to increase their level of transparency. For these institutions, in fact, transparency represents a means to satisfy the needs of the widest and most internationalized audiences of stakeholders, and, consequently, to obtain legitimacy.

The results also show important implications for policy makers. In fact, in addition to providing regulatory obligations for transparency, they should provide continuous monitoring of the actual amount of information disclosed by universities and public research institutes.

However, this study is not without limitations. These limitations are mainly related to the time horizon of the econometric analysis, the number of determinants examined, and the failure to consider moderation effects. Concerning the first limitation, this study conducted the analysis over a single year and therefore did not allow for investigating the changes recorded over the years about the amount of information disseminated. With regard to the second limitation, this study analyzed the impact of a limited number of factors due to the impossibility of collecting data related to other independent variables. Concerning the third limitation, this study did not consider the possible moderation effects of the variables of interest. However, these limitations do not reduce the quality of the work or undermine the interesting insights for future research. Concerning the first limitation, future studies will be able to collect the transparency indices provided by the ministerial platform year by year and then carry out a longitudinal analysis over several years. Concerning the second limitation, future research will be able to extend the number of determinants examined by administering questionnaires to universities in order to obtain additional data to be included in the econometric analysis. Finally, regarding the third limitation, future studies will be able to examine possible moderation effects.

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