

## **E-Government in the Brazilian University Context: the access of information and accounting disclosure**

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**Abstract:** Internationally, public institutions are immersed in a process of discussion about how they should disseminate information through the internet. Internet access and the necessity of transparency in public administration made the construction and management of websites an essential tool of modern public administration. In this sense, citizens could constantly assess how public managers manage the financial, economic resources, and assets of public institutions. It is important to verify if public organizations are aware of the importance of accounting information in their websites to help the accountability and control processes. This paper aims to achieve empirical evidence of e-disclosure in 59 federal Brazilians' universities and propose an index to measure and monitor the development of the disclosure of accounting information in their websites. Furthermore a multivariate regression analysis was performed to find out if there is a relationship between institutional factors and public disclosure information on the internet. We presented hypotheses regarding the relationship between an e-disclosure index and aspects related to the characteristics of the universities, efficiency, and quality. As a result we conclude the data support the hypotheses, with different levels of robustness.

**Keywords:** e-government, public accounting information, public university, transparency.

### **1. Introduction**

The social, economic, and political changes in several countries around the world have made governments improve their management systems and increase the transparency of their actions. To meet the demands and requirements of citizens, public agencies sought new and innovative management models, in addition to new management tools (Beuren et al., 2013).

In the Brazilian context, since the 1980s the legislation has been gradually evolving toward greater transparency and accessibility of public information, related to the policies of active transparency and the disclosure of administrative acts or regulations of confidentiality. These advances have transformed Brazil into an example of democracy in Latin America. The

Brazilian Constitution of 1988 was the major driver of this development by which important new laws have guaranteed access to public information and increased the responsibilities of managers dealing with public affairs.

However, we would like to highlight in this study one of the most important and the recent consolidation of Brazilian democracy, the Access to Information Act (2012) which is revolutionizing the way public agencies communicate and provide information to citizens via the internet. The main innovation of this law lies in the fact that the disclosure of information shall be made available proactively, so that public bodies can promote the dissemination of information based on public interest, regardless of requirements. Despite the innovations provided by the law on access to information, there is much to advance in the field of public transparency.

The internet has made available to the public sector an important way to communication that help the firmament of the dialogue between the government and the citizen. However, despite the benefits offered by the internet, the real use that the public bodies makes of their websites is limited by the will of the politicians and the communication strategies implemented management (Gandía & Archidona, 2008).

This study contributes to the literature in two ways. First is to contribute through empirical evidence on the information disclosed on the websites of Brazilian public universities and, second, to verify empirically what factors determine a higher or lower level of transparency. This study is not aimed at directly comparing the universities and do not make any critical analysis of the administrations of the universities studied, so only exposes a reality found in a particular moment in time and tries to explain it by institutional factors.

## **2. Literature Review**

In the last few years, accountability and the right of access to public information has become essential for the advancement of a democratic society. These initiatives aimed at supporting citizen participation, increase the confidence of governments, prevent corruption, and support the public decisions and accuracy of government actions (Bertot et al., 2010).

The current demands of society assume various technological, cultural, and administrative challenges, so that information is revealed in a quick, safe, and widely accessible manner for all stakeholders. In order to overcome these challenges, new information and communication technologies, especially the internet, are essential to provide more information and better quality public services to citizens. Many countries have adopted these new technologies as means to increase government transparency and reduce corruption (Bertot et al, 2012). Government websites can be an important communication tool in establishing relations with citizens and provide an environment to promote public participation in political processes and decision-making (Moon, 2002).

Justice, Melitski, and Smith (2006) argue that improvements in e-government initiatives occur through a continuous process of development by raising awareness of culture change and technological development. The most relevant studies on e-government explain how they developed the dissemination of information through the internet and the way in which these changes have altered the relationship between governments and their citizens, and the way that such initiatives affect citizens at the time of make their decisions, especially when they have to choose those politicians who will manage their cities (Bertot et. al., 2010; Ho, 2002; Ho & Ni, 2004; La Porte et. al., 2002; Moon, 2002; Norris & Moon, 2005; Tolbert & Mossberger, 2006; West, 2004; Wong & Welch, 2004).

West (2004) argues that e-government initiatives can increase citizens' trust in government actions, and denote that digital government has the power to transform service delivery and citizen attitudes. Likewise, Tolbert and Mossberger (2006) explain in their study, that the confidence of citizens in local government can raise through the initiatives of e-

government. More recently, Jun, Wang & Wang (2014), studied the relationship between government website usages, government's capacity for service delivery, and citizens' perception of local government transparency in China; their findings indicates that the development of government website has the potential to improve the government's image, and the citizen's perceptions of government transparency, however, the e-government in China is still at the information-provision stage, and still not the main platform for service delivery.

Relevant articles on e-government formed the basis for further studies, especially for those on disclosure of financial information, navigability/accessibility of the internet, and studies addressed to the analyze factors related to the disclosure of information, in addition, evaluation of factors that determine the disclosure of budgetary and financial information on the internet. These studies focused mainly on the dissemination of information on the website by national and local governments in several countries in America and Europe (Caba et. al., 2005, 2008; Serrano-Cinca et. al., 2009; Gandía & Archidona, 2008; Laswad et. al., 2005; Manoharan, 2013; Pina et. al., 2010; Thornton & Thornton, 2013).

With respect to universities, not many empirical studies have been published over the last five to ten years on the disclosure of information on the internet. In addition, articles published on this topic have not achieve great academic impact (Silva et. al., 2014). Most of the articles (Católico, 2012; Gallego et al., 2009, and Gordon et al., 2002) on the disclosure of financial information by universities are focused on surveys and interviews; nevertheless, almost no previous research was conducted on data published on the internet, which is a mechanism for dissemination of information very powerful and has many advantages.

### **3. Hypotheses development**

Following a literature review on e-government, we have gathered the main factors leading public institutions to disclose more information on the web through three dimensions (Serrano-Cinca et. al., 2009). The first dimension analyzed was the characteristics of the university which corresponds with the following hypotheses: wealth (hypothesis 1), size (hypothesis 2), age (hypothesis 3) and governance (hypothesis 4). The second dimension relates to efficiency aspects and with respect to cost per student (hypothesis 5) and the relationship between the number of employees and students (hypothesis 6). Finally, the third dimension is related to the quality of university (hypothesis 7). We present, for each case, its corresponding theoretical basis and the results obtained in several empirical studies.

#### **3.1. Wealth**

Ingran (1984) and Lüder (1992) observed in their study that municipalities who need more financial resources were those most divulged information. To meet this need the municipalities require better quality information and in doing so are investing resources to develop tools to better help institutions with their reporting. Caba, Rodríguez, and López (2008) explain that in the case of municipalities that need more resources, it seems consistent argument that these bodies set some conditions that would affect the area of financial disclosure, and therefore the financial information would become available to the public. Christiaens (1999) argues that the wealth should be positively associated with increased disclosure because it provides a signal of management quality. In this paper, consistently with Christiaens (1999), Ingran (1984), and Laswad, Fisher, and Oyelere (2005), we use wealth as a proxy for "universities wealth" based on their annual income. Therefore:

*H<sub>1</sub> There is a positive association between university wealth and e-disclosure.*

#### **3.2. Size**

One of the variables most used in research evaluating disclosure of information is the size of the organization (Gordon et. al., 2002). The classical theories of financial reporting provide a

positive and significant relationship between size and disclosure (Serrano-Cinca et. al., 2009). Taking into account the need for increased disclosure by large local authorities, it is expected that these entities tend to adopt an assortment of reporting methods (Laswad et. al., 2005). Torres, Pina, and Acerete (2005) state that the dissemination of information through the web is an improvement and that larger institutions have more resources to support this innovation.

Considering previous studies, it is argued that there is a positive relationship between the size of the institution and the information disclosed on the internet. Nevertheless, Ingran (1984) and Laswad, Fisher, and Oyelere (2005) found no statistically significant association between e-disclosure and government size.

Following the methodology used by Gallego, García, and Rodríguez (2009), the size variable is measured by the number of students. For this study the number of students was divided into two categories: number of undergraduate students and number of graduate students. Since this information is available and taking into account the objectives of this study, we consider it important to know how these two groups influence the disclosure of information. Research and technology transfer developed by post-graduation, are one of the most important functions developed by higher education institutions.

Following review of the literature and the theoretical arguments, sets up the following hypothesis:

*H2 There is a positive association between size and e-disclosure.*

### **3.3. Age**

Gallego, García, and Rodríguez (2009) argue that the age of the universities can influence the degree of overall and financial disclosure. Banks, Fisher, and Nelson (1997) demonstrated that older universities were found to have a greater propensity to disclose more information than the younger universities. Murias, Miguel, and Rodríguez (2008) described similar results for public Spanish universities. Católico (2012) also found a significant and positive relationship between age and e-disclosure for public Colombian universities. Based on the influence of existing empirical evidence, we propose:

*H3 There is a positive association between institution age and e-disclosure.*

### **3.4. Governance**

Several studies have sought to identify the factors that influence the disclosure of financial information, and governance aspects including the size of the governing board which was demonstrated to be significantly related to the degree of disclosure. Gallego, García, and Rodríguez (2009), and Gordon, Fisher, Malone and Tower (2002) argue that bigger boards are consistent with a positive relationship of the level of disclosure of information on the web.

According to Gordon, Fisher, Malone, and Tower (2002) the number of members on governing board of an institution could explain different levels of monitoring. Taking into account the arguments proposed in previous studies, we propose in this article the argument that a larger number of members on the boards of governance indicates a greater attention to monitoring levels. Therefore the proposition that the greater the number of members of governance bodies, the greater the level of disclosure.

By considering previous works, we present the following hypothesis:

*H4 There is a positive association between number of members on the governing board and e-disclosure.*

### **3.5. Cost per student**

In studies related to local governments, public administrators have incentives to reduce the cost of municipal debt, because in turn could reduce property taxes (Gore et. al., 2004). When the debt begins to become unsustainable and financial difficulties arise, it becomes more important

to provide greater financial transparency of public entities (Caba et. al., 2008). For this reason, studies that relate the debt of public entities to dissemination of information, suggests that there is a positive relationship between debt and disclosure of information (Caba et. al., 2008). However to support this approach, these studies use a proxy to measure the variable debt, funding costs, or funding costs per capita, and financial expenses. Furthermore, many studies that use these variables did not show significant results in relation to financial disclosure (Barber, 1983; Ingran, 1984; Christiaens, 1999)

In general, when analyzing public institutions, federal Brazilian universities do not contract debts with third parties and do not charge students monthly fees. Therefore, all the resources necessary to support the costs of education, research, and extension activities are coming from financial contributions from the central government, which consequently obtains its funds through taxes paid by citizens. Thus, in our study, we propose a variable that measures the cost per student. In this way we try to measure the degree of efficiency of universities by evaluating the average, maximum, and minimum values of this cost among them.

By following the line that quality of the administration and its efficiency in the application of resources will relate to a greater incentive to disclosure of information. We argue that a university can serve a larger number of students with the same resource as another smaller university, one can assume that its management is more efficient and would therefore be more transparent and disclose more information.

*H5 There is a negative relationship between cost per student and e-disclosure*

### **3.6. Relationship between employees and students**

Católico (2012) used the variable as the number of teachers in their study to find the factors that can influence the disclosure of financial and academic information on the web. At that time, his results showed, with some degree of significance, there was a negative relationship between the number of teachers and the dissemination of information. He justified the result by the fact that the university has a smaller number of professionals use the internet as a viable alternative in order to promote academic and financial information.

In our study, we intend to investigate the relationship between the number of students and employees. The teachers and the administrative staff has key role in the development of activities in Brazilian universities. This variable should be analyzed with caution, because a greater relationship between students and employees may demonstrate greater efficiency in academic procedures and teaching process, however, a disproportion in this indicator could identify a deficiency that may lead to an excessive number of students per employee, resulting in excessive workload, "work stress", due to excessive class hours among other factors.

*H6 Universities with higher ratio students/employees disclose more information on the web.*

### **3.7. Quality of University**

One of the factors that we see as decisive aspect for the dissemination of information on the internet was the level of quality of universities. Therefore, we use the "RUF" ranking from the year 2013, published by "Folha de São Paulo" (Brazil). One of the important factors to measure the quality of higher education institutions is its internationalization. Gallego, García, and Rodríguez (2009) argue that, the internationalization of universities have been considered as an important criterion in the evaluation of its quality. The internationalization of higher education institutions is a global reality and this implies the need for structural and technological investments, professional training, and scholarships among others things. In addition, universities must also embrace a change in culture to face the challenges arising from the internationalization actions.

Another important factor is the qualifying standard of the teaching staff, because we believe that a group of highly specialized professors could increase the index of disclosure. To this end, we work with the hypothesis that more professors with doctoral and master's at a university, it would result in greater transparency. Therefore, we also use as a quality parameter, the qualifying standard of teachers, which is found in the university management report, but it has a form of standard calculation for all of them, as determined by the Court of Audit, so it is an indicator that can be used as comparison parameter between universities, since it is standardized.

In the context of high competitiveness and pursuit of excellence, it is essential that universities are transparent and publish the most amount of information as possible on the internet by using their website as a powerful dissemination tool and a promoter of internationalization. The web can be used as a way to reach the largest possible number of stakeholders and facilitate the recruitment of students, professors, and researchers. For this, we assume that to improve the quality of the institution, a higher level of information should be disclosed.

*H7 There is a positive association between quality and e-disclosure.*

#### **4. Research Design and Methodology**

This section describes the methodology used to test the hypotheses of the study. First, the population and sample selection procedures are detailed. Then, the process to create the University Disclosure Index (UDI) is discussed. Followed by, the description of the methods by which information about the universities has been gathered. Finally, the last section specifies the model and statistical methods used to test the hypotheses – data analysis.

##### **4.1. Population and sample**

The population is defined by the 193 universities in Brazil in 2013 with a total population of 3,822,998 students (INEP, 2012). Of the 193 universities, 97 are public and the remaining 96 are private. In Brazil, public universities can be administered by central government (federal), state government or local government, depending on their legal constitution and who supports it financially.

This research has been carried out by evaluating the websites of all 59 federal Brazilian universities. We have chosen this type of institution because of their importance for Brazilian society, importance to higher education, and their existence as public bodies. The numbers of students in the federal universities represent a little more than one million of students. These elements provide a level of transparency and governance which are the minimum conditions of democracy and citizen participation within a democratic state of law.

##### **4.2. Research design**

From a methodological point of view, we have developed a score table to capture the main disclosure information by the universities with respect to accessibility and accounting information. Considering the papers written by Gandía and Archidona (2008), and Laswad, Fisher, and Oyelere (2005), our methodology for data collection involves the identification and evaluation of the outstanding features observed in the electronic sites of universities in regard to the precepts of the law on access to information and the dissemination of accounting information.

The papers of Gandía and Archidona (2008), and Laswad, Fisher, and Oyelere (2005), propose a model that investigates many aspects of information disclosure on websites of the local government, such as general, budgetary, and financial information as well as characteristics like presentation of information and navigability. To this end, Laswad, Fisher, and Oyelere (2005) examined the voluntary internet financial reporting practices of local authorities in New Zealand, and Gandía and Archidona (2008), in the Spanish local governments.

**Table 1. University Disclosure Index (UDI)**

Item		Interpretation	Score
<b>A)</b>	<b>IAI</b>	<b>Index of Access to Information</b>	<b>27</b>
<b>A1)</b>	<b>Accessibility</b>		<b>10</b>
<b>1</b>	Banner	Have link to enter "Access to Information" of the institution	1
<b>2</b>	Toolbar - Federal Government	Has the identity toolbar the federal government - Portal Brazil	1
<b>3</b>	Service letter	Own institution's service letter	1
<b>4</b>	Map of the web	Own map about the content available on the university web	1
<b>5</b>	Redirection	Information that does not appear on the site are redirected to another government site	1
<b>6</b>	FAQ	Frequently asked questions	1
<b>7</b>	Access form for solicitation	Has a link with form to request access to information	1
<b>8</b>	Classified information	Disclose if there are confidential information	1
<b>9</b>	Allows to record data in several formats	Enables recording of reports in various electronic formats (doc, pdf, xls)	1
<b>10</b>	Accessibility for disabled	Ensures the accessibility of content for people with disability	1
<b>A2) 11</b>	<b>Ombudsman office</b>	Contact for the monitoring authority or ombudsman office	1
<b>A3) 12</b>	<b>Rector agenda</b>	Presents on its website the schedule manager	1
<b>A4)</b>	<b>Institutional</b>		<b>9</b>
<b>13</b>	Organizational Structure	Organizational structure, responsibilities, main office and its occupants	1
<b>14</b>	Information to contact	Contact, address and telephone number to the public	1
<b>15</b>	Organization Chart	Presents the university organization chart	1
<b>16</b>	Statute	Displays the statute on the website	1
<b>17</b>	Internal regulations	Presents the Internal Regulation on the website	1
<b>18</b>	Academic Calendar	Publishes the academic calendar	1
<b>19</b>	Opening hours	Reports the opening hours and customer service	1
<b>20</b>	IDP	Institutional Development Plan	1
<b>21</b>	ITDP	Information Technology Development Plan	1
<b>A5)</b>	<b>Employees</b>		<b>2</b>
<b>22</b>	Public tender	Public announcements and the results of public tenders held	1
<b>23</b>	Payment of employees	Publishes the remuneration and allowances received by office occupants, or has link to provide information	1
<b>A6)</b>	<b>Contracts</b>		<b>4</b>
<b>24</b>	Bidding	Bidding made, publication of auctions, attachments and results, signed agreements and commitment notes	1
<b>25</b>	Contracts	Discloses the contracts made	1
<b>26</b>	Partnerships	Discloses list of partnerships	1
<b>27</b>	Outsourced companies	Discloses list of outsourced workers and company names to which they belong	1
<b>B)</b>	<b>ADI</b>	<b>Accounting Disclosure Index</b>	<b>20</b>
<b>B1)</b>	<b>Accounting statements</b>	Accounting statements applied to the public sector - Accounting Manual Applied to Public Sector - V (Finance Ministry)	<b>8</b>
<b>28</b>	Statement by accountant	Statement by accountant of the conformity of reports submitted	1
<b>29</b>	Budget balance sheet	Budget Execution and financial detailed and transfer of financial resources	1
<b>30</b>	Financial Statement	Revenues (Budgetary Revenues and Receipts Extra Budgetary) and expenditures (Budget Expenditure and extra budgetary Payments)	1
<b>31</b>	Balance sheet		1
<b>32</b>	Statements of equity variations	Will evidence the changes in the equity	1
<b>33</b>	Statement of cash flows		1
<b>34</b>	Explanatory notes		1
<b>35</b>	Access to the financial statements of the two or more years old	May inspect the financial statements of previous years	1
<b>B2) 36</b>	<b>Expenditures</b>	Presents expense report	1
<b>B3)</b>	<b>Auditing</b>		<b>4</b>
<b>37</b>	Internal audit	The institution has permanently constituted internal audit	1
<b>38</b>	Report of internal audit	Presents the internal audit reports	1
<b>39</b>	Audit Court report	Presents the audit court reports	1
<b>40</b>	Measures adopted	Presents the information of the measures adopted of the inspections of the audit court and internal audit	1
<b>B4)</b>	<b>Management</b>		<b>7</b>
<b>41</b>	Management Report of the Rector		1
<b>42</b>	Performance indicators		1
<b>43</b>	Management control systems	Presents a cost management control system	1
<b>44</b>	Departments	Presents results by department	1
<b>45</b>	Teaching	Presents results by teaching activity	1
<b>46</b>	Research	Presents results by research activity	1
<b>47</b>	Extension	Presents results by extension activity	1
	<b>UDI</b>	<b>University Disclosure Index</b>	<b>47</b>

This study provides an important contribution to the Brazilian disclosure literature by providing a comprehensive evaluation the current state of information available to the general public and the ability to access such information. In our study, we attempt to verify procedures that have been adopted by federal Brazilians universities in relation to their websites by taking into consideration their disclosure of accounting and general information in the face of current regulation on the access to information.

The following methodological steps were performed for the construction of the university disclosure index (**UDI**). For this, it is essential to use a specific questionnaire that covers all relevant aspects for a complete analysis of the level of disclosure of universities. Such index (Table 1) is composed of 47 items divided into ten subsections which in turn are divided into two major sections, namely, index of access to information (**IAI**), and accounting disclosure index (**ADI**). The questionnaire was performed during the months of September and October 2014.

The development of the questionnaire items whose full structure can be seen in Table 1, took into consideration the following criteria:

- 1) Access to information (IAI). This section is related to verification of adherence to aspects related to active transparency and the access to information required by law. With respect to IAI, it is the duty of the organizations and entities, independent of the request, to promote the dissemination of information of general interest in their websites. In this section twenty-seven items were observed, representing 57% of the UDI.
- 2) Accounting disclosure (ADI). The accounting index was performed by evaluating the disclosure of financial reports, expenditures, information about internal and external audits, and information related to management. In this section twenty items were observed, representing 43% of the UDI.

By completing the questionnaire, were checked all items in each of the surveyed universities, and when this item was filled, was designated note “one”, otherwise the score was “zero”. We made the choice in this study to designate a distinct weight to the two sections studied here. After reviewing the 47 questionnaire items for each university, the next step was to calculate the degree of information revealed on the websites. The disclosure index was calculated, for each university taking into consideration the items identified in Table 1. Taking into account that the disclosure index is divided into two sections, it first calculates each partial index, which is weighted to calculate the total index. By definition, both, the total and the partial index can have values ranging between “zero” and “ten”. The partial and total index was calculated as demonstrated (Gandía & Archidona, 2008).

The partial indexes were defined as demonstrated below:

$$I_i^P = \frac{\text{Score obtained in the subgroup}}{\text{Maximum total score obtainable}} \times 10$$

After obtaining the partial index, the calculation for verification of total index for each university was conducted. The calculation was performed as follows:

$$I^T = \sum_{i=1}^n I_i^P \times P_i^T$$



Where:

$I^T$  = Total index score;

$I_i^P$  = Score of the partial index based on the total index subgroups; and

$P_i^T$  = Proportion of overall total index score represented by the partial index “ $i$ ”.

It is important to note that the overall index is obtained not by simple arithmetic average of the different partial indexes, but the assessment of the relative weight of each item. Following the creation of the university disclosure index was to evaluate the hypotheses raised in order to verify which factors may determine a greater or lesser disclosure of information among federal Brazilian universities.

#### 4.3. Data analysis

This paper focuses on the access of information and accounting disclosure by federal universities in Brazil. The definition for accounting disclosure is subject to various interpretations “perhaps ranging from the information provided in audited notes and financial statements to any information set that might be employed by a user in arriving at some decision about economic entity at hand” (Gordon et al., 2002, p. 252). In this study, the disclosure of accounting information is examined in a more comprehensive way. Was verified information from a strictly financial aspect, such that financial statements, equity, budget, and explanatory notes were taken into consideration as well as aspects of information like expenditures, audits, and management procedures (Table 1).

By evaluating the aspects disclosed by universities on their websites, we were investigated the institutional factors that can influence the degree of transparency using a multivariate approach. The verification of the degree of transparency in each university was performed by measuring the proposed questionnaire.

Previous studies mainly analyzed the issues related to the informational and financial content, issues related to the navigability of this website, and the interaction with the citizens (Bertot et. al., 2010; Caba et al., 2005; 2008; Gandía & Archidona, 2008; Ho, 2002; Ho & Ni, 2004; La Porte et. al., 2002; Laswad et al., 2005; Moon, 2002; Norris & Moon, 2005; Pina et al., 2010; Tolbert & Mossberger, 2006; West, 2004; Wong & Welch, 2004). However, these studies have focused their samples in local and central governments of various countries and continents.

It is worth noting that the previous studies have focused their theoretical bases, on the principal-agent theory (Evans & Patton, 1987; Barber, 1983; Zimmerman, 1977). In fact, the relationship of agency in the public sector provides greater incentives for disclosure of information, which enables greater access to information. The internet can be used as an inexpensive tool for instantaneous and simultaneous dissemination of information to citizens, this means that it can be a way of communication, tracking and monitoring of political agents (Laswad et. al., 2005).

Previous studies show a relationship between the dissemination of information and certain characteristics of local governments, such as size (Barber & Sen, 1984; Ingran & de Jong, 1987), wealth (Lüder, 1992), age, quality, governance (Gordon et. al., 2002; Gallego et. al., 2009; Católico, 2012).

In this paper we evaluate the incentives for disclosure of information on the internet, and attempts to explain the determining factors for the level of disclosure of the federal Brazilian universities.

It was analyzed some characteristics such as size and age, with respect to governance; while the financial aspects were analyzed with respect to wealth. To complete our study, we have also focused on features related to efficiency and quality. Beyond the independent variables already contrasted by previous studies, we consider three variables that can be included in the group of variables related to efficiency. Furthermore, the size variable was divided into two

groups: one, measured by the number of undergraduates, and the other measured by the number of graduate students. All together we analyzed a total of nine independent variables. Table 2 describes how all the explanatory variables were calculated.

**Table 2.** Variable Description

	Definition	Source
University Wealth	Annual income	MEC website
Equivalent cost (COSTEQ)	$\frac{\text{Current costs}}{\text{Equivalent student}}$	University annual report
Size of the university (SIZEag)	Number of undergraduate students	University annual report
Size of the university (SIZEapg)	Number of graduate students	University annual report
Relationship student / employees (ALUMSERV)	$\frac{\text{Total ungraduate student}}{\text{Professors} + \text{adm. staff}}$	University annual report
University age (AGE)	Number of years since its foundation	University website
University quality (QUALITY inst)	Quality Index (RUF) published in 2013	Newspaper website of “Folha de São Paulo”
Professors quality (QUALITY prof)	Qualifying index of professors	University annual report
Governance	Number of members on the governing board	University website

## 5. Results and discussion

### 5.1. Descriptive results

Table 3 demonstrates the descriptive results obtained for the different indexes of disclosure presented, as well as those concerning to the independent variables.

**Table 3.** Descriptive statistics of the disclosures indexes and independent variables

Sample: 59 Universities					
Variable	N° Obs.	Dev.	Mean	Minimum	Maximum
<b>Dependent</b>					
UDI	59	1.11578	5.772542	3.19	8.51
IAI	59	1.310472	7.121017	3.7	9.26
ADI	59	1.702655	3.957627	0	7.5
<b>Independent</b>					
Wealth	59	.8758	19.8220	17.9337	21.59035
Costeq	52	5156.896	15477.09	8237.03	35317.84
Size (ag)	50	9922.191	14875.34	1008	40731
Size (apg)	50	2559.996	2199.29	0	11209
Alumserv	49	.5264	.1911	.1063	.3134
Age	59	30.8110	51.4745	3	105
Quality (inst)	54	20.4842	64.5681	12.46	95.64
Quality (prof)	52	.3789	4.1301	3.28	5
Governance	58	5.2582	6.7068	0	17

Analyzing the statistical data on the index of university disclosure index (UDI), we obtained an average value of 5.77 points. That means that universities disclose, on average, slightly more than 50 percent of the information available, taking into consideration only the aspects related to this study. The results can be analyzed in a positive way if we take as a measure isolated result for the average values of the index of access to information (7.12). In other words, for this indicator, more than 70 percent of the maximum possible value was disclosed. Diametrically opposite direction data on disclosure of accounting information had a

very poor outcome. The average for the ADI index was only 3.95 points. In this case, it can be noticed that the majority of the universities disclosed less than 40 percent of their accounting information. These results make it clear that universities are not taking full advantage of their websites to increase transparency, in addition, they are limiting themselves just to comply with legislation. This result is consistent with data presented by Pina, Torres, and Royo (2010) who detected in European cities the same limitation, and Gandía and Archidona (2008) who presented similar results for Spanish cities.

Figure 1. Content of access to information disclosure by Brazilian universities

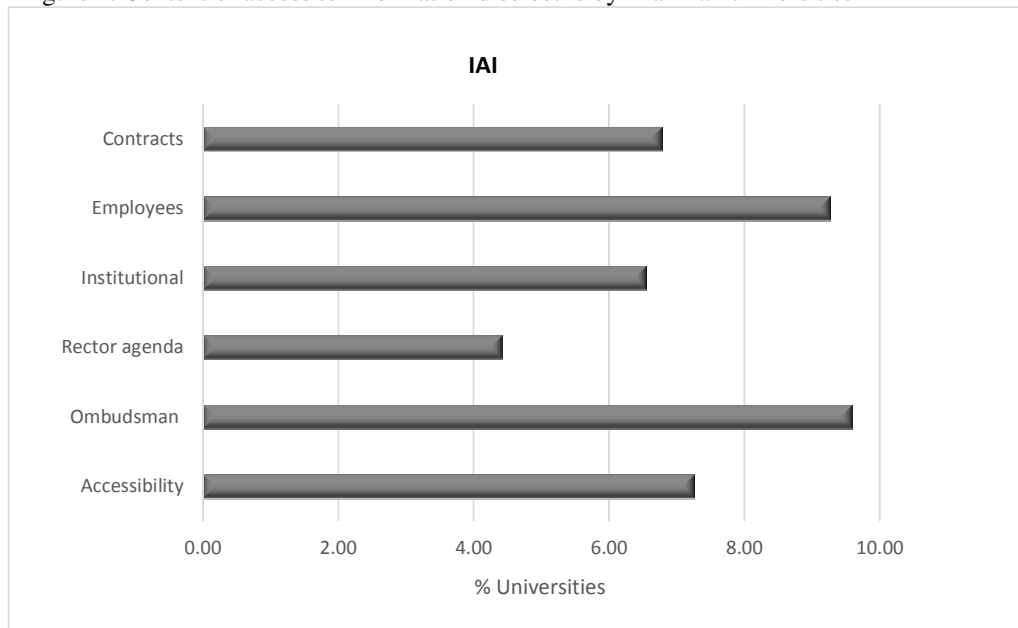
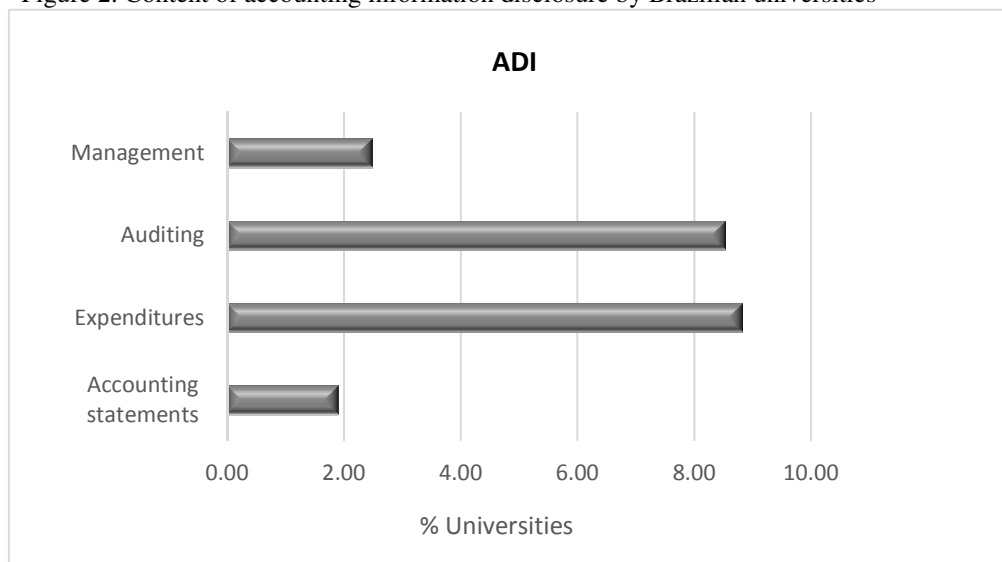


Figure 2. Content of accounting information disclosure by Brazilian universities



The Figures 1 and 2 shows the items evaluated in each of the universities for each of the proposed indexes and their respective results. The results realize that for the most IAI (Figure 1) disclosed were related to employees and the presence of an ombudsman office. Regarding the disclosure of accounting information (Figure 2), the factors related to the audit and expenditures of the institution were the most publicized. Importantly, the less information published was related to the accounting statements.

## 5.2. Multivariate regression analysis

The regression results are presented in Table 4, which presents the statistical of the three regression models obtained for the dependent variables (UDI, IAI and ADI), including estimated coefficients, statistics "t" and the coefficients of determination adjusted ( $R^2$  adjusted). Table 4 also shows the sign of the expected relationships between the dependent and independent variables. The "+" sign indicates a positive relationship, the sign "-" indicates a negative relationship.

**Table 4** Estimation results

Variable Independent	Estimation "UDI"	Estimation "IAI"	Estimation "ADI" (robust)	Expected Signs
Wealth	-0.8749116 (-1.59)	-0.9735284 (-1.51)	-0.2695604 (-0.51)	+
Costeq	-0.0000719** (-2.49)	-0.0001167** (-2.67)	-0.0000114 (-0.36)	-
Size (ag)	-0.0000525 (-1.33)	-0.0000305 (-0.53)	-0.0000821 (-1.65)	+
Size (apq)	0.0002706** (2.57)	0.0002126 (1.33)	0.0003487** (2.67)	+
Alumserv	-3.771764 (-1.27)	-5.873249 (-1.30)	-0.92873 (-0.22)	+
Age	-0.139632** (-2.68)	-0.0205356** (-2.59)	-0.0051067 (-0.80)	+
Quality (inst)	0.308287** (2.29)	0.0304813 (1.46)	0.0311631** (2.19)	+
Quality (prof)	0.3695621 (0.64)	0.8551523 (0.97)	-0.2815094 (-0.71)	+
Governance	0.0666736** (2.50)	0.1041501** (2.57)	0.0158777 (0.49)	+
Observations	45	45	45	
Within R <sup>2</sup>	0.4774	0.3838	0.3906	
Durbin-Watson test	1.577	1.607	1.251	
(F statistic)	3.55 (0.0032)	2.42 (0.0295)	1.94 (0.0788)	

\*\*\*Significant at 1%; \*\* Significant at 5%; \*Significant at 10%

An initial analysis of the results obtained by the three models reveals that there are two hypotheses that were not confirmed by any of the analyzed disclosure levels. The hypothesis related with wealth (H<sub>1</sub>) of the institution and the relation between employees and students (H<sub>6</sub>) was not statistically significant in any of the three regression models. The result obtained for the wealth (H<sub>1</sub>) variable was a surprise because in most studies this analysis is usually positive and significant (Gordon et. al., 2002; Laswad et. al., 2005, and Gandía & Archidona, 2008), as a determining factor for the disclosure of public information. However, other studies (Caba et. al., 2008, and Gallego et. al., 2009) have obtained results similar to ours; the wealth, to some extent, does not comprise a significant variable in this respect. Besides, the variable *Alumserv* (H<sub>6</sub>), hypothesis related with efficiency, was not confirmed as a relevant factor for information disclosure on the web.

Furthermore, the size and quality variables that had a close number of undergraduate students and the degree of specialization of the professors, respectively, showed no significant results for any of the regressions.

On the other hand, there are five hypotheses that have been confirmed at least in two of the three models presented: efficiency (was measured by cost per student), size (in this case, the variable proxy that is related to the number of postgraduate student), the age of the institution; quality (only, when the proxy measurement was the quality of the institution), and governance.

The hypothesis that argue that there is a negative relationship between cost per student (H<sub>5</sub>) and disclosure information is confirmed with a significant result, demonstrating that efficient universities disclosure more information, and that the lower the cost per student, the greater the administrative efficiency and therefore more information is disseminated on the internet. This result is consistent with a study conducted by Católico (2012), which argue that the

highest quality in public administration presupposes access to information requirements and greater transparency. This hypothesis was not supported for de ADI model.

Similar to the present paper, previous studies like Carbara and Garcia (2010), and Gandía and Archidona (2008) found a positive and significant relationship between the institution size (H<sub>2</sub>), and information dissemination on the internet. In this study we used two measurements to verify the size of the universities, one through the number of undergraduate students and another for the number of graduate students. This last one has demonstrated a positive and significant result; provide the fact that university with more graduate student tend to disclose more information on the web.

The results shown in Table 4 suggest that university age (H<sub>3</sub>) has a negative and significant relationship in relation to the disclosure of information on the internet. This variable had an unexpected negative sign, taking into account we expected that the oldest universities would disclose more information as demonstrated in studies conducted by Católico (2012) in Colombian universities. This result also suggests that we should analyze this variable with caution. Through the statistical information we showed that the federal Brazilian universities are relatively young with 75 percent of the sample having less than 67 years old. We created dummy variables for age groups and found out those 67 years old universities or older have a significant and negative influence on the dissemination of information. That is, effectively universities older than 67 years disclose less information over the web. In another age group younger than 67 years, the results of the regressions were all positive, however, only the group which age was between 3 and 11 years old, had a degree of significance of 10 percent.

The result of our study in relation to the university quality (H<sub>7</sub>), also came out as expected, in other words, universities that had better quality scores by “RUF” index released more information than those of lower quality. However, as shown in Table 4, when used as a quality proxy, the level of specialization of professors was not significant.

As shown in Table 4 the hypothesis that positively related governance (H<sub>4</sub>) with the disclosure of information was confirmed, except for the ADI model, however, the result shows a positive relationship as predicted. This result is in agreement with the one proposed by Gallego, García, and Rodríguez (2009), and Gordon, Fisher, Malone, and Tower (2002) although these studies did not obtain a significant result for their samples.

Finally, the results obtained by each regression model showed that the variables that most influenced the disclosure of accounting information are the size and quality of the university. In relation to access to information index the most significant variables were the cost per student, age, although this has a negative influence, and governance. And for the total index disclosure of information only those hypotheses related to wealth and the relationship employee/student did not achieve significant results.

## **6. Conclusions and discussion**

This study brings empirical evidence and knowledge to the academic literature on transparency and e-disclosure, especially with regard to the context of Brazilians’ public universities.

It must be emphasized that the level of e-disclosure in federal Brazilians universities are middling, however, considering the partial indexes, the general information dissemination level is medium-high, although the level of accounting information disclosed demonstrated to be quite small. The present study shows that the index to access information, which is regulated by the access information law, afforded a much higher result than the accounting disclosure index of voluntary disclosure. These results demonstrate that in the Brazilian context, the regulation of access of information has brought benefits to citizens, to the extent that the institutions analyzed in our study increased their transparency. Aspects related to quality, efficiency and governance showed to be determining factors for the dissemination of information with statistically significant results. Another interesting aspect verified in the Brazilian context was that universities younger than 67 years old showed better results in relation to the proposed indexes.

Perhaps this result was related to the fact that younger universities have to disclose more information to capture more students, especially those that have less than one decade of existence.

Several limitations to the study must be addressed. First, regards the composition of the sample. The study was conducted with federal Brazilian universities, however, there are other higher education institutions, with different forms of registered composition that were left out of this study, for example, private universities, state, municipal, community colleges, comprising a larger universe than analyzed in this work. Therefore, the present results cannot be generalized to higher education institutions of the universe in Brazil, but for the section composing this study. A second limitation in our study is the extent of information disclosure, once the quality of information has not been evaluated. A single sentence description of compliance received the same score as a detailed report of several pages. The subjective nature of classification based on the quality prevents this approach. In spite of these limitations, our work provides significant information about the determinants of e-disclosure.

Future studies aiming to check the aspects and necessities for improvement and expansion of disclosure of information on the web from the perspective of public administrators could help in the development of the new public management.

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