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## Management legitimacy of public universities supported by the quality of their internal audits

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Accepted manuscript

## TITLE PAGE

TITLE

Management Legitimacy of Public Universities Supported by the Quality of their Internal Audits

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ABSTRACT

The objective of this article was to analyze whether the internal audit explains the irregularities pointed out by the State control bodies, legitimizing the management of the public university organization. The study sample represents 40% of a population composed of 101 Brazilian public higher education organizations, called Federal Institutions of Higher Education (IFES), analyzed in the period from 2015 to 2017. Through a multiple linear regression, it was possible to infer that the more quality the internal audit of an IFES has, the fewer notes will be issued by the bodies that control it. The legitimacy of the management was measured through the number of irregularities reported by the State control bodies. To calculate the quality of internal auditing, an index was developed. From this result, it was concluded that public universities' management legitimacy is positively related to the internal audit quality of these organizations. This means that the quality of the audit contributes to legitimizing public management. This study is relevant to the managers of public universities since it points to the importance of qualifying the internal audit of their organizations so that the legitimacy of their management can be constituted. The results of this study contribute to reflections on policies reflected in the control systems of public organizations, enabling adjustments in the governance system of the Brazilian public sector.

**Keywords:** Legitimacy. Governance. Internal Audit. Control Bodies.

DECLARATIONS

**Funding:** We did not get any funding for this research.

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**Availability of data and material:** Data were obtained through the Transparency Portal of the Brazilian Federal Higher Education Institutions (IFES) and questionnaires sent to the IFES auditors and auditors of Control Bodies.

**Code availability:** To achieve objective and test hypothesis, we used the SPSS software.

**Ethics approval:** This research, which is the result of a master's thesis, was approved by the Ethics Committee of the University of Vale do Rio dos Sinos (UNISINOS) in July 2019.

**Consent to participate:** We, Cláudia Silveira Thys Mutti and Clea Beatriz Macagnan, as the authors of this article, submit to the Journal of SN Business & Economics this article, in English, entitled Management Legitimacy of Public Universities Supported by the Quality of their Internal Audits, for evaluation.

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## 1 INTRODUCTION

Universities play an important social role, as they enable professional training and research, contributing to the development of the society in which they are integrated (Ahumada-Tello, Ravina-Ripoll and López-Regalado 2018; Chen and Frank 2020; da Rosa Borges, Domingues and Cordeiro 2016; Larrán Jorge and Andrades Peña 2017; Senadjki, Ogbeibu, Yip, Yong and Senadjki 2021). In Brazil, the National Education Act (Brasil, 1996) increased the number of private universities, establishing competition in the higher education market (Favaro, Semzezem and Fernandes 2019; Gomes, Machado-Taylor and Saraiva 2018). In the last 15 years, enrollments in higher education have tripled (World Bank 2017). Of this amount, the vast majority (75.4%) refer to enrollments in private universities (da Silva Carvalho, dos Santos Santana, Soares, de Souza and Neto 2020; World Bank 2017). Along with the increase in enrollment, expenditure on higher education has also increased. According to World Bank (2017, p.119; 131; 134): 1) - Increasing public spending and falling public enrollment numbers result in higher expenditure per student; 2) - a student at a public university in Brazil costs two to three times more than students at private universities, and 3) - Brazilian private universities tend to be more efficient than public ones. In this sense, managers of public universities are increasingly required in terms of the efficiency of the resources invested in the universities. Therefore, to guarantee the maintenance of public educational organizations, the legitimacy of their management should be constituted.

The legitimacy of public universities can be attested through their control bodies, which attest to the administrative efficiency and the effectiveness of management acts (Rocha 2002). Among these bodies, the Federal Court of Accounts (TCU) and the Comptroller General of the Union (CGU) (Brasil 1988) stand out at the Brazilian federal level. They aim at inspection and control through audits on state investments of public executing organizations (Talbot and Wiggan 2010). As a result of these audits, control organizations issue recommendations and determinations to managing organizations, identified in notes, with the interest that adjustments are made to increase their performance and to produce information for all interested parties involved in the process (Otetea, Tita, and Ungureanu 2015).

The degree of performance of the control bodies, measured through their notes, makes it possible to infer the management legitimacy of public organizations regarding the investments established by the State about their efficiency. The letters of the control bodies can be influenced by the adjustment of management to their system of rules through the intervention of their internal audits, which aim, among others, to assist their managers (Janse and Coetzee 2016), adapting their management to current regulations. Thus, based on the quality of the internal audit work, this objective can be met (Dittenhofer 2001; Janse and Coetzee 2016), and the management legitimacy attested.

Revised studies indicate that the internal audit quality reduces administrative corruption in the public sector (Asiedu and Deffor 2017) and contributes to more effective internal control (Jiang, André and Richard 2018; Mazza and Azzali 2015). These results, explained by the internal audit quality, can be seen in reducing the notes of the control bodies. In this perspective, the hypothesis formulated is that the greater the number of irregularities pointed out by the State control bodies, the lower the legitimacy of the management of the public university organization, measured by the quality of its internal audit. In this context, this study aimed to analyze whether the internal audit explains the irregularities pointed out by the State control bodies, legitimizing the management of the public university organization.

In Brazil, according to INEP (2017), public expenditure on education as a percentage of gross domestic product (GDP) is 5.6%, higher, therefore, than the average of OECD countries (4.4%). The Brazilian rate is only below countries like Sweden (5.8%), Belgium (5.7%), Iceland (5.7%), Finland (5.8%), and Norway (7.2%) (INEP 2017). In public higher education, the volume of resources spent by the Brazilian government per student represented 85% of the country's GDP per capita in 2013, while the average for OECD member countries was 41% (Nascimento and Verhine 2017).

In this context in which a large allocation of public resources to public higher education is perceived, public higher education organizations at the federal level stand out. According to World Bank (2017), these educational organizations have their average expenditure per student as one of the highest, indicating their relevance to other Brazilian educational organizations. In this perspective, the population of this study consisted of 101 public higher education organizations at the federal level, called Federal Institutions of Higher Education (IFES), and the data collected from these organizations yielded 303 observations between the years 2015 and 2017.

As a result of the first tests of the study, the negative relationship between IFES's internal audit quality and the number of notes of their control bodies stand out, confirming the research hypothesis. This

means that the higher the internal audit quality, the fewer notes will be issued by the Brazilian State's control bodies, making it possible to infer the legitimacy of IFES's management. It also points to the contribution of the internal audit to the search for efficiency in the direction of public resources in higher education organizations. Thus, the results obtained can contribute to reflections on policies reflected in the control systems of public organizations, enabling adjustments in the governance system of the Brazilian public sector.

Given the aim and hypothesis of this study, in a perspective of deepening and specifying the elaboration carried out, next, chapter 2 focuses on the formulation of the view from the literature review and, subsequently, chapters 3 to 5 deal with the methods, the results and the discussion and, finally, the final considerations.

## **2 FROM THE LITERATURE REVIEW TO THE FORMULATION OF THE HYPOTHESIS**

According to the literature review, studies with a sample of countries characterized as capitalists show that management was focused on the perspective of public choice, which assumed that efficiency was achieved by perfection in the hierarchical ordering of a professionally trained public service (Ostrom and Ostrom 1971). Subsequently, the public administration's point of view turned to the New Public Management (NGP). NGP's focus was almost exclusively on developing management techniques to guarantee customer satisfaction and service efficiency. It was a management system inspired by private sector organizations (Peters and Pierre 1998).

More recently, public management studies have emerged to measure results in terms of products and services (Bovaird and Loeffler 2009); these studies would support the governance system in the public sector. Thus, governance in the public sector arises not only to improve the performance of its organizations, as highlighted in the study by Bovaird and Loeffler (2009) but also to reduce conflicts, align actions and bring more security to everyone involved (TCU 2014). This governance can be considered, then, as the government's efforts directly influence the public services provided (Quintana, Jacques, and Macagnan 2013).

### **2.1 Public Sector Governance: Control Bodies and Internal Audit**

Governance in the public sector focuses on how different organizations interact to achieve higher results. As a result of good governance, decision-making can be highlighted, considering the opinion of all involved and corruption reduction (Bovaird and Loeffler 2009). In 2001, the International Federation of Accountants (IFAC) guided public bodies based governance on the principles of transparency, integrity, and accountability. With this, the result expected by IFAC was to enable public administration to operate in a more effective, efficient, and transparent manner (IFAC 2001).

In Brazil, in the 1980s, to make governments more efficient, initiatives for governance in the public sector, such as acts and decrees, were established to institutionalize the governance system directly or indirectly (TCU 2014), namely: the Fiscal Responsibility Act (LRF) and the Access to Information Act (LAI) (Quintana, Jacques and Macagnan 2013). LRF establishes public finance rules aimed at accountability in tax management. The act, in its first article, when conceptualizing fiscal responsibility as a "planned and transparent action, which prevents risks and corrects deviations capable of affecting the balance of public accounts," introduced one of the guiding principles of governance in the public sector, establishing bases for budgetary control and transparency (Brasil 2000; IFAC 2001). With the advent of LAI in 2011, clarity, introduced by LRF, is then highlighted.

LAI joins other governance initiatives in the public sector, establishing, in its second article, that all federal public administration bodies and entities must have, on their respective web pages, a space called "Public Transparency" (Brasil 2011). In this sense, public transparency ensures the fundamental right of access to information and facilitates the monitoring and control of administrative acts and the conduct of public agents (TCU 2014). From these initiatives, others began, such as, more recently, the publication of Decree No. 9,203, of November 22, 2017, which provides for the government policy of the direct, autarchic, and foundational federal public administration.

From this decree, governance in the Brazilian public sector was established as a system of leadership, strategy, and control that assesses directs, and monitors management (Brasil 2017). The governance comprises both administrative instances and work processes, instruments, information flow, and the behavior of people directly or indirectly involved (TCU 2014). Among the administrative cases portrayed in the decree, we can highlight those that work: 1) directly in governance: TCU and management of public organizations and 2) indirectly in governance (as a supporting entity): CGU and internal audit of public organizations (TCU 2014).

## Control Bodies

The interactions between the State and society result in functions exercised through organizations (instituted by the State) that aim to guarantee administrative order and efficiency and the effectiveness of their acts (Rocha 2002). Among the organizations created by the State, there are those of control, which have the function of supervising, through audits, the state investments used by the executing organizations (Talbot and Wiggan 2010). As a result of these audits, control organizations issue recommendations and determinations to executing organizations, with the interest that adjustments are made to increase the public organization's performance and produce information for all interested parties involved in the process (Otetea, Tita and Ungureanu 2015).

In Brazil, the control bodies are provided for in the 1988 Constitution. One of them is called external control and is exercised by the legislative branch with the assistance of the Court of Accounts. The Brazilian Federal Constitution of 1988 provides, in addition to external control, internal control: exercised by the branch or body themselves and established by the organization's management system. Both controls, constitutionally provided for and designated as State Control Bodies, perform the role of auditing, certifying the regularity or pointing out the irregularities of the activities of the other State bodies (Brasil 1988).

The Court of Accounts is an autonomous and independent body, not linked to any organization (TCU 2014); at the federal level, it is called the Federal Court of Accounts, and the State Court of Accounts at the state and municipal level. It is incumbent upon the Courts of Accounts, among others: 1) to supervise the application of funds transferred by the Brazilian State; 2) to provide accounting, financial and budgetary information; and 3) to apply the sanctions provided by law to those responsible, in case of the illegality of expenditure or irregularity of accounts (Brasil 1988). In addition to its competence, the Court of Accounts plays a vital role in public sector governance (TCU 2014).

According to article 74 of the Brazilian Federal Constitution, the Legislative, Executive, and Judiciary branches will maintain an internal control system to aid the Court of Accounts. Upon learning of any irregularity or illegality, those responsible for this internal control will inform the Court of Accounts under penalty of joint and several liabilities (Brasil 1988). The CGU is part of the internal control system of the Federal Executive Branch; it is charged with the normative guidance and technical supervision of the other federal agencies (Brasil 2000). Among the CGU's competencies, prevention and the fight against corruption stand out within the scope of the national public administration (Brasil 2016). The support for this internal control system is configured by the internal audit (CGU 2017), which also acts in the public sector governance system as an inner support body (TCU 2014), named by Decree No. 9,203, of November 22, 2017, as Single Internal Audit.

## Internal Audit

The Institute of Internal Auditors (IIA) defines an internal audit as an objective and independent consulting activity designed to add value and improve the operation of an organization (IIA 1999). The internal auditor's permanent task is to deal with the comprehensive internal control system as a risk management tool. This includes implementing appropriate internal controls and the constant concern that their role can significantly contribute to realizing defined risk strategies (Moeller 2016). Based on this scenario and due to the changes in the internal audit, which is constantly evolving, the idea arises that this audit should be frequently evaluated to guarantee the efficiency and effectiveness of its operation (Dittenhofer 2001).

Based on this, the IIA suggests that a good quality internal audit must comply with IIA standards and the code of ethics and meet the expectations of interested parties (IIA 2010). In the public sector, internal audits can contribute to helping the sector meet its challenges. However, as observed in the literature, this contribution can only be made if the internal auditors are adequately qualified, competent and capable (Janse and Coetzee 2016).

In the context of IFES, an internal audit exists to assess the effectiveness of internal controls implemented by managers. It is an independent and objective assessment and consultancy activity designed to add value and improve an organization's operations. It assists an organization in achieving its objectives by applying a systematic and disciplined approach to assess and improve the effectiveness of risk management, control, and governance processes (IIA 2012). IFES's internal audits are responsible for providing assessments and advice to its management. More efficient and effective controls mitigate the main risk that these educational organizations will not achieve their objectives (CGU 2016).

## 2.2 Rationale of the hypothesis

One of the Legitimacy Theory assumptions holds that to continue making progress, an organization must act within the limits and norms of the social system in which it is inserted (Brown and

Deegan 1998; O'donovan 2002). This social system is composed of groups, referred to in the literature as stakeholders, who provide support to organizations, thus allowing their continuity (Freeman 2010). In the context of IFES, we can highlight the following stakeholders: a) customers (students and other consumers of teaching, research, and extension services); b) employees (public servants who provide service to IFES); c) the community in which IFES are inserted; and d) the governments that grant the resources for the maintenance and survival of IFES (Seibert 2017). Other stakeholders, for the context of this study, would be the control bodies, whose function is to support these organizations, inspecting, through audits, the state investments used by them (Talbot and Wiggan 2010), with the interest that adjustments are made to increase their performance (Otetea, Tita and Ungureanu 2015), contributing to their continuity. In summary, IFES exist when these stakeholders consider them legitimate, that is, when they give them a status of legitimacy.

The status of legitimacy is established by the social perception or generalized assumption that an organization's actions are desirable or appropriate to the social system in which it is inserted, based on norms, values, beliefs, and definitions (Suchman 1995). The identification of this state, in the context of this study, occurs through the degree of performance of the control bodies of the Brazilian State, measured through its recommendations and determinations, identified as notes, and directed to IFES's management so that adjustments are made to ensure the correct use of public funds.

Some factors influence these notes, including the cost per student (Santos, Barbosa, Martins, and de Moura 2017), which would provide legitimacy to the management of these organizations to the extent that it would meet greater social demand for training at a lower cost. Another aspect that could influence the notes of the control bodies and provide legitimacy to the management of these organizations would be management adjusted to their system of rules, reducing the number of letters. In this sense, the internal audit can contribute since it has as one of its objectives to help its managers (Janse and Coetzee 2016) in order, among others, to adapt the management to the current regulations. Therefore, based on the quality of the internal audit work, this objective can be met (Dittenhofer 2001; Janse and Coetzee 2016), thus reducing the number of notes issued by the control bodies and providing legitimacy to their management before these bodies.

Studies carried out in the university context aimed at evaluating the internal audits of higher education organizations to perceive their good functioning and, consequently, to provide indications that the better their work, the fewer problems can be raised. In this sense, the studies by Arana (2013), Christopher (2012), de Brito, Pimenta, de Souza and da Cruz (2017), Machado, Serra and Gomes (2018) and Ribeiro (2016), stand out. The study by Christopher (2012) aimed to examine how internal audit, as a control mechanism, is adopted in Australian public universities. As a result, the study found inconsistencies in this control mechanism, which regulatory problems can sustain. Arana (2013) evaluated the internal audits of Spanish universities and found limited internal auditing. In addition, the study identified that the internal audit quality could be influenced by the number of people allocated to carry out their work. About the studies by Ribeiro (2016) and Machado, Serra, and Gomes (2018), the aim was to identify the presence of internal audit and understand its importance in Portuguese public universities. As a result, it was determined that not all universities have an interior audit sector. In Brazil, the study by de Brito, Pimenta, de Souza, and da Cruz (2017) that aimed to assess IFES's internal audit about the presence of a risk-based audit (RBA) concluded that it is consolidated in most IFES and that RBA has the benefit of improving communication and monitoring of internal audits.

Based on the results of studies in the university context about what can be said about the internal audit quality, five other studies were carried out outside this context to identify indicators for this quality. Listed below are the studies and indicators identified:

- 1- Savcuk (2007): subordination, qualification, strategy and estimated efficiency;
- 2- Mihret and Yismaw (2007): experience, communication and management support;
- 3- Alzeban and Gwilliam (2014), Badara and Saidin (2013), and Coetzee and Erasmus (2017): management support, independence (subordination), qualification, experience, cooperation between internal and external auditors and the size of the department; and
- 4- Regoliosi and d'Eri (2014): management support, independence (subordination), qualification, experience, cooperation between internal and external auditors, and the size of the department.

In addition to these studies referring to the internal audit quality indicators, other studies that concluded on some cause and effect relationships, taking into account the internal audit quality as a cause, were identified. In this sense, about the effects caused by the increase in the internal audit quality, we have a) the reduction in the delay in the work of the internal audit, driven, expressly, by the indicators of the auditor's competence and the quality of their fieldwork (Pizzini, Lin and Ziegenfuss 2015); b) the reduction of good corporate governance, because lower governance requires a higher internal audit quality since the



company must create more efficient internal control systems (Regoliosi and d'Eri 2014); c) the reduction in fees paid to external auditors. According to the authors, this reflects the confidence of the external auditors in the work of the internal auditors (by Mat Zain, Zaman, and Mohamed 2015); d) the reduction of administrative corruption in the public sector. The authors concluded that the quality of the internal audit capable of this reduction is due to its level of independence and the implementation of specific legislation (Asiedu and Deffor 2017); e) the increase in good management conduct (Ege, 2015); f) the increase in more effective internal control (Jiang, André and Richard 2018; Mazza and Azzali 2015;); and g) the increase in organizational performance and the financial report of the external audit (Fareedmastan, Gameda, Rajeswari and Muhammed 2015; Gros, Koch and Wallek 2017; Jiang, André and Richard 2018).

Considering theoretical studies on legitimacy, it is understood that public resources invested in public universities must be managed according to the interests of society. In this sense, managers who present irregularities in their management, pointed out by the State control bodies, would not be legitimized by society. Furthermore, according to the empirical studies reviewed, anomalies can be mitigated by the quality of the managers' audit system. Thus, a lower number of irregularities means better audit quality, which would legitimize the public management of these organizations.

Given the theoretical and empirical studies reviewed and to achieve the aim of this study, the following theoretical model was elaborated, presented in Figure 1 below.

**Fig. 1 Theoretical Model**

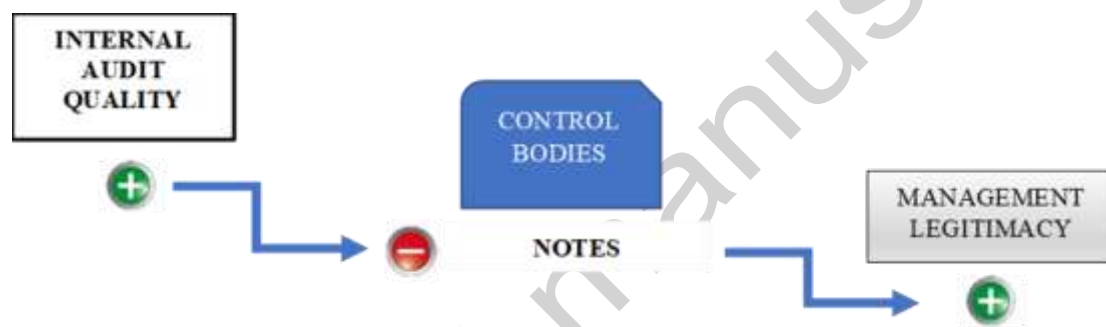


Figure 1 indicates that: better internal audit quality implies fewer notes from the control bodies, and more occasional notes from the control bodies suggest more legitimacy of the management. From this, we have the following hypothesis:

H1: The greater the number of irregularities pointed out by the State control bodies, the lower the legitimacy of the management of the public university organization, measured by the quality of its internal audit.

### 3 METHODS

Next, the econometric model, its respective variables, and the source and collection of research data will be presented.

*An econometric model of multiple linear regression*

$$ettES_{it} = \beta_0 + \beta_1 IAQ_{it} + \beta_2 LOG\_COST\_STUD_{it} + \beta_3 INTEG\_C_{it} + \beta_4 DIR\_HIRES_{it} + \beta_5 BIDD_{it} + \beta_6 HDI_{et} + \varepsilon_{it}$$

*Dependent variable: Notes (NOTES)*

Nature of the variable	Variable	Description
Dependent	Notes (NOTES)	Sum of recommendations and determinations made by the State's control bodies, divided by the size of the IFES (total of: civil servants, students, outsourced workers and interns).

*Variable of Interest: Internal Audit Quality Index (IAQI)*

The quality indicators (9 indicators) presented in Chart 1 below, referring to the variable of interest (IAQI), were selected from the review of previous studies and adapted to the context of IFES. The presence of each indicator in each IFES is confirmed and multiplied by a specific weight, also according to the empirical review of the literature. This results in an index where its value is 19 when the maximum score is obtained. The calculation of the index for each IFES is the result of the following formula:

$$I_j = \frac{\sum_{i=1}^{nj} \chi^{ij}}{nj}$$

Where  $n_j$  is the total value of 19, which indicates the maximum expected value for each institution,  $j$  is the institution.  $I$  is the index obtained by the institution. The  $X_{ij}$  of each indicator is characterized as dichotomous, assuming its respective value when its existence has been confirmed and 0 when its existence has not been confirmed (Rodríguez and Macagnan 2015; Seibert 2017), multiplied by the value, which represents the weight of the indicator (Chart 1).

Chart 1 - Internal Audit Quality Indicators

Indicator	Value (weight)	Description	Observation
Education	2	Education of the chief auditor.	The indicator is confirmed when the auditor is a master or doctor.
Experience	2	Years of experience of the chief auditor (in internal audit).	The indicator is confirmed when the experience is equal to or greater than five years.
Training	2	Training, specific to the area, received by the internal auditor.	The indicator is confirmed when the auditor has been trained over a year.
Independence (subordination)	2	Position of the internal audit in the IFES's organizational structure.	The indicator is confirmed when the internal audit is subordinated to the superior council or equivalent body.
Strategy	3	Presence of a risk-based audit (RBA).	The indicator is confirmed when the internal audit carries out its activities through risks pointed out by IFES's management.
Estimated efficiency	3	Comparison between planned and executed actions.	The indicator is confirmed when the planned actions are equal to or less than the executed actions.
Communication of results	1	Communication of audit reports to internal and external members of IFES.	The indicator is confirmed when the communication is made.
Management support	3	Management support for internal audit.	The indicator is confirmed when support is provided.
Cooperation with State control bodies	1	Support given by the internal audit to the external audit to IFES.	The indicator is confirmed when support is provided.
Note: the values (weights) have been identified through previous studies, namely: Alzeban and Gwilliam (2014), Badara and Saidin (2013), Mihret and Yismaw (2007) and Regoliosi and d'Eri (2014).			

*Control Variables*

Chart 2 - Research control variables, authors, and expected sign

Variable	Description	Authors	Expected Sign
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<i>Logarithm of Cost per Student (LOG_COST_STUD)</i>	Logarithm of the total number of students divided by the current cost of each IFES (current cost: total current expenses, retirement pensions, pensions, judicial convictions and personnel expenses).	Santos, Barbosa, Martins and de Moura (2017)	+ (positive)
<i>Integrity Commission (INTEG_C)</i>	Presence of an integrity commission at the IFES (dummy variable).	-	- (negative)
<i>Direct Hires (DIR_HIRES)</i>	Percentage of expenditure with layoffs and unenforceability of IFES, in relation to the total (total: Bidding + Direct Hires + Supply of Funds + Payment of Personnel).	Bairral, Silva and Alves (2015). Trilha, Alves and Nunes (2018).	+ (positive)
<i>Bidding (BIDD)</i>	Percentage of expenditure with IFES's bidding processes, in relation to the total (total: Bidding + Direct Hires + Supply of Funds + Payment of Personnel).	Bairral, Silva and Alves (2015).	+ (positive)
<i>Human Development Index (HDI)</i>	Human development index by Brazilian state.	Oliveira and Pisa (2015).	- (negative)
$\varepsilon$	Random error		
<i>It</i>	IFES year		
<i>et</i>	State year		

Source and data collection

Chart 3 - Source and Collection of variable control data

Variable	Source	Collection
<i>Internal Audit Quality Index (IAQI)</i>	Questionnaire via Google Forms. (Sent to 101 chief auditors of IFES and 57 auditors of the State control bodies, responsible for the supervision of IFES).	Return of 40 chief auditors of IFES and 27 auditors of the State control bodies.
<i>Notes (NOTES)</i>	Transparency Portal of State control bodies.	40 IFES.
<i>Logarithm of Cost per Student (LOG_COST_STUD)</i>	IFES's Management Report (from 2015 to 2017). *2018 was not included in the sample because it had new legislation in relation to the Management Report format.	From 2015 to 2017.
<i>Integrity Commission (INTEG_C)</i>	Questionnaire via Google Forms (Sent to 101 chief auditors of IFES).	Return of 40 chief auditors of IFES.
<i>Direct Hires (DIR_HIRES)</i>	IFES's Management Report (from 2015 to 2017). *2018 was not included in the sample because it had new legislation in relation to the Management Report format.	From 2015 to 2017.
<i>Bidding (BIDD)</i>	IFES's Management Report (from 2015 to 2017). *2018 was not included in the sample because it had new legislation in relation to the Management Report format.	From 2015 to 2017.
<i>Human Development Index (HDI)</i>	Electronic page - Atlas Brasil	40 IFES.

As seen in the last column of Chart 3, 40 IFES had their data collected, as 61 IFES were excluded from the population. Of these 61 IFES, 42 were excluded because the chief auditors did not return the questionnaire (sent three times), and 19 IFES were banned for not having any inspection by the State control bodies from 2015 to 2017. Therefore, out of 303 initial observations (101 IFES x 3 years), the sample of 40 IFES yielded 67 comments.

#### 4 RESULTS AND DISCUSSION

Next, we present the descriptive analysis of the sample, the analysis of the correlation between the independent variables, and the analysis of multiple linear regression.

#### *Descriptive analysis of the sample*

Table 1 - Descriptive statistics

	N	Minimum	Maximum	Mean	Standard deviation
NOTES	67	0.0001	0.0098	0.0014	0.0021
IAQI	67	0.2632	0.8421	0.5122	0.1572
LOG_COST_STUD	67	3.8611	4.4848	4.2030	0.1479
DIR_HIRES	67	1.0000	7.5000	3.3465	1.7143
BIDD	67	4.9600	19.0600	11.3110	4.0809
HDI	67	0.6830	0.8370	0.7573	0.0426

Regarding the internal audit quality index (IAQI), it can be seen, in Table 1, that the mean was 0.51 points and that its maximum was 0.84 points. No observation reached the maximum score for the quality index, which would be 1 point. This means that IFES's internal audits still have room for improvement, considering the quality metrics used in this study. This can be done, according to studies by Alzeban and Gwilliam (2014), Badara and Saidin (2013), Coetzee and Erasmus (2017), Mihret and Yismaw (2007), and Savcuk (2007), qualifying auditors, through incentives for master's and doctorate degrees or more training. Another way to prepare them would be to support and allow greater independence in their work. Other factors that are proven to improve internal audit quality, according to these studies, are the establishment of an RBA, the strengthening of the relationship between internal and external auditors, and effective planning and communication of the results of the work of the internal audit.

#### *Correlation analysis between variables*

After performing the descriptive analysis of the variables, the existing correlation between the independent variables was analyzed through the Pearson correlation coefficient, which measures the strength of their associations (Hair, Black, Babin, Anderson, and Tatham 2009).

Table 2 below shows the result of the Pearson correlation coefficient.

Table 2 - Pearson correlation coefficient

Variables	IAQI	LOG_COST_STUD	INTEG_C	DIR_HIRES	BIDD	HDI
IAQI	1	0.148	0.164	0.101	0.123	0.369
LOG_COST_STUD		1	-0.096	0.250	-0.360	0.134
INTEG_C			1	0.095	-0.154	-0.061
DIR_HIRES				1	0.105	-0.062
BIDD					1	0.030
HDI						1

The results above demonstrate that no independent variable is strongly correlated with another. Therefore, the assumption of multicollinearity was met to run the regression test, with the results shown below.

#### *Analysis of multiple linear regression*

Two regression tests were performed since, from the first test results, it was observed that the variables INTEG\_C and HDI were not significant to explain the independent variable NOTES. The second test result, without the presence of the variables INTEG\_C and HDI, is shown in Table 3 below.

Table 3 - Multiple Linear Regression Test

Variables	B	Standard error	Beta (Coefficients)	t-statistic	Sig.
(Constant)	-0.035	0.006		-5.602	0.000***
IAQI	-0.002	0.001	-0.164	-1.727	0.089*
LOG_COST_STUD	0.008	0.001	0.588	5.544	0.000***
DIR_HIRES	0.000	0.000	0.258	2.638	0.011**

BIDD	0.000	0.000	0.391	3.796	0.000***
<b>R</b>	<b>R<sup>2</sup></b>	<b>Adjusted R<sup>2</sup></b>	<b>Standard Error</b>	<b>F</b>	<b>Sig</b>
0.686	0.471	0.437	0.0015447	13.789	.000

Variables: (Constant), IAQI, LOG\_COST\_STUD, DIR\_HIRES, BIDD

The results in Table 3 show an  $R^2$  of 0.471, indicating that the independent variables used in the model (IAQI, LOG\_COST\_STUD, DIR\_HIRES, BIDD) can explain 47% of the behavior of the dependent variable (NOTES). This means that the variables of the econometric model can explain part of the reasons for the notes, identifying aspects that the IFES's managers should observe to legitimize their management before their control bodies. However, on the other hand, it shows limitations to be studied in further studies in the sense of trying to find new factors that could explain the notes established by the control system regarding the use of its resources.

As shown in Table 3, the variable of interest IAQI had a negative relationship with the dependent variable NOTES, demonstrating that the higher the quality index of IFES's internal audit, the lower the number of notes made by their control bodies. This result indicates a difference between the findings of the studies by Pizzini, Lin, and Ziegenfuss (2012) and Ege (2013). This is because the increase in internal audit quality (Table 3) is not only related to the reduction in the delay of internal audit work (Pizzini, Lin & Ziegenfuss, 2012) and the increase in good management conduct (Ege, 2013). This increase in the quality of the internal audit (IAQI), identified in this study, is related to something different, that is, the reduction of notes from the control bodies (NOTES) that may indicate the reduction of problems related to internal controls and, consequently, the reduction of administrative corruption in the public sector. In that regard, this result corroborates the findings of previous studies that indicate a negative relationship between internal audit quality and administrative corruption in the public sector (Asiedu and Deffor 2017) and between internal audit quality and the problems related to internal controls (Jiang, André, and Richard, 2018; Mazza and Azzali 2015). However, both the findings of Asiedu and Deffor (2017), as well as those of Mazza and Azzali (2015) and those of Jiang, André, and Richard (2018), did not point to the contribution made by the quality of internal audit about the legitimacy of management. It is in this sense that this result differs from the others. In other words, the finding of this study, in addition to strengthening the previous ones, raises the issue of the contribution given by the quality of the internal audit about the legitimacy of the management of the IFES with their control bodies. The more quality the internal audit has, the control bodies will report the fewer notes. Consequently, the more reliable the management of these educational organizations will be before their control bodies. Thus, we consider that the multiple linear regression model used is adequate and validates the research hypothesis that the greater the number of irregularities pointed out by the State control bodies, the lower the legitimacy of the management of the public university organization, as measured by the quality of its internal audit.

About the other independent variables, the variable LOG\_COST\_STUD stands out as it has a positive relationship with the dependent variable NOTES; when the cost per student of IFES increases, the number of notes made by their control bodies also increases. This can be explained because the cost per student is related to the current price of these educational organizations (total current expenses, retirement pensions, pensions, judicial convictions, and personnel expenses). In other words, the higher the current cost, the greater the difficulties for managers to manage their expenses, which can lead to a more significant number of notes by their control bodies, affecting the management legitimacy of these organizations provided by these bodies. This study confirms what was found by Santos, Barbosa, Martins, and de Moura (2017), who highlighted a negative relationship between the cost per student and the efficiency in public expenditure of IFES. This result corroborates that of the study by Santos, Barbosa, Martins, and de Moura (2017) when identifying that the increase in the current cost increases the number of notes of the control bodies related to problems that interfere with the efficiency of the management of public expenditure. However, in addition to the study by Santos, Barbosa, Martins, and de Moura (2017), the result of this study has a particularity in proving that the higher the cost, the greater the challenges for the legitimacy of the management of these organizations to be established.

The variable BIDD also showed a positive relationship with the dependent variable NOTES. The higher the costs of bidding expenses, the more notes will be made by the control bodies. This is explained by the high volume of resources available for bidding, which causes it challenging to manage and, consequently, questions the legitimacy of the organization's management. The legitimacy challenge identified here can be overcome if we consider the result of Bairral, Silva, and Alves (2015), which proves an increase in the organization's transparency index due to the disclosure of bidding expenses, thus legitimizing the organization's management. Knowing that transparency facilitates the monitoring and

control of administrative acts (TCU, 2014) and that it takes place through the dissemination of information (Bairral, Silva, and Alves, 2015), our result is complemented by that of Bairral, Silva, and Alves (2015), but with a distinction. That is to conclude that the challenge of legitimizing the management of public higher education organizations can be minimized when there is a disclosure of these expenses, despite the difficulty in managing them.

The variable DIR\_HIRES showed a positive relationship with the dependent variable NOTES. The greater the expenses with direct hires, the more notes will be made by the control bodies. This is explained by the number of direct hires that, according to a study by da Silveira Trilha, Alves, and da Silva Nunes (2018), is greater than the sum of the quantity of all other types of purchases, making it difficult to manage these expenses and, consequently, challenging the legitimacy of the organization's management. Unlike what was found forbidding, the study by Bairral, Silva, and Alves (2015) did not identify an increase in the organization's transparency index when disclosing the expenses with direct hires; this disclosure is still low. Therefore, this study contributes to those found in the studies by Silveira Trilha, Alves, and da Silva Nunes (2018) by adding the importance of disclosing expenses with direct hiring by these companies, according to Silveira Trilha, Alves, and da Silva. Silva Nunes (2018), a considerable volume compared to other types of purchases.

Differently from what was found in these last two studies reviewed, the result of this one adds that, despite the difficulty encountered by the management about the management of its expenses, whether they are bidding or direct contracting, their disclosure would reduce the challenge of legitimizing these public higher education organizations.

Finally, about the variables BIDD and DIR\_HIRES, it is concluded based on the data exposed in Table 3 that the relationship between BIDD and NOTES is greater than the relationship between DIR\_HIRES and NOTES, and this is explained because the amounts released for bidding processes are higher than the amounts released for direct hires. However, the number of direct hires is higher than the number of bidding processes, according to the study by Silveira Trilha, Alves, and da Silva Nunes (2018). It can then be concluded that the more value involved in a purchase, the more difficulties managers will have to manage, regardless of their quantities. However, disclosing these data would reduce the challenge of legitimizing these public higher education organizations, according to the announced results discussed here.

## 5 FINAL CONSIDERATIONS

This study analyzed the management legitimacy of public universities attested by their control bodies, based on these educational organizations' internal audit quality. For this, a sample of 40% of the population of 101 IFES was selected, making 67 observations, collected, and analyzed in the period from 2015 to 2017. The data were collected from questionnaires sent to the internal auditors of IFES and the auditors of the State control bodies.

The main conclusion is that the quality of the internal audit of public universities provides legitimacy to their management before their control bodies. This quality can be improved in several ways, the most comprehensive of which is related to management support in internal audit work, whether by enabling the internal audit to carry out its work independently, offering more training through training programs, or incentives to take graduate courses. As a conclusion of this study, we confirm the following explanatory factors of the notes of the control bodies: cost per student, percentage of bidding processes, and rate of direct purchases. In addition to the internal audit quality, the managers should also observe these factors so that their management can be legitimized.

The study had some limitations that could become challenges for future researchers. First, it would be essential to expand the sample size to obtain a more significant number of observations and conduct comparative studies in other institutions, and the IFES studied herein. Second, regarding the methods, it is suggested that the weights of each of the nine quality indicators of internal audit be reestablished through a survey of specialists in internal auditing and control bodies.

Finally, in addition to the previous suggestions, it is estimated that further studies can be carried out to identify which are the most frequent notes and what improvements could be made about internal audits and their qualities to mitigate certain occurrences that frequently arise and that may affect the management legitimacy of public universities. In addition, we suggest that further studies be carried out to understand the quality of the control bodies about their objectives, such as the inspection of public organizations.

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