

Determinants of Internal Audit effectiveness

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ABSTRACT

The aim of this study was to understand, among the organizational factors that influence the effectiveness of Internal Audits (IA), which are perceived as most relevant by heads of IA units working in Federal Universities and Institutions that are part of the Federal Education Network, based on Lenz's model (2013). To this end, factor analysis and cluster analysis techniques were applied. The results obtained led to the regrouping of the model's variables based on their factor loadings and communalities, and made it possible to identify the degree of relevance of the indicators that represent the influence of organizational factors on the effectiveness of IA.

Key words: Internal audit; Effectiveness; Factors; Perception; Public administration; Factor analysis; Cluster analysis.

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1 INTRODUCTION

Internal auditing (IA) is an important tool for supporting managers in the decision-making process. Since the purpose of IA is to help organizations achieve their objectives, by assessing and improving the effectiveness of risk management, control and governance processes (IIA, 2009). these units have the potential to provide input that can add value to decision-making and ensure satisfactory results (Castro, 2018).

For this reason, internal auditors have been seeking to improve the way IA units work, with a view to enhancing their ability to deliver effectively. In this context, studies on organizational factors have emerged, in which researchers have sought to understand which factors have the greatest influence on the effectiveness of IA performance.

According to Abdelrahim and Al-Malkawi (2022, p. 2), the concept of “factors that influence internal auditing” is understood as those that are substantial for auditing to perform its function, are important for its effectiveness and can affect it. Studies around the world have been conducted to understand the factors that determine the effectiveness of IA from different lenses (Arena & Azzone, 2009; Lenz & Hahn, 2015; George, Theofanis & Konstantinos, 2015; Dellai & Mohamed, 2016; Azzali & Mazza, 2018; Almahuzi, 2020; Abdelrahim & Al-Malkawi, 2022; Grima, Baldacchino, Grima, Kizilkaya, Tabone & Ellul, 2023). In Brazil, however, studies on the subject are scarce, and there is plenty of scope for research, especially in the public sector.

Thus, this research aimed to understand, among the organizational factors that influence the effectiveness of Internal Audits, which are perceived as the most relevant, that is, which can impact IA's ability to add value to the organization, focusing on the Brazilian public sector.

2 INTERNAL AUDITING: CONCEPTS AND FUNCTIONS

According to the Institute of Internal Auditors, based on the *International Professional Practices Framework* (IPPF), Internal Auditing is defined as an independent, objective assurance and consulting activity, whose objective is to add value and improve an organization's operations, contributing to the accomplish of objectives (IIA, 2009). To this end, a systematic, disciplined approach is used, focusing on evaluating and improving the effectiveness of risk management, control and governance processes.

Thus, in its process of action, IA generally identifies areas in which the organization can achieve significant operational improvements, or which are not managing risks effectively. Therefore, while maintaining its autonomy and using its skills, the audit helps management solve important problems by analyzing, identifying and proposing solutions that will be chosen and implemented by management (IIA, 2009; Lélis & Pinheiro, 2012; IIA, 2016; Castro, 2018; IIA, 2019).

In this scenario, the effectiveness of IA has proven to be a very important issue, especially in terms of supporting decision-making (Dias, 2017; Castro, 2018). If senior management considers IA to be ineffective, then its reports will probably be of little value. Furthermore, when IA performs its function effectively, it plays a fundamental role in improving the organization's governance and is an important element in helping the

organization achieve its objectives (Dhamankar & Khandewale, 2003; IIA, 2010). It is therefore important to understand the different factors that can influence the effectiveness of IA performance.

Although there is no consensus on an ideal model of factors or dimensions that reflect the effectiveness of IA, some factors are generally pointed out, such as IA resources and competencies, IA processes and the relationship between IA and stakeholders (Arena & Azzone, 2009; Dellai & Mohamed, 2016; Abdelrahim & Al-Malkawi, 2022).

3 METHODOLOGY

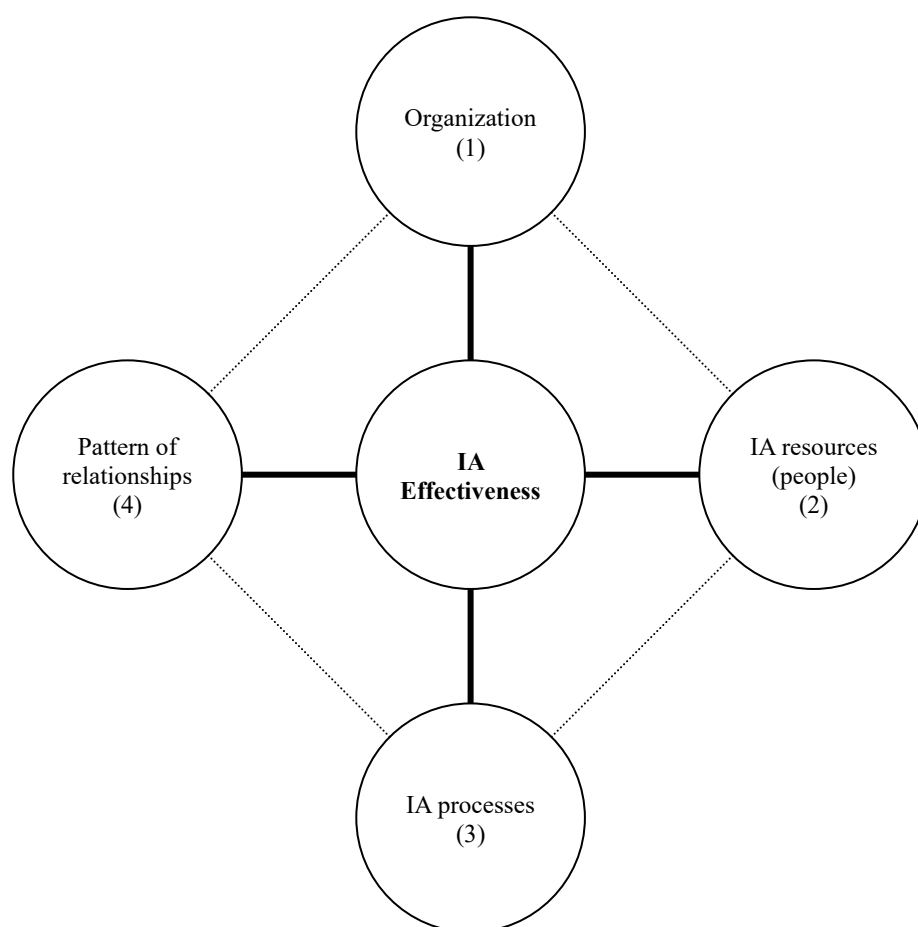
3.1 Theoretical reference

In order to achieve the objectives of this research, we chose to use the model proposed by Lenz (2013). It was found that the author carried out an extensive study of literature and academic research, consolidating the various aspects that can affect the effectiveness of IA in a model with four dimensions. Furthermore, it was noted that the model proposed by Lenz (2013) is referenced in several studies due to its methodological robustness (Azzali & Mazza, 2018; Almahuzi, 2020; Joshi, 2020; Abdelrahim & Al-Malkawi, 2022).

In a view of key factors or “building blocks”, Lenz's model (2013) suggests the following dimensions that shape the effectiveness of Internal Audit (Figure 1):

- 1) Organization, referring to issues of governance and the establishment of the IA activity (Abdolmohammadi, 2009; Abdelrahim & Al-Malkawi, 2022);
- 2) IA resources (people), relating to the characteristics of people – the individual auditor and the IA as a whole (Lenz, 2013);
- 3) IA processes, associated with the activities intrinsic to the performance of the audit practice (IIA, 2010; Lenz, 2013); and
- 4) Pattern of relationships, based on the premise that the effectiveness of other key governance stakeholders, such as senior management and the board, affect the effectiveness of the audit (IIA, 2010).

Figure 1. Dimensions related to the effectiveness of Internal Audit



3.2 Sample and data collection

The data collected was based on a structured questionnaire sent to 106 Chief Audit Executives (CAE) working at Brazil's Federal Universities and Higher Education Institutions that are part of the Brazil's Federal Education Network. A total of 62 responses were received, which is equivalent to a return rate of 58.5%.

The criteria used to define the profile of the sample considered the scope of the researchers' work. In this sense, we chose to focus the application of the questionnaire on Internal Audits linked to Federal Universities and Institutions that are part of the Federal Network of Professional, Scientific and Technological Education, part of the Brazilian federal education system. Special consideration was given to demographic characteristics for the sampling profile, given that the institutions selected are present in all of Brazil's states. In this context, and in view of the research objectives, it was felt that the *loci* chosen allowed the phenomenon to be explored within the Brazilian public sector, with a focus on public organizations in the indirect administration that have AI units.

Although the sample selected allows the phenomenon to be observed in a specific context and contains representatives from different Brazilian states, it is understood that future studies could benefit from expanding the sample size, which would make it possible to find more significant connections and extrapolate the results to a specific population, comparing different contexts in order to better understand the topic, by also applying the survey to the private sector, and broadening the demographic profile, by applying the survey to different countries and possibly comparing the results.

The questionnaire used in the survey consisted of 41 questions (variables) structured into two blocks. The first block included seven questions to characterize the training and experience of the interviewees and the organizations they work for. The second block of questions measured the perception of CAE based on 34 questions associated with the four dimensions proposed by Lenz (2013): 1) Organization (7 questions); 2) IA resources (10 questions); 3) IA processes (10 questions); and 4) Pattern of relationships (7 questions).

The scale used was the semantic differential scale, which allowed the CAE to position his perception of the aspects that can affect the effectiveness of IA between the extremes of "not relevant" and "completely relevant" on a seven-point itemized scale. To facilitate discussion of the results, the following attributes were used as points on the scale: 1) no relevance (SEM); 2) not very relevant (MPO); 3) little relevance (PCO); 4) indifferent (IND); 5) relevant (REL); 6) widely relevant (AMP); 7) totally relevant (COM).

The data was collected using a questionnaire sent out on Google Forms. The data obtained was then extracted, processed and loaded into IBM®, SPSS® Statistics 20 and Statistica™ software, with a view to descriptive statistical analysis related to the profile of the participants, as well as multivariate statistical analysis, which allowed the research objectives to be explored.

3.3 Analytical instrument

In order to achieve the research objective, the Factor Analysis (FA) technique was initially applied, which helped to examine the interconnections between the variables in the model, making it possible to reduce them and estimate the indicators that represented the influence of organizational factors on the effectiveness of IA. After analyzing the degree of bivariate and partial correlation between the variables (a preliminary step to identify the suitability of the variables for applying the FA), the number of factors was extracted and determined using the *Principal Components Analysis*. The factors were then rotated using the orthogonal method and *Varimax rotation*, making it easier to interpret the results. Finally, the set of variable values were synthesized into a single measure using multiple scales (Hair, Anderson, Tatham & Black, 2005).

Once the indicators had been estimated using FA, cluster analysis (CA) was used to group the indicators into clusters based on their similarity, making it easier to identify their degree of relevance. The clusters were formed using a hierarchical procedure, using *Ward's method*. The Squared Euclidean Distance was used as the measure of similarity, as this is the recommended measure for Ward's grouping method (Hair et al., 2005). In the end, the results obtained were shown graphically in a dendrogram (or tree diagram).

4 RESULTS

4.1 Characterization of participants and organizations

The survey sample consisted of 106 heads of Internal Audit units working at Federal Universities and Federal Network Institutions. Table 1 shows the results obtained from the questions related to the participants' demographic information, including level of education, area of training and organizational data. Participants were also asked about how long they had worked in the public sector and how much experience they had in the IA area.

Table 1. Characteristics of participants and organizations

Variables	Alternatives	No.	%
Characteristics of the interviewees			
Level of education	Professional Degree	18	29.03%
	Master's Degree	36	58.06%
	PhD	8	12.90%
Area of training	Exact and Earth Sciences	1	1.61%
	Humanities	15	24.19%
	Applied Social Sciences	44	70.97%
	Engineering	2	3.23%
Time working in the public sector	Up to 5 years	1	1.61%
	6 - 10 years	20	32.26%
	11 - 15 years	23	37.10%
	16 - 20 years	7	11.29%
	More than 20 years	11	17.74%
Time working in the IA area	Up to 5 years	8	12.90%
	6 - 10 years	26	41.94%
	11 - 15 years	21	33.87%
	16 - 20 years	3	4.84%
	More than 20 years	4	6.45%
Experience as CAE	Yes	62	100%
	No	0	0%
Characteristics of the Organization			
Number of employees (civil servants and collaborators) working in the organization	301 - 500	2	3.23%
	501 - 800	3	4.84%
	801 - 1000	3	4.84%
	More than 1000	54	87.10%
Number of employees (civil servants and collaborators) working in IA	Up to 5	33	53.23%
	6 - 10	26	41.94%
	11 - 15	3	4.84%

Most of the participants have a degree in Applied Social Sciences (70.97%), with 58.06% having a master's degree and 12.90% a PhD. In addition, all participants have at least one specialization. These results point to a high level of training among audit managers.

In all, 66.13% of the participants have worked in the public sector for more than ten years. However, approximately 55% have no more than ten years' experience in the Internal Audit area.

As for the organizations in which Internal Audit is involved, the majority are large organizations with more than 1,000 employees (87.10%). However, a considerable number of organizations (53.23%) have a small internal audit department (up to five internal auditors).

4.2 Estimated indicators

The result obtained by factor analysis (FA), based on the regrouping of the 34 variables associated with the four dimensions proposed by Lenz (2013), is shown in Table 2. The FA allowed the initial 34 variables to be reduced into 16 factors expressing the four dimensions of Lenz's model (2013), resulting in a parsimonious set of indicators representing the influence of organizational factors on the effectiveness of IA.

Table 2. Factor Analysis results

Variables			
Dimension	Before FA	After FA	
Organization	IA has a charter	IND_EST	Independence of the IA
	IA charter was agreed upon by the board		
	IA is a legal requirement		
	The size of the IA is proportional to the size of the organization	APO_ADM	Senior management support for the IA
	The IA has its own budget		
	Overall corporate governance context is strong or very strong		
	The use of IA as a management training ground	AI_TREI	IA as a management training ground
IA resources (people)	IA staff receive training related to governance, risk, fraud and ethics at least every two years	COMP_EQP	Competence of IA staff
	IA staff receive leadership-related training at least every two years		
	Possibility of outsourcing the IA		
	CAE has a professional IA qualification	CERT_MEMB	Professional qualification of IA staff
	IA staff are required to have a professional IA qualification		
	IA staff has 40 hours or more of training per year	DES_CONT	Continuous professional development and experience of IA staff
	IA staff stay at least 3 years in the IA		
	Tenure of the CAE in its current role ranges from three to seven years	MAND_CAE	Tenure of the CAE
	Next career move of IA staff is usually a lateral move or a promotion	PROM_EQP	IA staff promotion
	CAE being a senior auditor	EXPE_CAE	CAE being a senior auditor
IA processes	IA uses Computer Assisted Auditing Techniques	TEC_PRO	Use of techniques to optimize the IA process
	Risk-based IA is applied to determine the priorities of the IA activity		
	IA has mechanisms for taking preventive action against the organization's risks		
	IA makes recommendations for improving the governance process	AI_GOV	The role of IA in governance improvement
	IA evaluates the effectiveness of risk management		
	IA maintains a quality assurance and improvement program	QUAL_AI	IA quality assurance
	IA has carried out at least one quality self-assessment in the last two years		
	Assurance mapping is used to identify assurance providers for key risks	PLAN_AI	IA planning process
	Board provides input to the IA plan		
	IA follows-up on the status of issues at least twice a year	MONI_REC	IA recommendation follow-up
Pattern of relationships	IA can consult or rely on the support of the federal government audit	APO_OC_ADM	Federal government audit support and acknowledgement and direct reporting to senior management
	External auditors rely on the work performed by the IA		
	CAE reports formally to senior management quarterly (at a minimum)		
	CAE has appropriate access to senior management		
	CAE has an administrative reporting line to the board	REPT_CA	CAE has a functional reporting line to the board
	CAE has a functional reporting line to the board		
	CAE meets formally with the board quarterly (at a minimum)		

As can be seen from Table 2, the reduction in the number of variables in each dimension was of the following magnitude and with the respective loss of information:

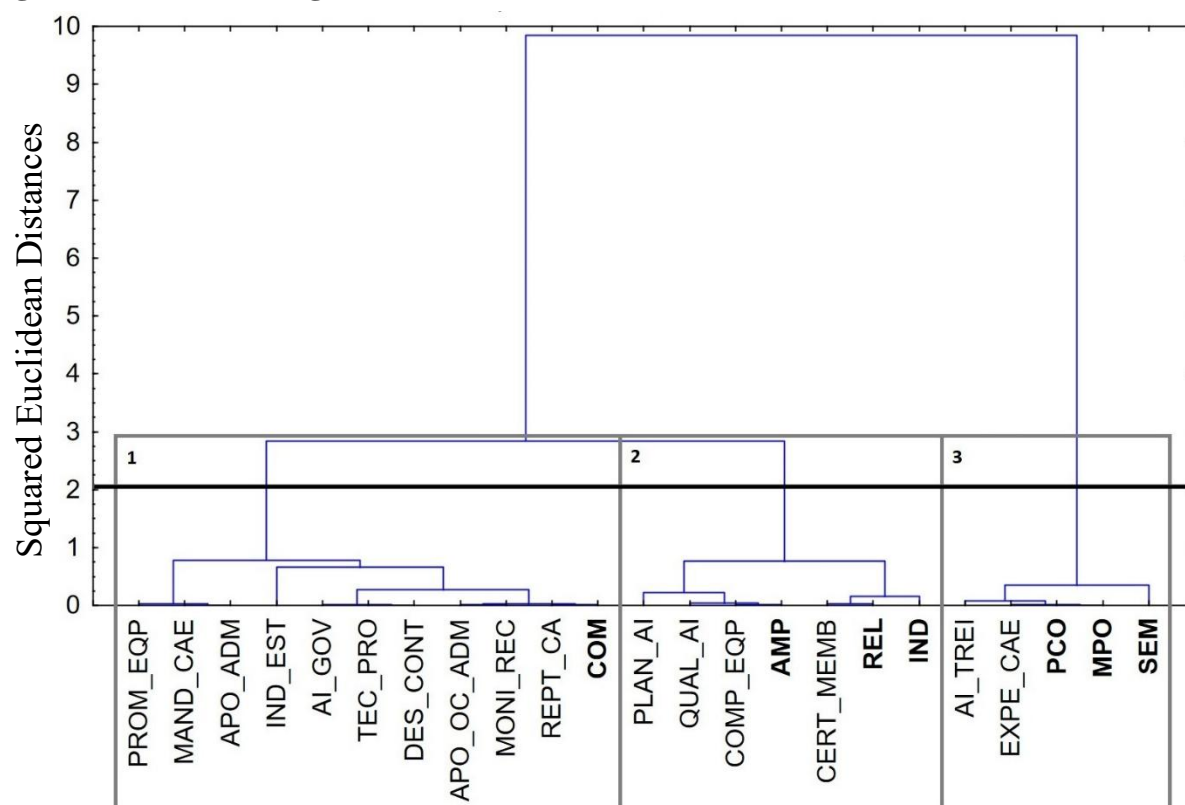
- 1) Organization: 7 variables grouped into 3 factors that explained 80% of the initial variance;

- 2) IA resources (people): 2 variables not suitable and excluded from the factor solution (considered individually) and 8 variables grouped into 4 factors that explained 81.5% of the initial variance;
- 3) IA processes: 1 variable not suitable and excluded from the factor solution (considered individually) and 9 variables grouped into 4 factors that explained 82.3% of the initial variance; and
- 4) Pattern of relationships: 7 variables grouped into 2 factors that explained 65.4% of the initial variance.

4.3 Determinants of Internal Audit effectiveness

The results of the CA, assuming a *Euclidean distance* of 2 (two) as the cut-off line, made it possible to classify the indicators extracted from the FA into three groups of relevance: 1) *completely relevant*; 2) *partially relevant* and 3) *not very relevant* (Figure 2).

Figure 2. Indicator's degree of relevance¹



The results show that several indicators, from all the dimensions or factors of the model studied, were perceived as relevant or completely relevant in influencing the effectiveness of IA, in line with the results obtained in similar studies (Arena & Azzone, 2009; Badara & Saidin, 2013; George, Theofanis & Konstantinos, 2015; Lenz & Hahn, 2015; Dellai & Mohamed, 2016; Abdelrahim & Al-Malkawi, 2022; Grima et al., 2023).

Among the indicators perceived as “completely relevant” are issues associated with the IA's relationship (with senior management, the board and control bodies), the IA's independence, the Audit's processes (especially the monitoring of recommendations and the use of techniques to optimize processes), the continuous development of the IA team and the mandate of the CAE.

In the “Organization” dimension, the indicators “Independence of the IA” (IND_EST) and “Senior management support for the IA” (APO_ADM) were shown to be highly relevant to the effectiveness of IA.

As a principle of IA activity, independence, reflected by the IND_EST indicator, appears to be strongly related to effectiveness, so that the studies found showed that the greater the independence and objectivity of the

¹ Groupings: 1: Completely relevant; 2: Partially relevant; 3: Not very relevant; Scales: SEM - Not relevant; MPO - Very little relevant; PCO - Not very relevant; IND - Indifferent; REL - Relevant; AMP - Largely relevant; COM - Completely relevant.

IA department, the greater its effectiveness (Alizadeh, 2011 as cited in Dellai e Mohamed, 2016). This strong correlation was also pointed out by Ussahawanitchakit & Intakhan (2011), Almahuzi (2020), Bedasso & Asfaw (2020) and Nagriwun & Frimpong (2023). It is therefore important for organizations to ensure that the IA can act independently, for example, by formally creating the Audit Office and having its charter approved by the organization's Board of Directors or similar body.

The APO_ADM indicator, based on the factors associated with it, appears in other studies (Arena & Azzone, 2009; George, Theofanis & Konstantinos, 2015; Lenz & Hahn, 2015; Almahuzi, 2020; Bedasso & Asfaw, 2020; Abdelrahim & Al-Malkawi, 2022; Grima et al., 2023; Nagriwun & Frimpong, 2023), referencing how committed the organization is to the IA's work and showing that management support has a lot of influence on its effectiveness. Thus, it is necessary to ensure, for example, that the size of the IA is proportional to the size of the organization and that the IA has its own budget (Lenz & Hahn, 2015).

In the "IA Resources" dimension, the factors "Continuous professional development and experience of IA staff" (DES_CONT), "Tenure of the CAE" (MAND_CAE) and "IA staff promotion" (PROM_EQP) were indicated as completely relevant.

With regard to continuous development based on a minimum workload, this is a practice reinforced by international standards (IAASB, 2012; IIA, 2019). However, despite the existence of a relationship between the continuous development of the auditor and the effectiveness of IA (Ussahawanitchakit & Intakhan, 2011; Almahuzi, 2020), suggested by the results, studies on the subject point out that simple compliance with this workload has not proven to be a guarantee of improved effectiveness (Arena & Azzone, 2009; Cohen e Sayag, 2010 as cited in Dellai e Mohamed, 2016; Dellai & Mohamed, 2016; Ta & Doan, 2022). This is explained by Lenz and Hahn (2015), who mention that capabilities and competencies, although essential for the performance of the IA function, can be of little value when they are not compatible with the organization's culture or when the services provided are not desired.

Regarding the CAE's tenure (MAND_CAE), it should be noted that this is a factor associated with the maintenance and independence of the IA (Lenz, 2013; Almahuzi, 2020), and is therefore directly related to effectiveness, as already mentioned in the "Organization" dimension.

As for the factor of member promotion (PROM_EQP), the study by Burton et al. (2015) found no association between this factor and IA effectiveness. In this way, the possibility of internal promotion can be seen more as a good management practice than as an element of effectiveness.

In the "IA Processes" dimension, the indicator "IA recommendation follow-up" (MONI_REC) was pointed out as having a great deal of influence on IA effectiveness. Studies show that the monitoring of recommendations and their implementation by management are of great importance, as they reflect management's support for IA processes (Almahuzi, 2020; Grima et al., 2023).

Also in the "IA Processes" dimension, the indicators "Use of techniques to optimize the IA process" (TEC_PRO) and "The role of IA in governance improvement" (AI_GOV) were pointed out as completely relevant, which is in line with standards on the subject (IAASB, 2012; Brasil, 2017a; IIA, 2016 and 2019) and with research in the area (Sarens, Abdolmohammadi & Lenz, 2012; Pedrosa, Laureano & Costa, 2015; Almahuzi, 2020; Grima et al., 2023).

For the TEC_PRO indicator, we found guidelines from different international organizations on the importance of using technology tools to improve the efficiency and effectiveness of audit processes (IAASB, 2012; IIA, 2016), as well as studies showing the impact of Information Technology (IT) on IA activities. In addition to broadening the scope of action, IT support improves the efficiency and security of results (Pedrosa, Laureano & Costa, 2015), positively impacting the effectiveness of IA (Almahuzi, 2020). Also noteworthy was the application of the risk-based audit techniques listed both by international organizations and national auditing standards (Controladoria-Geral da União, 2017a; IIA, 2019), as well as in studies by Sarens, Abdolmohammadi & Lenz (2012) and Grima et al. (2023). Finally, preventive action (*a priori*) was another optimization technique highlighted in the literature as relevant to increasing the effectiveness of IA (Deloitte, 2020; Almeida, Jesus & Cabello, 2023).

Regarding the AI_GOV indicator, the IA's role in improving governance, the explanation found for its high relevance is based on the IA's own mission: to improve governance processes, as highlighted by the (2009) and Badara & Saidin (2012).

In the "Pattern of relationships" dimension, the two existing indicators were perceived as completely relevant ("CAE has a functional reporting line to the board" - REPT_CA and "Federal government audit support and acknowledgement and direct reporting to senior management" - APO_OC_ADM). In relation to the REPT_CA indicator, it is very important to maintain the independence of the IA, so the idea of dual reporting strengthens the independence of the audit and has a major impact on its effectiveness, an aspect highlighted both by international standards (IIA, 2016; IIA, 2019) and by researchers (Arena & Azzone, 2009; Cohen e Sayag, 2010 as cited in Dellai e Mohamed, 2016; George, Theofanis & Konstantinos, 2015).

As for the support and acknowledgement of federal government audit (APO_OC_ADM), the literature is scarce, possibly because countries have different characteristics in their administrative structure. In Brazil, the

Controladoria-Geral da União, as the central body of the Internal Control System, emphasizes the importance of technical supervision (Presidência da República, 2000; Controladoria-Geral da União, 2017a; Controladoria-Geral da União, 2017b); while Brazil's Federal Constitution states that the internal control system should support external control, a fact perceived as positive in study by Grima et al. (2023). In this sense, the perception that the support and recognition of control bodies play an important role in the effectiveness of IA highlights the relevance of this supervision, which has the role of bringing convergence to government IA practices and alignment with external control.

As for the indicators perceived as less relevant to the IA's effectiveness, issues related to the IA's use as management training ground (AI_TREI), the IA's CAE being a senior auditor (EXPE_CAE) and the professional qualification of IA staff (CERT_MEMB) stood out.

Regarding the AI_TREI indicator, included in the "Organizations" dimension, it can be seen that this is a common practice in Anglo-Saxon countries, but not in Brazil, especially in the case of the public service. This is also reflected in the literature, which shows no consensus on the relationship between this practice and IA effectiveness (Burton et al., 2015; Dellai & Mohamed, 2016), as well as authors who see the practice as less advantageous, pointing to the reduction of IA's independence and objectivity (Chadwick, 1995 as cited in Dellai e Mohamed, 2016; Goodwin & Yeo, 2001).

As for the EXPE_CAE indicator, from the "IA Resources" dimension, no studies were found that specifically associated the experience of the chief auditor with IA effectiveness (Arena & Azzone, 2009; Dellai & Mohamed, 2016). Thus, the perception of this indicator as having little relevance was consistent with the literature.

With regard to the indicators "Professional qualification of IA staff" (CERT_MEMB) and "Competence of IA staff" (COMP_EQP) being indicated as not very relevant, it can be said that this perception is possibly justified by the fact that the search for certifications is not so common in the Brazilian public sector and that training involving leadership is relatively recent and is not commonly addressed in the country's auditing standards. As for certifications, there is no consensus in the literature (Arena & Azzone, 2009; Lenz, 2013) as to their relationship with the effectiveness of IA, despite the fact that they are strongly recommended by auditing bodies such as the IIA.

Finally, the indicators associated with IA quality assurance (QUAL_AI) and IA planning process (PLAN_AI). Although both are strongly recommended by the standards applied to IA, studies do not point to a direct relationship between these processes

and the effectiveness of IA (Grima et al., 2023; Lenz, 2013), corroborating the results obtained in this study.

5 CONCLUSIONS

Based on the model proposed by Lenz (2013), on the dimensions related to the effectiveness of Internal Auditing, the aim of this study was to identify the most important organizational indicators for the effectiveness of Internal Auditing (IA). The data refers to the perception of chief auditors working in Federal Higher Education Institutions, therefore within the context of the Brazilian public sector. To this end, Factor Analysis (FA) and Cluster Analysis (CA) techniques were used.

The FA made it possible to group and simplify the initial indicators, reducing the number of initial variables by 53% (34 variables for 16 main indicators) with a loss of information of 23%, on the average of the four factorial solutions achieved. The importance of the FA was to identify a parsimonious and representative set of indicators that could be used in the CA. The CA allowed the indicators to be ranked in three degrees of relevance: 1) *completely relevant*; 2) *partially relevant*; and 3) *not very relevant*.

In general, the results obtained are in line with the reference literature, in which the indicators perceived as the most relevant are supported by various references, while the less relevant ones have explanations and have also been corroborated by some authors. In general, the results for the Brazilian public sector context are in line with international research findings.

Factors related to the IA's pattern of relationship with key stakeholders (such as senior management and boards of directors), the IA head's mandate and the IA's independence, combined with senior management support, were perceived as the most relevant to the IA's effectiveness. Thus, for IA to play an active role in improving organizational governance, special attention needs to be paid to the aforementioned indicators.

In addition, factors related to the optimization of IA processes, especially the use of computer techniques, risk-based auditing and the monitoring of recommendations, were strongly related to its effectiveness.

The development of auditors was also pointed out as a crucial aspect. However, aspects such as the use of IA as a training ground and the achievement of individual auditor certifications were not perceived as being relevant in the context studied, which may reflect particularities of the Brazilian public sector.

Limitations to the research include the sample being restricted to universities and federal higher education institutions. Therefore, caution should be exercised when applying these results to other contexts, suggesting the

need for replication in other public and private sector contexts. Furthermore, future studies may benefit from the inclusion of the perceptions of managers and others involved in the process.

The study contributes to an understanding of the organizational factors that impact the effectiveness of IA in public institutions and can guide improvements in the structuring and management of these units. The conclusions drawn from the research suggest that the allocation of resources should focus on the most relevant indicators to optimize the effectiveness of IA, thus impacting on its ability to add value, improve an organization's operations and strengthen governance processes.

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