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Internal audit quality: perceptions of Tunisian internal auditors an explanatory research

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Abstract

Purpose – The purpose of this study is to understand how internal auditors perceive the internal audit quality and to highlight the different profiles of internal auditors based on their perception of internal audit quality determinants.

Design/methodology/approach – The authors' methodological approach is based on the submission of a self-administered questionnaire. The final sample consists of 104 internal auditors. The first stage of the study is in the lead of a certified public accountants (CPA), which highlights seven factors of the internal audit quality. The second step is a confirmatory factor analysis (CFA) that allowed the authors to validate the model proposed by the CPA. Finally, the authors carry out a typological analysis of the auditors according to their way of perceiving the factors extracted by the CPA.

Findings – The authors' model, validated by the CFA, shows that the knowledge of the internal auditor, the independence of reporting, compliance with professional standards of internal audit, the relationship with the external auditor, the personal relationship of the internal auditor, the access to information and the field of intervention of the internal auditor have a positive association with the internal audit quality but with a different degree of significance. For example, the field of intervention of the internal auditor and the access to information explain better the internal audit quality. However, the knowledge of the internal auditor and the relationship with the external auditor are not significant to explain the internal audit quality. From the hierarchical cluster analysis, four groups of internal auditors emerged: the autonomous, the perfectionists, the rigorous ones and the objectives.

Originality/value – In offering these findings, the paper contributes to the existing internal audit literature by introducing evidence from an emerging country, namely, Tunisia, of the internal audit quality model. In addition, the authors proposed a new measure to the internal audit quality model which is the use of the work of the internal auditor by the external auditor. This study is also interesting to managers and professional internal audit organizations in recognizing the characteristics of the quality of the internal audit and advance reflections on the effectiveness of internal audit practices. The authors' study proposes a typology of certified internal auditors through their perceptions of the quality of the internal audit while taking into account the specificities of the Tunisian audit market. This provides insights to managers and audit committees on the measures necessary to ensure the relevance of the internal audit work within their companies.

Keywords CPA, CFA, Internal audit quality, Typologies of internal auditors

Paper type Research paper

1. Introduction

The financial scandals that have shaken the economic world proved the importance of an effective internal audit function to deal with fraudulent behavior [1]. This conducts a crisis of confidence that reinforced the role of the audit function and its role in the corporate governance process. Managers often use internal auditors to help them make sure that: risks are identified and monitored, organizational processes are adequately controlled, and organizational processes are effective and efficient.

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The internal auditing literature started by Sawyer (1973), who defined internal auditors as the "eyes and ears of managers" that can access and give assurance on the effectiveness of the organization's internal control system. This has strengthened the demand for a quality internal audit to enable good decision-making. This approach to an internal audit, focusing on the effectiveness of the internal control system, has expanded to include risk management and corporate governance (Walker *et al.*, 2003). Internal auditors, therefore, can add value to the entity by providing assurance that its risk exposure is well understood and managed (Walker *et al.*, 2003). In this regard, studying the internal audit quality becomes an interesting subject for discussion.

The purpose of this study is to understand how internal auditors perceive internal audit quality and to highlight the different profiles of internal auditors based on their perception of internal audit quality determinants. This brings us to ask our main question as follows: What are the attributes of the different profiles of Tunisian internal auditors? Our fundamental proposition is to develop a scale of measurement of internal audit quality according to the auditors' perception. Our methodological approach is based on the submission of a self-administered questionnaire to internal auditors in Tunisia.

To date, few studies examined factors explaining the internal audit quality. Several researchers have assessed the internal audit quality indirectly through the relation between the performance and effectiveness of the internal audit function within an organization and several characteristics such as the sector of the organization (Goodwin, 2003, 2004), the qualities of the internal auditor (Al-Twaijry *et al.*, 2004; Van Peursem, 2005) and the cooperation between the internal and the external auditor (Oliverio and Newman, 1991; Schneider, 2009; Endaya, 2014).

Therefore, rare are the works that have used the term internal audit quality. In addition, our study differs from the previous literature, in terms of instruments for measuring the internal audit quality. The quality of the internal audit is not measured by the use of the work of the internal auditor by the external auditor. We, therefore, propose to introduce this measurement. In addition, most of these studies are mainly carried out in the context of developed countries (Prawitt *et al.*, 2009; Pizzini *et al.*, 2015). It is only recently that few studies on this subject have turned to the context of emerging countries such as the study by Al-Shetwi *et al.* (2011). According to Kinney (2000), one of the main reasons is the lack of data on internal audit and audit committee practices, especially in the context of emerging countries. A framework that criticizes the weakness of corporate governance and its lack of maturity (Klibi, 2015). These shortcomings make it difficult to observe internal audit practices and analyze their effectiveness directly.

Our context of research is also extensive in that few studies have attempted to combine the characteristics of the internal audit quality and the profiles of internal auditors according to their perceptions in an emerging context. So, we propose to extend the field of analysis of this research field in the Tunisian context. This extension is appreciated on two levels: First, the case of Tunisia reflects the economic, institutional and cultural realities of emerging countries. We believe that the governance culture of Tunisian firms seems to be representative of that of developing countries and which is in no way similar to that of firms established in developed countries. Thus, the choice of the Tunisian context turns out to be interesting insofar as we have witnessed in Tunisia in recent years, significant changes in corporate governance. In fact, previous studies have found that the internal audit function is a mechanism for fighting fraud, managing results and thus conflicts of interest. For example, Prawitt *et al.* (2009) found that the quality of the internal audit function makes it possible to limit the upward management of the result. Some other, more rare, mainly Anglo-Saxon studies attempt to clarify that it is rather the quality of the internal audit that

constitutes the lever for action enabling the establishment of a statement of accounting quality (Pizzini *et al.*, 2015; Abbott *et al.*, 2016; Lin *et al.*, 2011; Carcello *et al.*, 2011; Prawitt *et al.*, 2009). Based on the results of experimental studies and previous surveys, Gramling *et al.* (2004), argued that the internal audit function has the potential to affect the quality of corporate governance, the quality of financial reporting and the performance of companies. Tunisia, whose economic, financial and political environment has experienced some financial and political scandals, has just strengthened the regulations linked to audit and internal control practices to protect the interests of investors and restore market confidence.

In Tunisia, the regulations concerning internal audit and audit committee practices are recent (1994, 2001 and 2005, completed in 2006) and result in two-tier legislation with a distinction between listed and unlisted companies and different requirements depending on whether they meet the numerical limits set by specific decrees. We can cite for example: The general accounting standard of the business accounting system 1997 Article 38 of the general rules of the Stock Exchange; banking sector standard No. 22; Law 2001–65 July 2001 relating to credit institutions and banking operations; Law No. 2005–96 of October 18, 2005 on strengthening the security of financial relationships; the circular relating to credit institutions *n* ° 2006–19 of November 28, 2006 relating to internal control.

More recently, for the sake of transparency and financial security, the work initiated by the Tunisian Center for Corporate Governance in collaboration with Institut Arabe des Chefs d'Entreprises (IACE), The Center for International Private Entreprise (CIPE), Organisation for Economic Co-operation and Development (OECD) and International Finance Corporation (IFC) led to the publication in 2007, a "Guide to good Tunisian corporate governance practices." This document, updated in 2009 and in 2012, is referenced at the European Center for Corporate Governance and with international organizations such as the OECD.

This study contributes to enhance the role of the internal audit function as well as the responsibilities of the internal auditor as a governance mechanism within the company. Indeed, our findings show that the independence of the internal auditor, the standard compliance and the relationship with the external auditor are the factors that best explain the internal audit quality in the Tunisian context. These results should encourage managers, audit committees and external as well as internal auditors in Tunisia to strengthen the internal auditor–external auditor relationship, to be based on mutual trust and frequent interactions. This is relevant to consolidate strong management and board support for the internal auditor. This will allow for a dynamic and agile internal audit function, which can be an indispensable resource to support a sound governance.

Our study is also interesting to managers and professional internal audit organizations, who can, at the end of this work, recognize the characteristics of the quality of the internal audit and advance reflections on the effectiveness of internal audit practices. Indeed, this study proposes to provide explanations for Tunisian companies who wish to improve the efficiency of their internal audit function. In other words, by identifying the determinants of the internal audit quality and of the different profiles of internal auditors and how they perceive the quality of the internal audit, this research provides insights to managers and audit committees on the measures necessary to ensure the relevance of the internal audit work within their companies. As a result, the quality of the information conveyed through internal audit reports is improved. This translates into a positive development in the performance of the company and its growth opportunities. Next, we propose a typology of internal auditors evaluated through their perceptions of the quality of the internal audit, while taking into account the specificities of the Tunisian audit market.

The remainder of this paper is organized as follows: Section 2 exposes an overview of the literature review. Section 3 presents the research methodology and the discussion of the results. Finally, Section 4 concludes the paper and gives some limits of the study.

2. Literature review and conceptual framework

The review in internal audit is full of work that has studied the concepts of performance and effectiveness of the internal audit. However, very rare are the works that dealt with the concept of "the internal audit quality" explicitly. In our study, internal audit quality characterization will rely on determinants from the literature, namely, the personal qualities of the internal auditor such as competence and independence and determinants unrelated to the individual qualities of the internal auditor such as the external auditor cooperation and the sector (private-public).

2.1 Cooperation between external auditor and internal auditor

Professional organizations for audits, such as the International Federation of Accountants, the American Institute of Certified Public Accountants (AICPA) and The Institute of Internal Auditors (IIA), have recognized the importance of the internal audit function and its contribution to external auditors' works.

Most founds of studies improve that between external and internal auditors it is necessary to be a good cooperation and coordination (Oliverio and Newman, 1991; Schneider, 2009; Endaya, 2014).

In recent years, professional bodies such as AICPA (SAS No. 53, SAS No. 82, and SAS No. 99) and IIA (IIA, 2012, Sec. 1210. A2) have required both internal and external auditors for the importance of fraud detection (Coram, Ferguson and Moroney, 2008).

The importance of the role that internal auditors play in the overall audit process has attracted the attention of several researchers who have tried to analyze the interaction between internal auditors and external auditors (Schneider, 2009; Zain *et al.*, 2006; Cohen *et al.*, 2002; Felix *et al.*, 2001; Wallace, 1984).

This interest was mainly motivated by three factors. First, the pressure on audit firms following the failure of Arthur Anderson in 2002. Second, there was the need for external auditors to improve the quality of their engagements and reduce them. cost through optimizing the work performed by internal auditors. As for the third factor, this stems from the evolution of the concept of corporate governance which has placed more emphasis on the role of the internal audit function in the process of preparing financial reporting (Cohen *et al.*, 2002).

In addition, the activities of internal audit and external audit may converge in certain areas such as the review of the quality of financial reporting. However, the differences between these two areas are greater than the similarities because of the divergent objectives (Sawyer *et al.*, 2003).

Academically, a considerable amount of research has attempted to explore the factors that influence the decision of the auditors to rely on the work of internal audit or not. Much of this research has been conducted in the USA and has primarily examined the explanatory factors and consequences of the use of external auditors in the work of internal auditors (Munro and Stewart, 2010; Schneider, 2009; Glover *et al.*, 2008; Gramling *et al.*, 2004; Al-Twaijry *et al.*, 2004; Felix *et al.*, 2001).

For example, Glover *et al.* (2008) found that external auditors are more likely to rely on the work of internal auditors when they perform objective tasks, as opposed to subjective tasks. This finding was supported by Munro and Stewart (2010). Moreover, with the emergence of audit committees, external auditors seem to have an additional source to help

them assess the effectiveness of internal audit and coordinate with this structure in the collection of audit evidence. Thus, it seems that the internal audit function has great potential to assist the external auditors in their planning and in the accomplishment of their missions.

Other studies point out that the quality of reporting is improved when the external auditors coordinate their efforts with the internal audit function (Pizzini *et al.*, 2015; Lin *et al.*, 2011; Prawitt *et al.*, 2009).

2.2 Internal auditor competence

The assignment of appropriate personnel to the internal audit department and the proper management of these personnel are keys to the proper functioning of an internal audit. An internal audit requires professional staff who collectively have the education, training, experience and professional qualifications to carry out the full range of audits required by their mandate (Al-Twaijry *et al.*, 2004). For this, auditors must comply with the requirements and professional standards published by their professional organizations (IIA, 2016), among others the standards relating to skills and conscientiousness, including the standard 1200 of the IAA, which requires that the missions of the internal auditor must be conducted with competence.

According to standard 1210 of the IAA: The entire audit team must have the knowledge, the know-how and all the skills necessary for the exercise of its responsibilities, in particular: in the application of the norms, audit procedures and techniques, in terms of accounting principles and techniques, in terms of identifying the risks of fraud, risks and controls relating to information technology, in terms of understanding management principles.

Bou-Raad (2000) showed that auditors must have a high level of education to be considered as a human resource. The diversity of skills required, according to Bou-Raad (2000), represents a major challenge for professional bodies, institutions of higher learning and management. The studies that have examined this question has found that the more the professional qualifications of the internal auditors in a given department are defined by the duration of their professional training and their level of higher education, the more this department is efficient and of good quality (Albrecht *et al.*, 1988). Nanni (1984) found that the auditor's experience has a positive effect on the quality of the internal audit.

2.3 Professional standards adherence

The IIA has set out a number of standards called Standards for the Professional Practice of Internal Auditing. The purpose of these standards is to define the principles that the practice of internal audit must follow, to provide a reference framework for the realization and promotion of a wide range of internal audit activities providing added value, to establish the criteria for assessing the functioning of the internal audit and promoting the improvement of organizational processes and operations.

Alzeban (2015) stipulates that adherence with the internal audit standards which demand greater complexity and disclosure in reporting is indicative of higher internal audit quality.

Alzeban (2019), in his study on 142 chief audit executives from Saudi-listed companies, found that companies demonstrating higher internal audit compliance with standards have better financial reporting quality.

This is important not only for compliance with legal requirements but also because the scope of the auditor's duties could involve the assessment of areas of risk in which a high level of judgment is required and audit reports may have a direct impact on decisions adopted by management (Bou-Raad, 2000). It can, therefore, be argued that greater

compliance with the professional standards of internal audit will improve the quality of the audit.

2.4 Internal auditor independence

According to IIA Standard 1110, internal audit must be independent and must perform its work objectively. Otherwise, the internal auditor must not be subject to interference when defining his field of intervention, carrying out the work and communicating the results.

Indeed, the auditor's organizational independence is an important factor in audit quality (Duff, 2004). For this reason, the internal auditor must be of a sufficient hierarchical level within the organization to enable the internal audit department to exercise its responsibilities. It must conform to the board, at least annually, the independence of the internal auditor. Internal auditing within the organization so that it is not achieved, for example, when the internal auditor reports functionally to the Board (Standard 1110).

Van Peursem (2005) identifies a high potential for confusion in the relationship between internal auditors and management: internal auditors need to help managers do their job, and at the same time, independently assess management effectiveness. They are responsible for upholding the best interests of their employer; they must be reluctant to prevent good management whatever the consequences.

Bou-Raad (2000) argued that the strength of an internal audit department should be assessed in relation to the degree of independence it enjoys from management and operational responsibilities.

The IIA, the AICPA and others have also considered organizational independence is crucial to the viability of the internal audit function (Brown, 1983).

Similarly, IIA Standard 1120 requires the internal auditor to be objective, that is to say, to carry out his/her mission in such a way that he/she has confidence in the result of his/her work and in the fact that no significant abundance has been made in terms of quality. The internal auditor should not be placed in situations that would impair their ability to make objective professional judgments.

Van Peursem (2005), in his study based on interviews with Australian internal auditors, concluded that management independence is a dominant feature of successful audit programs. These auditors, able to set their schedule of the day, seem to be more efficient because they are the ones who know how to choose what to check.

2.Internal audit at the heart of agency theory

The literature is replete with studies that have used agency theory to examine the role of the external auditor in the business. However, few researchers have applied this theory to the internal audit function (Ismael and Roberts, 2018).

Indeed, the agency theory is part of the positivist group of theories that follows from the literature of financial economics. This theory postulates that the company consists of a node of contracts between the owners of economic resources and the managers, who are responsible for the use and the control of these resources and therefore to have more information than the directors this creates an information asymmetry which negatively affects the ability of managers to effectively monitor whether their interests are being well served by agents (Jensen and Meckling, 1979; Adams, 1994). Recall that this theory also assumes that directors and agents act rationally and that each of them wants to maximize their wealth even at the expense of the interests of the other party. This can result from dilemmas of moral hazard (selfishness of the agent) and adverse selection (Jensen and Meckling, 1979). To deal with these dilemmas, several mechanisms can be put in place to control the behavior of agents, such as internal audit (Adams, 1994; Ettredge *et al.*, 2006).

According to IIA Standard 1120, internal auditors must be independent and objective. That is to say that they should avoid any situation in which an internal auditor, who enjoys a position of trust, has a personal or professional interest that competes with his duties and responsibilities. Such interests may prevent the auditor from carrying out his or her responsibilities impartially. A conflict of interest may exist even if no unethical or dishonest act has been committed, may create a situation that could damage the internal auditor's confidence in the audit service. Internal and professional can compromise an individual's ability to conduct their activities and exercise their responsibilities objectively. The independence or objectivity of internal auditors can be compromised by personal conflicts of interest, limitations on the scope of an audit, restrictions on access to files, people and property, as well as resource limitations such as financial limitations.

To avoid conflicts of interest, as set out in Standard 1130, internal auditors must refrain from auditing specific transactions for which they were previously responsible. The objectivity of an internal auditor is presumed to be altered when he carries out an insurance assignment for an activity for which he was responsible during the previous year.

3. Research methodology and results

3.1 Data collection and sample size

The empirical approach of this study is based on the submission of a self-administered Likert questionnaire of five scales (showing the agreement or the disagreement of the respondents) addressed to the internal auditors in Tunisia. The choice of the case of Tunisia reflects the economic, institutional and cultural realities of emerging countries. We believe that the governance culture of Tunisian firms seems to be representative of that of developing countries, and which is in no way similar to that of firms established in developed countries. Thus, the choice of the Tunisian context turns out to be interesting insofar as we have witnessed in Tunisia in recent years, significant changes in corporate governance.

The items of the scale of measurement were generated based on scales existing in the literature, which led us to propose a questionnaire of 22 items. The choice of items, and the number of items, is mainly based on two principles. On the one hand, we are inspired by previous work in writing the questionnaire (Van Peursem, 2005; Alzeban, 2019, 2015; Al-Twaijry *et al.*, 2004; Pizzini *et al.*, 2015; Lin *et al.*, 2011; Prawitt *et al.*, 2009), as well as those used in international internal audit surveys (French Institute of Audit and Internal Control, 2013). On the other hand, it should be mentioned that the number of items is statistically linked to the number of responses, in other words number of respondents. It should be noted that the number of internal auditors in Tunisia is limited. The ATAI, the only body of internal auditors in Tunisia, has only 177 internal auditors. It is true that this number does not represent all of the internal auditors in Tunisia, but, taking into account the number of external auditors subscribed on the order of chartered accountants in Tunisia, the community of internal auditors is relatively limited compared to the community of external auditors. Hence, we cannot use a very large number of items for purely statistical reasons.

These items are spread over five dimensions: the first dimension concerns the independence of the internal auditor (09 items); the second dimension concerns adherence to professional standards (02 items); the third dimension concerns the sector of activity (02 items); The fourth dimension concerns the competence of the internal auditor (05 items). The fifth dimension concerns the coordination of the external auditor with the internal auditor (04 items).

The questionnaire was distributed to 230 internal auditors working in Tunisia. The operation took place in July 2016. We collected 110 responses, one with missing data and

one with duplicate responses. After reading the questionnaires collected, we found the existence of four copies that contain very contradictory answers on the same construct. So, we eliminated these answers so as not to bias our results. Hence, we had 104 usable responses giving a response rate of 45.21%.

3.1.1 Descriptive statistics. Table 1 shows that our sample is composed of 76.9%, and 23.1% of women respondents are divided into age groups as follows: 62 respondents or 59.6% are under 35 years of age; 30 respondents (28.8%) are in the 35–45 age range and 12 respondents (11.5%) are over 45 years of age. This shows that the majority of our sample is quite young. Regarding experience in the field of internal audit, 44.2% of respondents have experienced between 3 and 10 years, 26.9% had a career of more than 10 years and 28.8% had less than three years of experience. As for membership in the private or public sector, 76.3% of auditors practice their profession in private institutions against 32.7 who work in the public sector. A total of 82.7% of our sample studied in management sciences compared to 17.3 who did other studies.

3.2 Principal component analysis (PCA)

The exploratory factor analysis was performed using the SPSS 21 software on all 22 items that make up the initial questionnaire. To purify the data, we carried out principal factor analysis (PCA) with Varimax rotation. This rotation indicates that each factor brings unique information, not shared by another factor.

The principal component analysis, at first, does not show a clear factor structure because many items have high contributions to several factors.

To proceed with the purification of the scales of measurement, we eliminate items having no contribution higher to 0.50. This elimination allows keeping only the items that reflect the most important information possible while condensing the scale (four items were not selected). These items concern the private/public sector dimension (two items), one item of

Table 1. Descriptive statistics (Appendix 1, Tables A1.1; A1.2; A1.3; A1.4; A1.5)

Modality	Effective	(%)
Gender		
Female	24	23.1
Male	80	76.9
Age		
Under 35	62	59.6
Between 35 and 45 years	30	28.8
Over 45 years	12	11.5
Experience		
Less than 3 years	30	28.8
Between 3 and 10 years	46	44.2
More than 10 years	28	26.9
Sector		
Private	70	76.3
public	34	32.7
Formation		
Management sciences	86	82.7
Others	18	17.3

the internal auditor independence dimension, and one item of the external auditor coordination dimension.

To choose the number of factors to extract, an analysis of the total variance explained was conducted on the remaining items (18 items).

The software outputs have shown that seven factors have an eigenvalue greater than or equal to 1. We keep them for analysis. The first factor accounts for 22.325% of the total variance of the 18 variables in the analysis. In common, the nine factors explain 69.144% of the variance.

Before interpreting the results of the CPA, we made sure of the quality of the latter to the data used. For this, we calculated the KMO index and performed the Bartlett test. (Table 2)

The KMO index measures the relevance of the CPA. The closer the index value is to one, the more the factorization is the right choice. Small values indicate that factor analysis is not the most appropriate method. According to Kaiser and Rice (1974), a KMO index greater than 0.5 is acceptable. The KMO Index Scale Index for External Auditors is 0.643. This value exceeds the limit of 0.5. So, the items can be factored. We can, therefore, see that our data lend themselves to an ACP.

Then we performed the Bartlett sphericity test, which gives a significance value of 0.000. So, the correlation matrix is not a unit matrix, so there is some correlation between the items. Hence factoring is possible.

3.2.1 Internal consistency or reliability test. The reliability of the measurement scale is verified by calculating Cronbach's α for each factor selected and for the whole scale. The alpha value of Cronbach (α) was 0.768 for all items in the questionnaire. This value is greater than 0.6. So, the overall consistency of the questionnaire is verified. The reliability indices of the response factors in our study are well above the norm of 0.6. They are between 0.739 and 0.990. Cronbach's α is satisfactory, so the elements are correlated and consistent with each other; they can be summed for an old score. (Table 3)

Table 2.
KMO Index and Bartlett test (Appendix 2; Table A2.3)

	Value found
KMO Index	0.643
Bartlett Test	0.000

Note: KMO = Kaiser-Meyer-Olkin

Table 3.
Alpha Cronbach test (Appendix 5; Tables A5.1 to A5.8)

Component	Cronbach α	No. of items
Component 1	0.970	4
Component 2	0.942	3
Component 3	0.979	2
Component 4	0.990	2
Component 5	0.965	2
Component 6	0.885	2
Component 7	0.739	3
Total scale	0.768	18

3.2.2 Factors labeling. The matrix of principal components after rotation shows seven factors.

The first factor identified by the CPA is items dealing with: participation in training programs, audit certification, the use of modern technology and the experience of the internal auditor. This factor represents the knowledge of the internal auditor.

The second factor includes items dealing with: the capacity of the internal auditor to audit the entire system and his ability to intervene in all organizational units and regular internal audit monitoring. This factor represents the field of intervention of the internal auditor.

The third factor includes items dealing with the performance of audit activities without any interference from anyone and the auditor's freedom to include any findings. This factor represents the independence of reporting.

The fourth factor includes items dealing with the maintenance of the internal audit charter and compliance with the standards. This factor represents compliance with professional standards of internal audit.

The fifth factor includes items dealing with cooperation with the external auditor and periodic meetings with the external auditor. This factor represents the relationship with the external auditor.

The sixth factor groups the items are dealing with the relationship of the internal auditor with the Board of directors and the audit committee and its relationship with the management team. This factor represents the personal relationship of the internal auditor.

The seventh factor group's items were dealing with free access to data and its independence to access all data. This factor represents access to information.

3.3 Confirmatory factor analysis

In a second step, we performed a confirmatory factor analysis (CFA) to test the fit and factor structure of the measurement model identified by the exploratory analysis, to verify the convergent validity and reliability of the measuring instrument and finally to test the discriminant validity subscales of the analyzed concept (here the internal audit quality).

The contribution of these methods (contrary to the regression) is to allow the processing of simultaneous estimates of several dependency relationships and to include the measurement errors in the estimation process (Roussel *et al.*, 2002).

CFA ensures that factors define well our construct "the internal audit quality." It aims here to assess the capacity of the four latent variables, namely, auditor independence, auditor knowledge, standard compliance and relation with the external auditor, to represent the internal audit quality.

This analysis is performed using the AMOS 21 software. Several criteria were used to evaluate the robustness of the measurement model (Bollen and Long, 1993), especially, the ratio of Chi-square/number of degrees of freedom (CMIN/DF) which must be between 1 and 5; the RMSEA (mean squared error approximation) which must be less than 0.05 and the adjustment quality index (GFI), comparison index (CFI), adjustment of the bond index (AGFI) which must be greater than 0.9.

Table 4 shows that the indices implemented GFI (0.977), CFI (0.855) and AGFI (0.919) exceed the recommended threshold values. The ratio of chi-square to CMIN/DF (4.795) is within the recommended range. Estimated by the maximum likelihood (ML) method, the model obtained (Figure 1/Table 6) is very acceptable with regard to the quality of the corresponding adjustment indices. Indeed, the CMIN/DF index indicates that the model fits well with the empirical data. However, to ensure the quality of the fit of the empirical data, this statistic is insufficient. It is most often supplemented by various *ad hoc* fit indices to

indicate how well the overall model explains the data. Absolute measurement indices (RMR, GFI and AGFI) and incremental measurement indices (CFI and NFI) are therefore examined. The results show a good fit of the measurement model with the empirical data (standard norms respected).

Table 5 shows that all the factors extracted from the principal component analysis, namely, the knowledge of the internal auditor, the independence of reporting, compliance with professional standards of internal audit, the relationship with the external auditor, the personal relationship of the internal auditor, the access to information and the field of intervention of the internal auditor, have a positive association with the internal audit quality but with a different degree of significance. Indeed, these factors do not have the same explanatory power of the of the internal audit quality. It can be seen from Table 5 that the intervention field of the internal auditor is the most important factor explaining internal audit quality, followed by access to information.

Table 4.
Fit indices of the internal audit quality model (Appendix 3; Tables from A3.1 to A3.10)

Models	*CMIN/DF*	*RMR*	*GFI*	*AGFI*	*NFI*	*CFI*	*RMSEA*
Standard	≤5	<0.1	>0.9	>0.8	>0.8	>0.8	<0.08
Integral Model	4.795	0.790	0.977	0.919	0.815	0.855	0.287

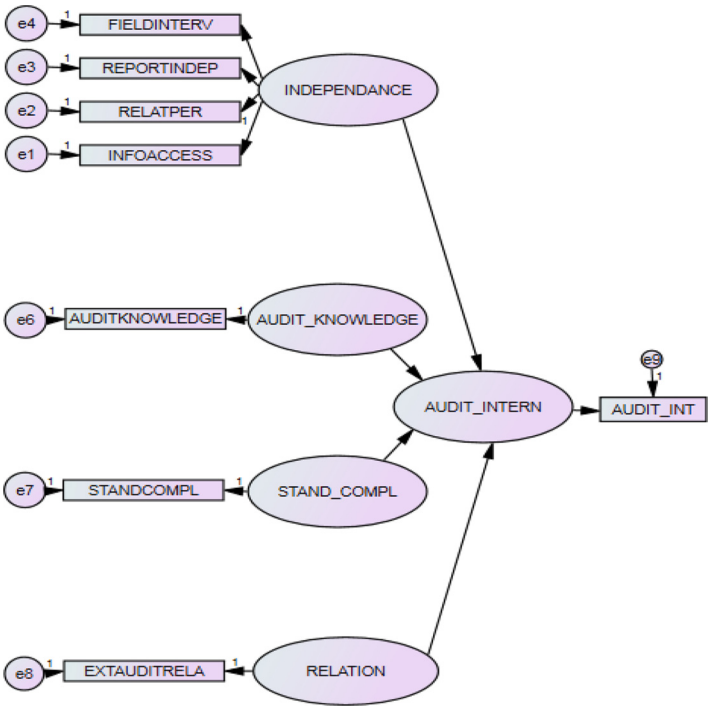

Figure 1.
Measurement Model of the internal audit quality

On the other hand, although we note that the non-significance of the two following factors: the knowledge of the internal auditor and the relationship with the external auditor and, therefore, the lack of explanatory power of these two factors to explain the internal audit quality.

Regarding the factor concerning the internal auditor intervention field, Table 5 shows a positive and significant association between the scope of the internal auditor and the internal audit quality (estimate 1,129; very significant). It should be noted that this dimension is an essential component of internal audit quality. This is consistent with Internal Audit Standard 2220, which highlights the importance of expanding the scope of the internal audit function. So, the internal auditor can achieve the engagement objectives. Standards state that the scope of the engagement must cover the systems, documents, personnel and assets involved, including those under the control of third parties, and must enable internal auditors to meet the agreed objectives.

However, if the enlargement of the scope of the internal auditor is a prerequisite, this condition is not sufficient to support the independence of the internal auditor. Indeed, Table 5 shows that the factor access to information is positively and significantly (estimate: 0.778; very significant) related to the internal audit quality. It should be noted that the explanatory power of this factor is in second place in terms of significance in the explanation of the internal audit quality after the factor entitled the field of intervention of the internal auditor. This can be explained by the fact that the purpose of the internal audit is to evaluate the company's internal control system and to identify any anomalies, deficiencies and failures to improve it. Indeed, limiting the internal auditor's access to the necessary information may lead to threats that may

Table 5.
Causal relationships between the internal audit quality and factors of the PCA (Appendix 3; Table A3.11)

	Estimate	SE	CR	P
Field intervention	1.129	0.025	46.051	***
Reporting independance	0.112	0.025	4,554	***
Personal relationship	0.027	0.025	1,084	0.078
Access to information	0.778	0.025	31.757	***
Audit knowledge	0.034	0,025	1.383	0.067
Standards compliance	0.172	0.025	7,019	***
External audit relationship	0.263	0.025	10,729	***

Table 6.
Internal auditors' profiles groups (Appendix 4; Table A4.2)

	Center of the final classes				ANOVA	
	Group 1 (n = 27)	Group 2 (n = 41)	Group 3 (n = 18)	Group 4 (n = 18)	F	Sig.
Audit knowledge	0.17455	0.33769	0.15004	−1.18105	14.359	0.000
FIELD INTERVENTION	0.78936	−0.36147	−0.22937	−0.13132	9.819	0.000
Reporting independence	0.04026	−0.08903	−0.40583	0.54823	3.092	00.030
Standards compliance	1.06986	0.36494	0.10375	0.66979	25.490	0.000
External audit relationship	0.06512	0.28579	−0.06888	−0.67976	4.340	0.006
Personal relationship	0.35864	0.45646	−1.82934	0.25167	82.628	0.000
Access to information	0.06006	0.35438	−0.09120	−0.80607	6.632	0.000

Note: ANOVA: Analysis Of VAriance

significantly or limit the ability of the internal auditor to conduct a mission without bias or hindrance. Concerning the factor named the personal relationship of the internal auditor, results show a non-significant association between internal auditor personal relationship and the internal audit quality. We can conclude that this dimension does not explain the internal auditor independence and, by the way, the internal audit quality.

The results show the establishment of a positive and significant relationship between the internal auditor reporting independence and the internal audit quality (estimate 0.112; very significant). This is because of the importance of the objectivity of the internal auditor in carrying out his mission and in the drafting of his report. Indeed, he must not undergo any interference when communicating his objective professional judgments. This is also because of the important need for a correct and reliable report that shows the real situation of the company and allows people to make the right decision. Besides, the fact that the internal audit function is still attached to the general management allows the inmternal auditor to carry out his audit without any influence.

Table 5 shows also a non-significant association between internal audit knowledge and internal audit quality. The importance can explain that the internal auditors give to the practice rather than the theoretical knowledge of the auditor. This can be justified by the fact that experience plays an important role in acquiring the technical knowledge necessary to practice internal audit effectively. Otherwise, it allows the listener to learn the rules and deep techniques that the theory does not offer.

Hence, the factor entitled internal audit knowledge does not explain the internal audit quality.

Table 5 shows that factor entitled internal auditor standard compliance is positively and significantly related to the internal audit quality (estimate 0.172; very significant). This leads to conclude that adherence to professional standards is a factor of internal audit quality.

From Table 5, we note also the existence of a positive and significant relationship between the relationship of the internal auditor with the external auditor and the internal audit quality (estimate 0,263; very significant). This tells us that cooperation and coordination between internal auditors and external auditor influences internal audit quality. Indeed, the use of internal audit work by the external auditor motivates the internal auditor to do better and more accurate work. On the other hand, if the external auditor neglects the internal auditor report and performs its audit as if it does not exist, it discourages the internal auditor from improving its work by making it assertive that its work does not matter. Thus, the synergy between the two internal and external audit functions will present new opportunities for internal audit to improve its efficiency and effectiveness.

Also, this is explained by the complementarity of the two functions. Indeed, the spectrum of the intervention of the internal audit is particularly wide because it concerns all the functions, techniques and disciplines of the organization. Hence, the internal auditors consider that the external auditor cannot properly carry out his mission without cooperating with them, which strengthens the internal audit service and improves its quality. In addition, the evaluation of the internal control system represents a point of convergence between the IA and the external auditor. Indeed, even if the apprehension of internal control is different between the two professions, it is nonetheless a major concern for both. It is therefore desirable, according to the internal auditors, for the sake of efficiency and quality, that they coordinate their activities better and rely on their respective skills and resources.

3.4 Hierarchical cluster analysis

The final step of the analysis is to identify groups of internal auditors. This is a typological classification analysis. The typological analysis classifies the individuals in the survey into homogeneous sets whose individuals are different from each other and in which individuals are also similar within these groups to each other (Malhotra *et al.*, 2004). It is then a question of classifying the individuals according to the resemblance of their answers.

The seven factors extracted from the performed PCR will be used to avoid a large number of items and avoid any risk of correlation between the variables (Evrard, 1997). Hence, factor scores will be used to form classes (Punj and Stewart, 1983).

We first performed a hierarchical analysis and then completed the analysis with a non-hierarchical analysis. Indeed, several experts propose to use a procedure in two stages: in the first, one uses a hierarchical algorithm to define the number of classes and the centroids of the classes. In the second step, the results of the previous analysis are used as a starting point for a non-hierarchical classification analysis (Hair *et al.*, 1992; Punj and Stewart, 1983). This way of proceeding makes it possible to increase the validity of the typological solutions (Punj and Stewart, 1983). (Table 6).

We first used Ward's method. After several attempts, a four-class solution was chosen. The results of non-hierarchical classification obtained show that the first class consists of 27 auditors, the second class consists of 41 auditors, and the third and fourth classes are made up of 18 auditors each.

The one-way ANOVA test showed that the factors auditor knowledge, adherence to norms, personal independence and the field of intervention of the internal auditor are the most important factors in this classification (F = 14.359, F = 25.490, F = 82.628 and F = 9.819, respectively). On the other hand, the factors, the independence in the reporting, the relation with the external auditor and the access to the information intervene the least in this classification (respectively F = 3.092, F = 4.340 and F = 6.632).

First-class auditors (N = 27) are very sensitive to the field of practice of the internal auditor and personal independence of the auditor. In return, they are less sensitive to other factors. Although the values are mostly positive but are small compared to the values of the factors which concern the field of intervention and personal independence, these auditors are described as autonomous.

The second-largest class of auditors (N = 41) places a high premium on the majority of internal audit quality factors. They are very sensitive to the competence of the internal auditor (0.33769), adherence to professional standards (0.36494), relationship with the external auditor (0.28579), personal independence of the internal auditor (0.45646) and free access to information (0.35438). On the other hand, they do not give importance to the field of intervention of the internal auditor and the independence of reporting. These auditors are called perfectionists.

Third-class auditors (N = 18) give the least importance to most factors of internal audit quality. On the other hand, they perceive that the internal audit quality is sensitive to the knowledge of the internal auditor (0.15004) and adherence to standards (0.10375). On the other hand, this group does not give any particular importance to other factors (negative scores). Hence, these auditors are qualified as rigorous.

The fourth-class auditors (N = 18) are sensitive to the independence of reporting, adherence to standards and personal independence. On the other hand, they do not attach importance to other factors. These auditors are referred to as objectives.

4. Conclusion

Our research aims to highlight the personal attributes of Tunisian internal auditors through the construction of a scale of determinants of the internal audit quality in Tunisia. Our methodological approach is based on the submission of a self-administered Likert type questionnaire constructed by five scales of points where the lowest scale represents the strong disagreement of the respondent and the largest scale represents the strong agreement of the respondent to Tunisian internal auditors. Our final sample consists of 104 internal auditors.

The first step of the study is in the conduct of a principal component factor analysis (PCA) which highlights seven factors of the internal audit quality, namely, the knowledge of the internal auditor, the field of involvement of the internal auditor, independence of reporting, adherence to professional standards of internal audit, relationship with the external auditor, personal independence of the internal auditor and free access to information. The CFA allowed us to validate the initial model proposed by the ACP. On a theoretical level, this study relates to the highlighting of the multidimensional aspect of the internal audit quality. Indeed, the scale makes it possible to distinguish three dimensions, namely, independence of the internal auditor, standard compliance and relation with the external auditor.

From the typological analysis, four groups of internal auditors emerged: the autonomous, the perfectionists, the rigorous ones and the objectives.

As mentioned below, our study differs from the previous literature, in terms of instruments for measuring the internal audit quality. We, therefore, propose to introduce a new measurement which is the use of the internal audit work by the external auditor. Also, our context of research is extensive in that few studies have attempted to combine the characteristics of the internal audit quality and the profiles of internal auditors according to their perceptions in an emerging context, like Tunisia. Indeed, this study proposes to provide explanations for Tunisian companies who wish to improve the efficiency of their internal audit function. As a result, the quality of the information conveyed through internal audit reports is improved. This translates into a positive development in the performance of the company and its growth opportunities.

The major limitation of this research is its exploratory nature. Its second limitation is that the classification of the auditors has been constructed according to the perception of the auditors; it does not necessarily present the reality. The results obtained should be confirmed by a quantitative survey of another sample.

We also plan to carry out comparative studies of the actual practices of internal auditors with the results obtained in this study. In particular, other criteria, which are not dealt with in this survey, such as the sector, the certification of the external auditor, may be the subject of future research.

Note

1. For example, Enron had no internal audit function because it was outsourced to Arthur Andersen. We can also cite the example of WorldCom, where the internal auditor helped to discover the accounting fraud.

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Appendix 1. Descriptive statistics

Table A1.1. Gender

	Effectives	(%)	Valid (%)	Cumulative (%)
Valid				
Male	80	76.9	76.9	76.9
female	24	23.1	23,1	100.0
Total	104	100.0	100.0	

Table A1.2. Age

	Effective	(%)	Valid (%)	Cumulative (%)
Valid				
Under 35 years	62	59.6	59.6	59.6
Between 35 and 45 years	30	28.8	28.8	88.5
More than 45 years	12	11.5	11.5	100.0
Total	104	100,0	100.0	

Table A1.3. Experience

	Effective	(%)	Valid (%)	Cumulative (%)
Valid				
Less than 3 years	30	28.8	28.8	28.8
Between 3 and 10 years	46	44.2	44.2	73.1
More than 10 years	28	26.9	26.9	100.0
Total	104	100.0	100.0	

Table A1.4. Sector

	Effective	(%)	Valid (%)	Cumulative (%)
Valid				
Private	70	67.3	67.3	67.3
Public	34	32.7	32.7	100.0
Total	104	100.0	100.0	

Table A1.5. Formation

	Effectives	(%)	Valid (%)	Cumulative (%)
Valid				
Management Sc.	86	82.7	82.7	82.7
Others	18	17.3	17.3	100.0
Total	104	100.0	100.0	

Appendix 2. Components principal analysis

Table A2.1. Extraction quality and variance out-put Communalities

	Initial	Extraction
The organization allows internal auditors to participate in training programs to maintain their skills and keep up to date in the field	1.000	0.954
The internal auditors have the appropriate and relevant training which enables them to audit all of the organization's systems	1.000	0.934
The auditor must intervene in all organizational units and all questions	1.000	0.895
There is regular monitoring by internal audit staff to examine the measures taken to correct the problems encountered	1.000	0.893
The internal auditor has regular and direct working relationships with the managing director and the management team	1.000	0.909
The internal audit staff has free access to the organization's information and data which can be downloaded and examined by them	1.000	0.843
−the internal audit works in a completely independent way and allows the auditor to access all necessary information	1.000	0.881
−the completion of the internal audit work requires the approval of the audit committee and/or the board of directors	1.000	0.876
−the internal auditor can execute the audit activities without any interference from anyone and without any influence	1.000	0.944
the internal auditor is free to include any finding of the audit in his audit work and report it directly to the responsible person	1.000	0.974
the internal auditor must necessarily have a certification in the audit	1,000	0.928
internal audit must be carried out using modern technology which uses computer data tools and specific software for internal audit	1.000	0.858
The internal audit charter must be maintained in the "Internal Audit" department	1,000	0.974
The more quality the internal auditor's work is considered the more the external auditor takes it into consideration	1.000	0.781
For a quality external audit, the external auditor must cooperate with the internal audit department of the organization	1,000	0.955
Periodic meetings between the external auditor and the internal auditor improves the quality of the internal audit	1.000	,960
the internal auditor must have at least 3 years of experience	1.000	,923
Standards compliance	1.000	,981

Note: Extraction Method: Principal Component Analysis

Component	Initial Eigenvalues Total	(%) of Variance	Cumulative (%)	Extraction Sums of Squared Loadings Total	(%) of Variance	Cumulative (%)	Rotation Sums of Squared Loadings Total	(%) of Variance	Cumulative (%)
1	4.496	24.978	24.978	4.496	24.978	24.978	4.019	22,325	22.325
2	3.425	19.028	44.006	3,.425	19.028	44.006	2.750	15.278	37.603
3	2.438	13,545	57.551	2.438	13.545	57.551	2.125	11.806	49.409
4	2,173	12.071	69.621	2.173	12.071	69,621	2.044	11.353	60,762
5	1.766	9.813	79.435	1.766	9.813	79.435	1.988	11.046	71.808
6	1.260	6.997	86.432	1.260	6.997	86.432	1.861	10.339	82.147
7	0.907	5.037	91,469	0.907	5.037	91.469	1.678	9.322	91.469
8	0.645	3.581	95,050						
9	0.213	1.184	96.234						
10	0.182	1.010	97.244						
11	0.153	0.52	98.096						
12	0.094	0.521	98.617						
13	0.074	0.410	99.027						
14	0.056	0.311	99.339						
15	0.047	0.261	99.600						
16	0.038	0.209	99.808						
17	0.023	0.129	99,937						
18	0.011	0.063	100.000						

Note: Extraction Method: Principal Component Analysis

Table A2.2.
Total variance explained

KMO and Bartlett's Test	
Kaiser–Meyer–Olkin measure of sampling Adequacy	0.643
Bartlett's test of sphericity	
Approx. $\chi 2$	2202.269
df	153
Sig.	0.000

Note: After rotation factoring matrix

Table A2.3.
KMO and Bartlett's test

Appendix 3. Confirmatory factorial analysis

Model Fit Summary

Model	NPAR	CMIN	DF	*P*	CMIN/DF
Default model	57	225.267	114	0.000	1.976
Saturated model	171	0.000	0		
Independence model	18	2358.756	153	0.000	15.417

Table A3.1. CMIN

Note: NPAR: Non-parametric Statistics

Model	RMR	GFI	AGFI	PGFI
Default model	0.076	0.833	0.749	0.555
Saturated model	0.000	1,000		
Independence model	0.315	0.370	0.296	0.331

Table A3.2. RMR, GFI

Note: RMR: Root Mean Square Residual; GFI: Goodness-Of-Fit Index

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	0.904	0.872	0.950	0.932	0.950
Saturated model	1,000		1,000		1,000
Independence model	0.000	0.000	0.000	0.000	0.000

TABLE A3.3. Baseline comparisons

Note: NFI: The Normed Fit Index; RFI: Relative Fit Index; IFI: Incremental Fit Index; TLI: Tucker Lewis index

Model	PRATIO	PNFI	PCFI
Default model	0.745	0.674	0.708
Saturated model	0.000	0.000	0.000
Independence model	1,000	0.000	0.000

TABLE A3.4. Parsimony-adjusted measures

Note: PRATIO: The Parsimony Ratio; PNFI: Parsimonious Normed Fit Index; PCFI: The Parsimonious Comparative Fit Index

Model	NCP	LO 90	HI 90
Default model	111.267	72.437	157.887
Saturated model	0.000	0.000	0.000
Independence model	2205.756	2052.226	2366.651

Table A3.5. NCP

Note: LO 90 Amos reports a 90% confidence interval for the population value of several statistics. The upper and lower boundaries are given in columns labeled HI 90 and LO 90; HI 90: Amos reports a 90% confidence interval for the population value of several statistics. The upper and lower boundaries are given in columns labeled HI 90 and LO 90.

Model	FMIN	F0	LO 90	HI 90
Default model	2.187	1.080	0.703	1,533
Saturated model	0.000	0.000	0.000	0.000
Independence model	22.901	21.415	19.925	22.977

Note: FMIN is the minimum value,F , of the discrepancy, F; F0: display the value of in the output path diagram,: F0 LO to display its lower 90% confidence estimate, and \F0 HI to display the upper 90% confidence estimate.

Table A3.6. FMIN

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.097	0.079	0.116	0.000
Independence model	0.374	0.361	0.388	0.000

Table A3.7. RMSEA

Model	AIC	BCC	BIC	CAIC
Default model	339.267	365.053	489.997	546.997
Saturated model	342,000	419,357	794,191	965.191
Independence model	2394.756	2402.898	2442.355	2460.355

Note: BCC, Browne-Cudeck Criterion; BAIC, The Bayes Information Criterion; CAIC: Consistent Akaike's Information Criterion

Table A3.8. AIC

Model	ECVI	LO 90	HI 90	MECVI
Default model	3.294	2.917	3.746	3.544
Saturated model	3.320	3.320	3.320	4.071
Independence model	23.250	21.759	24.812	23.329

Note: MECVI, Modified Expected Cross Validation Index

Table A3.9. ECVI: Expected Cross-Validation Index

Model	HOELTER 0.05	HOELTER 0.01
Default model	64	70
Independence model	8	9

Table A3.10. HOELTER

Estimate	SE	CR	*P*	Label
AUDIT_INT ← FIELD_INTERV	1.129	0.025	46.051	***
AUDIT_INT ← REPORT_INDEP	0.112	0.025	4.554	***
AUDIT_INT ← RELAT-PER	0.027	0.025	1.084	0.078
AUDIT_INT ← INFO_ACCESS	0.778	0.025	31.757	***
AUDIT_INT ← AUDIT_KNOWLEDGE	0.034	0.025	1.383	0.067
AUDIT_INT ← STAND_COMPL	0.172	0.025	7.019	***
AUDIT_INT ← EXTAUDIT_RELA	0.263	0.025	10.729	***

Table A3.11. Causal relationships between the internal audit quality and factors of the PCA

Appendix 4. Clustering analysis

Final cluster centers

Number of individuals in each group.

Table A4.1. Final cluster centers

	Cluster			
	1	2	3	4
REGR factor score 1 for analysis 1	0.17455	0.33769	0.15004	−1.18105
REGR factor score 2 for analysis 1	0.78936	−0.36147	−0.22937	−0.13132
REGR factor score 3 for analysis 1	0.04026	−0.08903	−0.40583	0.54823
REGR factor score 4 for analysis 1	−1.06986	0.36494	0.10375	0.66979
REGR factor score 5 for analysis 1	0.06512	0.28579	−0.06888	−0.67976
REGR factor score 6 for analysis 1	0.35864	0.45646	−1.82934	0.25167
REGR factor score 7 for analysis 1	0.06006	0.35438	−0.09120	−0.80607

Table A4.2. One-way ANOVA test

	ANOVA					
	Cluster		Error			
	Mean square	df	Mean square	df	*F*	Sig.
REGR factor score 1 for analysis 1	10.337	3	0.20	100	14.359	0.000
REGR factor score 2 for analysis 1	7.813	3	0.796	100	9.819	0.000
REGR factor score 3 for analysis 1	2.914	3	0.943	100	3.092	0.030
REGR factor score 4 for analysis 1	14.878	3	0.584	100	25.490	0.000
REGR factor score 5 for analysis 1	3.955	3	0.911	100	4.340	0.006
REGR factor score 6 for analysis 1	24.464	3	0.296	100	82.628	0.000
REGR factor score 7 for analysis 1	5.697	3	0.859	100	6.632	0.000

Note: The *F*-tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal

Table A4.3. Number of cases in each cluster

Cluster	
1	27,000
2	41,000
3	18,000
4	18,000
Valid	104,000
Missing	0.000

	Component						
	1	2	3	4	5	6	7
The organization allows internal auditors to participate in training programs to maintain their skills and keep up to date in the field	0.959						
The internal auditors have the appropriate and relevant training which enables them to audit all of the organization's systems		0.956					
The auditor must intervene in all organizational units and all questions		0.939					
There is regular monitoring by internal audit staff to examine the measures taken to correct the problems encountered		0.895					
The internal auditor has regular and direct working relationships with the managing director and the management team						0.938	
The internal audit staff has free access to the organization's information and data which can be downloaded and examined by them							0.674
−the internal audit works in a completely independent way and allows the auditor to access all necessary information							0.697
−the completion of the internal audit work requires the approval of the audit committee and/or the board of directors						0.926	
−the internal auditor can execute the audit activities without any interference from anyone and without any influence			0.926				
the internal auditor is free to include any finding of the audit in his audit work and report it directly to the responsible person			0.966				
the internal auditor must necessarily have a certification in the audit	0.950						
internal audit must be carried out using modern technology which uses computer data tools and specific software for internal audit	0.911						
The internal audit charter must be maintained in the "Internal Audit" department				0.967			
The more quality the internal auditor's work is considered the more the external auditor takes it into consideration							0.821
For a quality external audit, the external auditor must cooperate with the internal audit department of the organization					0.953		
Periodic meetings between the external auditor and the internal auditor improves the quality of the internal audit					0.946		
the internal auditor must have at least three years of experience	0.934						
Standards compliance				0.962			

Note: Extraction Method: Principal component analysis. Rotation Method: Varimax with Kaiser normalization

Table A4.4.
Rotated component matrix[a]

Appendix 5. Reliability test: Cronbach's α

Table A5.1. Component 1 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.970	4

Table A5.2. Component 2 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.942	3

Table A5.3. Component 3 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.979	2

Table A5.4. Component 4 Reliability Test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.990	2

Table A5.5. Component 5 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.965	2

Table A5.6. Component 6 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.885	2

Table A5.7. Component 7 reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.739	3

Table A5.8. Total scale reliability test (Cronbach's α)

Reliability statistics	
Cronbach's α	*N* of items
0.768	18

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