

# Designing a model to analyze the effects performance audit of effectiveness to improve accountability of executive agencies

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## Abstract

In our country, management of a large part of the economic resources is the responsibility of the state, and therefore its management has fundamental effects on the nation's fate. Therefore, public sector managers must be accountable to the people and their representatives, and provide the means for this accountability based on valid information. Nevertheless, to achieve adequate and appropriate accountability, the public sector naturally requires performance auditing in various components in addition to investigating financial statements and making statements in the framework of financial auditing principles. Therefore, the present study aims to propose a model to analyze the effects of performance audits on effectiveness to improve the accountability of executive agencies. For this purpose, the research method was correlational and in the form of a survey design with practical objectives. Then, to test the hypothesis (7) and obtain the optimal model, using Pearson correlation, regression, and meaningfulness of structural equations and finally, the path analysis algorithm through SPSS software, was designed and tested. The statistical population included directors, auditors, and experts of the Supreme Audit Court of Iran (SAC) from March 2016 to March 2018. The results of the test of research hypotheses showed that the effectiveness of performance audits through direct and indirect paths affects the improvement of accountability of executive agencies and its seven dimensions. Directly according to the results of the research, the research hypotheses (7) for the indirect effect of the effectiveness performance auditing on organizational, legal, professional, political, financial, moral and cultural accountability rates of 0.077, 0.025, 0.078, 0.093, 0.088, 0.085, and 0.055. The harmonious mean of the composite indexes of meaning as indirect effects of this pattern is estimated at 0.501. Exploratory results, combined with the confirmation of research hypotheses and design of equations and structural regressions, provide an optimal model that accounts for about 50.1% of the changes in executive accountability responses through the implementation of the audit of effectiveness, indicating that the audit performance of the effectiveness has a significant relation with the improvement Responsible for executing agencies.

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## 1 Introduction

With the globalization of the economy and the evolutionary processes of various industries, higher efficiency has become one of the major concerns of managers. Since managers need data beyond historical financial data to help their organizations survive, assessment of the status quo by controlling the mechanisms through which organizational objectives are achieved, innovation-based adaptation to the environment, identification of improvement opportunities, and elimination of weaknesses to use progress opportunities based on effectiveness, efficiency, and economic are prerequisites for organizational survival. Financial supervision over the public sector is necessary and indisputable but seems to be inadequate. In some cases, it has been observed that the budget is spent by rules and regulations; however, the results are inconsistent with what was predicted in programs or the result is nothing but a waste of resources. The developments that have taken place in management science and finance in recent years along with increased expectations of people's representatives and other users about the results of audits have revealed inefficiencies of financial audits for some specific purposes and necessitated the need for performance auditing to meet the needs of audit reports users [6]. Moreover, the limitation of resources and facilities, on one hand, and objectives of mid-term and long-term socioeffectiveness programs to achieve growth and development, on the other hand, make it inevitable to ensure the orientation of the programs and activities of the Iranian public sector, regarded as the largest and most influential effectiveness sector, towards achieving the preset goals in an effective, economically and efficient manner. Accordingly, it is essential to establish a system of performance auditing in this sector [10]. Thus, auditors can play a major role in governmental decisions and the improvement of such systems and accountability levels. Now that Iran's economic, social, and cultural development plans are on a new path and a new transformation outlook has emerged, managers must pay special attention to performance auditing, increase the effectiveness and economy of their subordinate organizations and further promote new auditing practices such as performance auditing to take part in the economic, social, and cultural prosperity of Iran. As a result, they can improve their ability to compete with external rivals in the global arena along with the caravan of construction and economy inside the country [5].

Hence, the present study aims to design a model to analyze the effects of performance audits on effectiveness to improve the accountability of executive agencies. Since few comprehensive studies have been conducted on this subject in Iran and other countries, there is a tangible innovation in the subject, title, and statistical practices. The present study is important in several respects such as: A. lack of attention to the functional and practical aspects of performance auditing and accountability in previous studies and mere focus on theoretical issues, B. failure to meet the informational needs of regulatory authorities such as SAC and the community and lack of transparency and fair accountability through financial auditing, C. ever-increasing advances and transformations of today's highly vibrant world and taking into account the challenges of decision-makers in executive agencies regarding the use of limited resources to achieve expected results, D. effective and efficient use of performance auditing tools to meet the needs of users of financial and non-financial reporting information in terms of effectiveness and economic, E. development of the theoretical and operational support underlying further implementation of performance auditing in order to enhance the effectiveness of executive agencies, and F. increasing public awareness and knowledge on performance auditing and accountability and its dimensions.

Therefore, the main research questions are as follows: a) is there any significant relationship between performance audit of effectiveness and accountability of executive agencies and b) how would the path analysis model be for the relationship of performance audit of effectiveness and improvement of executive agencies accountability? To answer these questions, 7 hypotheses were developed and tested using a research library and documentary method. This is a qualitative applied study based on analytical and causal methods.

## 2 Theoretical framework and research background

### 2.1 Performance auditing

The performance audit eventually led to a wider international movement called "New Public Management." In the 1970s, the adoption of this philosophy of the public sector accelerated. The move to modern management, similar to performance auditing, was the result of public sector concerns, and demand for performance audits increased further. Consequently, this philosophy implies the development of responsibilities and thus the accountability of public sector managers. Performance auditing is a measure of productivity and performance managers of government executives because most of the activities of these devices are in line with the issues of monitoring, control and issues related to public interest [12].

Performance auditing was first introduced in Germany, England, Canada, and the US in 1875 and was then raised seriously in England in 1930. The publication of auditing standards for governmental agencies by the US

Government Accountability Office (GAO) in 1972, which were later compiled in a book known as the Yellow Book, can be considered the official starting point of the concept of performance auditing as a new field of public audit. The importance of the new type of audit was seriously and officially taken into account at the Lima Conference in 1977. Public institutions, especially GAO, have also been effective in developing performance auditing practices. Like the American Institute of Certified Public Accountants (AICPA), GAO standards emphasize the importance of economic, efficiency, and effectiveness. This type of auditing in Iran dates back to 2009 when SAC developed a guideline for performance auditing. The focus and scope of many audits in the public and private sectors have changed in recent years. Since the financial statements alone do not meet the managerial information requirements, managers of public and private sectors are seeking more information to assess and judge the quality of operations and operational progress. Performance auditing is a kind of auditing that consults managers and presents the results as correctional suggestions. In addition, performance auditing is the systematic process of investigating the economic, efficiency, and effectiveness of operations controlled by the manager and reporting the results along with recommendations to qualified individuals and stakeholders to improve operations [5].

## 2.2 Performance auditing of effectiveness

The accountability of the public and private sectors can be enhanced by improving the triple components of economics, efficiency, and effectiveness. Nowadays, the evaluation of these components is a part of the management process in every enterprise. The term “effectiveness” often implies a variety of different and ambiguous meanings. This term is usually used in political debates and mass media in the area of cost reduction, especially discussions on liquidity limitations. There are similar definitions of effectiveness and efficiency in the proceedings of management and operational auditing, whereas there is no consensus on the definition of effectiveness. According to the Performance Committee of SAC, effectiveness is defined as the efforts made to minimize the cost of acquisition and use of resources while maintaining their good quality [2]. Based on this definition, measurement and evaluation of effectiveness are of great importance in the process of effectiveness auditing and have always been considered by performance auditors. Effectiveness deals with the acquisition of a variety of physical, financial, human, and informational resources. The objective of performance auditors is to determine whether these resources are acquired in the right quantity, from the right place and time, from the right type, and at the right price. When it comes to effectiveness and its relationship with quantity, location, time, quality, and cost, the most comprehensive and complete criteria are needed to evaluate whether effectiveness is observed in the acquisition of resources [5].

## 2.3 Accountability

Accountability is the basis of every society claiming to be democratic. Accountability is not only a sign of a democratic political regime but also an essential element for improving the performance of government officials. It is also the basis of modern management. Therefore, public accountability is a complement to public management in democratic governments [4]. The accountability rate has long been affected by the public pressure on authorities to respond. Globalization and the influence of global financial status on the economy of countries have added international communities to the list of questioners. Professor Uji Ejeri, in his famous speech at Harvard University, stated that the theoretical framework of reporting can be developed based on either decision - making accountability, each of which may produce different results. Ejeri believes that objective reporting is in the decision - making. based framework is to establish an appropriate information flow system between the responder and the questioner. Preferring the accounting system fairness over information usefulness, this framework is based on two-way communication. Accordingly, not only the questioner is entitled to know but also the responder considers privacy for themselves in information disclosure. In this framework, financial reporting supports both the questioner and the responder by ensuring the timely and accurate flow of information and setting limitations to full disclosure of information, respectively. According to Conceptual Statement No. 7 of the US Governmental Accounting Standards Board (GASB), Accountability is the cornerstone of all governmental financial reports and obliges the government to respond to citizens about their measures and actions. This statement indicates that citizens have the right to know and are entitled to access to realities publicly and securely [1].

## 3 Research background

A study by Weihrich [14] aims to provide knowledge concerning performance auditing by examining the implementation in Germany. The text shows how the principles of performance auditing are implemented in Germany. The German approach is special because the international standards are not implemented in Germany, and there

are neither any existing scientific studies nor any other literature concerning performance audits in Germany. The research method was field type and through correlation analysis regression and structural equations. To analyze the implementation of performance auditing in practice, a sample of existing audits from public audit institutions in Germany was scrutinized. The sample consists of audits related to environmental issues described in the yearly reports of public audit institutions (from 2006 to the present). It has been evaluated whether the findings or recommendations described in the yearly reports contain considerations according to the principles of efficiency and effectiveness. The sample (Appendix) shows clearly that the provisions of the German Federal Budget Code had been fully considered. The scope respectively the findings of public audits in Germany refers not only to accountability or compliance but also to efficiency and effectiveness. In nearly every audit implications of economy, efficiency and effectiveness had been highlighted. Especially in terms of scrutinized subsidy directives, public audit institutions emphasized the examination of efficiency and effectiveness. The study comprises a general discussion of the goals and boundaries of performance auditing with an environmental perspective based on a literature study. The text also describes the theoretical, legal and methodological background of performance audits in Germany. Findings concerning the status quo of performance auditing in Germany are based on an analysis of audits conducted by public audit institutions. The findings were compared with findings from other current international studies. The sample of scrutinized audits conducted by the public audit institutions shows clearly that the provisions of the German Federal Budget Code had been fully implemented. In nearly every study, implications of economy, efficiency and effectiveness have been considered. Hence, even without any references to international standards, the core principles of performance audit are considered in the audits conducted by the public audit institutions in Germany. The main focus in the audits had been placed on efficiency and effectiveness. It is also very remarkable how far-reaching the findings of the audits in Germany are. Especially, in terms of scrutinized subsidy directives, the public audit institutions are not reducing their recommendations to the implementation of the granting process but to the directives themselves.

Mahmoud Khani and Ahmadi [9] in Iran By field research and in the form of descriptive research to review carried out a study on performance auditing with an emphasis on the public sector. They stated that the community's questioning, on the one hand, and the government's accountability for the use of public resources, on the other hand, became very important in today's Iranian society. Therefore, the performance auditing plays a valuable role in this regard. Considering the close relationship between performance auditing and operational budgeting in this area and the reasons for its incomplete implementation, it was concluded that the main challenge of performance auditing is the lack of proper understanding and cognition of this type of audit in the public sector.

Nekhai et al. [11] analyzed the effects of performance auditing on justice and social responsibilities of executive agencies in the public sector and concluded that this type of audit, which involves effectiveness, efficiency, and economic audit, provides the authority responsible for monitoring or corrective actions with information on the improvement of accountability, continuous improvement of performance, cost reduction, and decision-making facilitation. Nowadays, performance auditing can be used to assess the status quo, strategic plans, and organizational performance and improve their effectiveness and efficiency. The research method was field type and the statistical population of the study was all accountants and accountants of organizations based in South Khorasan province of Iran. Based on Cochran's formula, 340 people were selected by random sampling method and data were collected using a questionnaire. SPSS software was used to analyze the data.

Reichborn-Kjennerud and Vabo [13] in the case of the Office of the Auditor General in Norway, University of Oslo, state that performance auditing is one of the factors changing and improving public management. New government administration in many Western countries has increased the use of performance auditing and its other mechanisms. These mechanisms help governments to be accountable and improve. The research method was field type and through correlation analysis regression and structural equations. The findings are primarily based on survey data from 353 Norwegian civil servants. The findings show that the contribution of performance auditing to improvement is less important than it appears at first glance and individual and political factors may affect employees' responses.

In another study entitled Explanation of the components of performance auditing in the public sector of Iran with an emphasis on environmental and social performance, Kamyabi et al. [8] concluded that physical and financial inputs, allocated time and scheduling, productivity rate, The cost, operational proportions, quantity of outputs, timely access to outputs and the extent to which missions and goals are achieved, profitability, the superiority of benefits overspending, and stakeholders satisfaction are among the key factors that should be taken into account in performance auditing. Moreover, performance auditing requires the use of comprehensive quality management techniques, such as a balanced scorecard. Among the available research approaches, an interpretive approach was chosen to allow Delphi to achieve the research objectives. Accordingly, the following steps have been taken in this research. In this study, key factors of the performance auditing criteria from the theoretical foundations, such as the INTOSAI (International Organization of Supreme Audit Institutions), ASUSAI (Asian Organization of Supreme Audit

Institutions) and EUORUSAI (European Organization of Supreme Audit Institutions) performance audit guidelines, and the Iranian Audit Court Performance Guidelines. The books and articles of performance audit were extracted and key questions were included in the questionnaire.

## 4 Hypotheses, path analyze, and research conceptual model

### 4.1 Hypotheses and path equations

Considering the theoretical background presented by domestic and foreign scholars and researchers on the subject of this research in different areas, it is assumed that auditors' findings are regarded as guiding help and, in other words, specialized management consultation, for managers of executive agencies to continuously improve affairs and increase productivity in various organizational pillars. Hence, executive agencies will respond appropriately to this type of auditing. The research hypotheses were as follows:

Hypothesis 1: There is a significant relationship between performance audit of effectiveness and organizational accountability of executive agencies.

Hypothesis 2: There is a significant relationship between performance audit effectiveness and legal accountability of executive agencies.

Hypothesis 3: There is a significant relationship between performance audit of effectiveness and professional accountability of executive agencies.

Hypothesis 4: There is a significant relationship between performance audit effectiveness and political accountability of executive agencies.

Hypothesis 5: There is a significant relationship between performance audit effectiveness and the financial accountability of executive agencies.

Hypothesis 6: There is a significant relationship between performance audit of effectiveness and moral accountability of executive agencies.

Hypothesis 7: There is a significant relationship between performance audit effectiveness and cultural accountability of executive agencies.

### 4.2 Research conceptual model

The following conceptual research model was developed in this study:



Figure 1: The conceptual research model

## 5 Methodology

This a correlational inductive-deductive study. Regarding inference, it was a descriptive-analytical survey. The present study was conducted on the data collected from March 2016 to March 2018. The statistical population included

managers, auditors, and experts of Iran's SAC in 32 provinces (N=2000), 357 of whom were selected as the sample based on Cochran's sample size formula and random sampling method.

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq} \left\{ \begin{array}{l} \text{Sample size} = n, \\ \text{Attribute} = p, \\ \text{Tolerable error} = d = 5\%, \end{array} \right. \quad \left\{ \begin{array}{l} \text{Statistical population} = N \\ \text{Missing attribute statistics} = q \\ \text{confidence level of 95\%} = t = 1(0.95) \end{array} \right.$$

In gathering information for theoretical studies and literature of library and through articles, books, magazines and websites are valid and to this end, relevant papers, books, and reputable journals and websites were reviewed. To measure the components and indices of performance audit of effectiveness and accountability, two researcher made questionnaires were developed on a 5. point Likert scale and distributed among the respondents after their reliability and validity were confirmed. Questionnaire (A) consisted of (16) items and aimed to measure performance audit of effectiveness. Questionnaire (B), with 64 items, was employed to measure the 7 dimensions of accountability including organizational accountability (21 items), legal responsibility (7 items), professional accountability (7 items), political accountability (9 items), financial accountability (6 items), moral accountability (7 items), and cultural accountability (5 items):

Table 1: Specialized Questions (Objective: To measure performance audit of effectiveness) [5]

Question number	Performance audit components
1	Does the performance audit exercise focus on tasks and responsibilities, as well as operations and activities on the critical and successful goals of the public sector?
2	Does performance audit lead to the deployment of new technology and technology in the public sector?
3	Does performance audit lead to the maximum results and outcomes from doing business in the public sector?
4	Does performance auditing lead to the implementation of a performance management system and result-based payment in government departments?
5	Does performance auditing lead to the establishment of a system of suggestive suggestions in the public sector?
6	Does performance auditing lead to the establishment of an entrepreneur suggestion system in government departments?
7	Does performance auditing lead to the implementation and establishment of a successful management system based on planning in government departments?
8	Does performance audit lead to employee turnover (utilization of the expertise as well as employee talent) of government departments?
9	Does performance auditing lead to motivation and work morale among public sector employees?
10	Does performance audit lead to the use of experienced workforce in government sector work?
11	Does performance auditing lead to the creation of appropriate grounding and creativity for managers and staff in government departments?
12	Does performance auditing lead to elimination of discrimination among employees (due to management weakness) in government departments?
13	Does performance audit performance eliminate the inconsistency of individual talent as well as the speciality of the staff with their jobs in the public sector?
14	Does performance auditing lead to the production of thinking in the staff (institutionalization of productivity in thought) of the public sector?
15	Does performance audit performance increase the innovation in the duties and responsibilities of public sector employees?
16	Does performance auditing lead to the improvement of the staffing of government departments based on merit?

The collected data were statistically analyzed in SPSS. First, the data were analyzed using descriptive and inferential statistics. To test the research hypotheses, descriptive statistics (frequency distribution tables and central tendency measures). Then the reliability was measured using Cronbach's alpha. Finally, the Kolmogorov-Smirnov test, the Pearson correlation test, regression test, and path analysis tests were utilized to fulfil the conditions and assumptions of model development and presentation.

## 6 Findings

### 6.1 Analyze of data collection tools (reliability of questionnaires)

To assess the reliability of questionnaires (the ability of questionnaires to measure what was expected to be measured) used in this study, questionnaires were tested on 40 respondents in a pilot study. Cronbach's alpha coefficient was determined for each dimension of accountability in SPSS.18. The overall Cronbach's alpha coefficient was obtained 0.93 for Questionnaire 1 and 0.94 for Questionnaire 2. The closer Cronbach's alpha coefficient to 1, the

Table 2: Accountability questionnaire (Objective: To measure organizational, legal, professional, political, financial, Moral and cultural accountability) [3]

Responsiveness dimensions	di-	Question number	Accountability Components (The Effect of Each of the Factors on Responsiveness)	
Organizational (Operational or Functional and Informative)		1	The amount of referrals for receiving services (Optimal Referral) affects the responsiveness of the operating system?	
		2	Does the availability of managers and office staff affect the responsiveness of the operating system?	
		3	Prevent spreading of letters and excessive formalities affect the responsiveness of executive agencies?	
		4	Does formalism affect the responsiveness of executive agencies?	
		5	Complexity affects the responsiveness of executive agencies?	
		6	Concentration and decentralization affect the responsiveness of executive agencies?	
		7	Politics and strategies affect the responsiveness of executive agencies?	
		8	Transparency in the structure of monitoring the responsiveness of executive agencies?	
		9	Is acceptance in the structure of monitoring the responsiveness of executive agencies?	
		10	Identifying and defining standards with the participation of professors and experts influence the responsiveness of executive agencies?	
		11	Information about policy and implementation plans affect the responsiveness of executive agencies?	
		12	Information on changes to the laws and regulations affect the accountability of executive agencies?	
		13	Confidence in information provided on the responsiveness of operating systems?	
		14	Attracting satisfaction, trust and public support by providing accurate, reliable and timely information on the responsiveness of executive agencies?	
		15	What are the research needs of the staff and the client referring to the responsiveness of executive agencies?	
		16	Confirmation of personnel performance by the client affects the responsiveness of executive agencies?	
	Organizational (Operational or Functional and Informative)		17	Is the component of authority and responsibility affecting the responsiveness of executive agencies?
			18	Is emphasis on performance evaluation and reporting in monitoring the responsiveness of executive agencies?
		19	The professional guidance of students, faculty and staff is affecting the responsiveness of executive agencies?	
		20	Getting professional qualifications (scientific, research and specialized) affect the responsiveness of executive agencies?	
		21	How does the management of human resources, finance and information affect the responsiveness of executive agencies?	
		22	Does the correct implementation of the laws and regulations affect the responsiveness of the operating system?	
Legal		23	Timely and timely information new laws affect the responsiveness of executive agencies?	
		24	Eliminating the vacuum and legal problems affecting citizens' issues affect the responsiveness of executive agencies?	
		25	Provision of annual budget to citizens affects the responsiveness of executive agencies?	
		26	Sophisticated laws and procedural rules affect the responsiveness of executive agencies?	
		27	Control and supervision by the law enforcement agencies and the government affect the accountability of executive agencies?	
		28	Problems changing the rules and regulations, etc., affect the responsiveness of the operating system?	
professional		29	Citizens' Guide to Addressing Administrative Problems Affecting the Responsibility of Executive Agencies?	
		30	The provision of defined services is relevant to the responsiveness of the operating system?	
		31	Does the number of employees have an impact on the responsiveness of the operating system?	
		32	Providing information on performance levels, implementing policies and management plans affecting citizens' responsiveness to executive agencies?	
		33	Does fair service affect the responsiveness of executive agencies?	
		34	Succeeding in facilitating and reducing the time of administrative operations affect the responsiveness of executive agencies?	
		35	Trust in the fulfillment of the promises made by the directors of the administration affect the accountability of executive agencies?	
Political		36	Citizens' participation in decision making by the Office affects the responsiveness of executive agencies?	
		37	Citizen Participation in Choosing Managers Affects Responsibility of Executive Agencies?	
		38	Reduce bureaucracy and administrative discrimination affect the responsiveness of executive agencies?	
		39	Does the consistency between executive implementation plans and societal expectations affect the responsiveness of executive agencies?	

	40	The role of government (entrepreneurial or supremacy) affects the responsiveness of executive agencies?
	41	Does media freedom affect the responsiveness of executive agencies?
	42	Influential groups affect the responsiveness of executive agencies?
	43	Is the balance between organizational independence affect the responsiveness of executive agencies?
	44	Reducing government oversight and control over the responsiveness of executive agencies?
Financial	45	Does real price payment affect the responsiveness of operating systems?
	46	Does fairness affect the responsiveness of executive agencies?
	47	Guiding the expectations of stakeholders to enter values and exit costs affect the responsiveness of executive agencies?
	48	Does budget control affect the responsiveness of executive agencies?
	49	Does financial and regulatory compliance affect the responsiveness of executive agencies?
	50	Does financial reporting affect the responsiveness of executive agencies?
Moral	51	Attention and commitment to the ethical, human and Islamic values of the work affects the responsiveness of executive agencies?
	52	Does the promise affect the responsiveness of the operating system?
	53	Bribes (under the table) and party games affect the responsiveness of executive agencies?
	54	Welcome to the responsiveness of executive agencies?
	55	Observing the rules and regulations of the client refer to the responsiveness of executive agencies?
	56	Honest behavior with client and citizen affects the responsiveness of executive agencies?
	57	Honoring human dignity and enhancing the morale of service affects the responsiveness of executive agencies?
Cultural	58	Socialization, expectations, participation in affairs affect the responsiveness of executive agencies?
	59	The values of justice, fairness, productivity, and effectiveness affect the responsiveness of executive agencies?
	60	The prediction of a strong system of handling complaints affects the responsiveness of executive agencies??
	61	Understanding employee needs affects the responsiveness of executive agencies?
	62	Responsiveness in society about performance on the responsiveness of executive agencies?

more reliable the questionnaire, indicating a strong inner consistency between components of a performance audit of effectiveness and accountability of executive agencies.

Table 3: inner consistency and reliability of the questionnaires

Questionnaire name	Subscales	Number of items	Cronbach's alpha coefficient
Performance audit of effectiveness		7	0.93
	Organizational	21	0.94
Accountability	Legal	7	0.95
	Professional	7	0.93
	Political	9	0.93
	Financial	6	0.96
	Moral	7	0.93
	Cultural	5	0.94
	Total	62	0.94

The above table shows that items of the two questionnaires had a strong inner consistency and reliability.

## 6.2 Descriptive statistics

In this section, demographic characteristics of respondents were described using frequency distribution. The final objective of these tables is to quantify the research data and provide a detailed image of them as much as possible.

Table 4: demographic characteristics of respondents

	Gender	Age	Marital status	Literacy	Position	Work experience	Employment status
Central indices	Answered	349	352	342	354	329	347
	Not answered	8	5	15	3	28	10
		<b>Frequency</b>	<b>Percentage</b>	<b>cumulative percentage</b>			
Educational attainment	High school diploma	3	1				
	Associate degree	9	3				
	Bachelor degree	251	70				
	Master degree	91	25				
	Others	3	1				
	Assistant auditor	6	2				

Organizational position



	Auditor	97	27	29
	Senior auditor	98	28	57
	Head auditor	80	22	79
	Senior head auditor	48	13	92
	Others	28	8	100
Work experience	Less than 5 years	58	16	16
	5-10 years	97	27	43
	10-20 years	133	37	80
	20-30 years	58	16	96
	More than 30 years	1	1	97
	Others	10	3	100
Employment status	Corporate	2	1	1
	Contractual	35	10	11
	Official	307	86	97
	Others	13	3	100

### 6.3 Inferential statistics

#### 6.3.1 Normal distribution of data and variables

The normal distribution of variables was tested using the Kolmogorov-Smirnov (K.S) test. The results are shown in the following table.

Table 5: the Kolmogorov-Smirnov (K.S) test

Variable	K.S statistic	Level of significance
Performance audit of effectiveness	1.105	0.067
Organizational accountability	0.9023	0.089
legal accountability	0.599	0.058
professional accountability	0.9199	0.067
political accountability	0.676	0.087
financial accountability	0.8063	0.083
moral accountability	0.562	0.056
cultural accountability	0.8392	0.051
accountability	0.687	0.082

Since the level of significance of all variables is greater than 0.05, it can be concluded that the data followed a normal distribution. As a result, the Pearson correlation test, regression analysis, and path analysis were employed to test the hypotheses.

#### 6.3.2 Estimation of research models

The method of data analysis and research hypotheses is path analysis. In this method, we seek to analyze the relationships between three categories of variables including independent, dependent and intermediate variables, and since there is no hidden variable in this study, there is no need to use structural equation methods such as Amos, EQS, Mplus and LISREL is not. Also Developing regression models for research hypotheses required the fulfilment of three prerequisites and assumptions. Previously in this study, variables were measured at an interval level based on the Likert scale of questionnaires in SPSS and then the normal distribution of variables was tested by using the Kolmogorov-Smirnov test. In this section, the Pearson correlation test was employed to measure the correlation between independent and dependent variables. The following includes the results of analyzing variables and data through the Pearson correlation test and regression analysis in SPSS:

**A) The Results of Testing the First Hypothesis:** The null hypothesis is  $H_0$ ;  $P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of organizational accountability of executive agencies, and the alternative hypothesis is  $H_1$ ;  $P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for organizational accountability of executive agencies and performance audit of effectiveness were equal to 3.59 and 3.68, respectively. Considering the Pearson correlation ( $r=0.645$ ), there is a moderate correlation between the two variables. Since this coefficient is positive and direct, it can be stated that organizational accountability of executive agencies improves by increasing the implementation of performance audits of effectiveness. Given that the level of significance (Sig.= 0.000) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analysis show that the coefficient of determination is

equal to 0.844. This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson’s adjusted correlation coefficient is equal to 0.914, it can be concluded that 91.4% of changes in the dependent variables (improvement of organizational accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model. F. test value for overall significance of the regression model is equal to 2065.084. Considering that the significance level of the F. test value (Sig = 0.000) is smaller than 0.05. the null hypothesis was rejected with a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of organizational accountability) caused by the independent variable (performance audit of effectiveness).

Table 6:

		Variables	Effectiveness performance auditing	Organizational accountability
<b>Correlation test of hypotheses and research variables</b>		Type of variable	Independent	Dependent
		Mean	3.59	3.68
		Standard deviation	0.645	0.609
		Correlation coefficient	0.573	-
		Significance level	0.000	-
		Generalized coefficient of determination	0.914	-
Coefficient test		Coefficient of determination	0.844	-
		Adjusted coefficient of determination	0.844	-
		Estimated error	0.254	-
		Model	Regression	Residual
		sum of squares	124.578	13.015
		Degree of freedom	1	356
Linear regression test	Significance test	Mean squares	124.578	0.055
		Analyze of variance	2065.084	-
		Significance level	0.000	-
		Model	Independent variable	Intercept
Model development test		Standardized regression coefficient	0.928	0.231
		Regression error	0.011	0.067
		Standardized regression coefficient	0.914	-
		Multivariate distribution	35.543	2.999
		Significance level	0.000	-

The proposed operational regression model for the first hypothesis is as follows:

$$A_o(\text{organizational accountability}) = 0.231 + 0.928Pa_{ec}(\text{performance audit of effectiveness}) + 0.078$$

**B) The Results of Testing the Second Hypothesis:** The null hypothesis is  $H_0: P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of legal accountability of executive agencies, and the alternative hypothesis is  $H_1: P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for legal accountability of executive agencies and performance audit of effectiveness were equal to 3.74 and 3.93, respectively. Considering the Pearson correlation ( $r=0.672$ ), there is a strong correlation between the two variables. Since this coefficient is positive and direct, it can be stated that the legal accountability of executive agencies improves with the increase in the implementation of performance audits of effectiveness. Given that the level of significance (Sig = 0.000) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analyze show that the coefficient of determination is equal to 0.719. This indicates that there is a strong Pearson correlation between the two variables. On the other hand, as Pearson’s adjusted correlation coefficient is equal to 0.850, it can be concluded that 85.0% of changes in the dependent variables (improvement of legal accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model. The F-test value for the overall significance of the regression model is equal to 891,554. Considering that the significance level of the F. test value (Sig = .000) is smaller than 0.05. the null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of legal accountability) caused by the independent variable (performance audit of effectiveness).

The proposed operational regression model for the second hypothesis is as follows:

$$A_l(\text{legal accountability}) = 0.415 + 0.919Pa_{ec}(\text{performance audit of effectiveness}) + 0.156$$

Table 7:

		Variables	Effectiveness performance auditing	Legal accountability
<b>Correlation test of hypotheses and research variables</b>		Type of variable	Independent	Dependent
		Mean	3.74	3.93
		Standard deviation	0.660	0.644
		Correlation coefficient	0.672	–
		Significance level	0.000	–
		Generalized coefficient of determination	0.850	–
Coefficient test		Coefficient of determination	0.719	–
		Adjusted coefficient of determination	0.719	–
		Estimated error	0.385	–
		Model	Regression	Residual
		sum of squares	132.861	56.202
Linear regression test	Significance test	Degree of freedom	1	356
		Mean squares	132.861	0.149
		Analyze of variance	891.554	–
		Significance level	0.000	–
			Model	Independent variable
Model development test		Standardized regression coefficient	0.919	0.415
		Regression error	0.036	0.120
		Standardized regression coefficient	0.850	–
		Multivariate distribution	34.780	8.572
		Significance level	0.000	–

**C) The Results of Testing the Third Hypothesis:** The null hypothesis is  $H_0; P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of professional accountability of executive agencies, and the alternative hypothesis is  $H_1; P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for professional accountability of executive agencies and performance audit of effectiveness were equal to 3.65 and 3.86, respectively. Considering the Pearson correlation coefficient ( $r=0.56$ ), there is a strong correlation between the two variables. Since this coefficient is positive and direct, it can be stated that the professional accountability of executive agencies improves by increasing the implementation of performance audits of effectiveness. Given the fact that the level of significance ( $Sig = 0.000$ ) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analysis show that the coefficient of determination is equal to 0.808. This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson’s adjusted correlation coefficient is equal to 0.896, it can be concluded that 89.6% of changes in the dependent variables (improvement of professional accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model. F. test value for overall significance of the regression model is equal to 1533,756. Considering that the significance level of the F.test value ( $Sig = 0.000$ ) is smaller than 0.05. the null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of professional accountability) caused by the independent variable (performance audit of effectiveness).

The proposed operational regression model for the third hypothesis is as follows:

$$A_{pr}(\text{professional accountability}) = 0.124 + 0.967Pa_{ec}(\text{performance audit of effectiveness}) + 0.090$$

**D) The Results of Testing the Fourth Hypothesis:** The null hypothesis is  $H_0; P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of political accountability of executive agencies, and the alternative hypothesis is  $H_1; P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for political accountability of executive agencies and performance audit of effectiveness were equal to 3.79 and 4.1 respectively. Considering the Pearson correlation ( $r=0.511$ ), there is a moderate correlation between the two variables. Since this coefficient is positive and direct, it can be stated that the political accountability of executive agencies improves by increasing the implementation of performance audits of effectiveness. Given that the level of significance ( $Sig = 0.000$ ) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analysis show that the coefficient of determination is equal to 0.864.

Table 8:

		<b>Variables</b>	<b>Effectiveness performance auditing</b>	<b>Professional accountability</b>
<b>Correlation test of hypotheses and research variables</b>		Type of variable	Independent	Dependent
		Mean	3.65	3.86
		Standard deviation	0.65	0.661
		Correlation coefficient	0.56	–
		Significance level	0.000	–
Coefficient test		Generalized coefficient of determination	0.896	–
		Coefficient of determination	0.808	–
		Adjusted coefficient of determination	0.807	–
		Estimated error	0.302	–
		Model	Regression	Residual
Linear regression test	Significance test	sum of squares	139.622	33.366
		Degree of freedom	1	356
		Mean squares	139.622	0.089
		Analyze of variance	1533.756	–
		Significance level	0.000	–
Model development test		Model	Independent variable	Intercept
		Standardized regression coefficient	0.967	0.124
		Regression error	0.02	0.088
		Standardized regression coefficient	0.896	–
		Multivariate distribution	34.222	1.388
	Significance level	0.000	–	

This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson’s adjusted correlation coefficient is equal to 0.934, it can be concluded that 93.4% of changes in the dependent variables (improvement of political accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model F. test value for overall significance of the regression model is equal to 2088,617. Considering that the significance level of the F.test value (Sig = 0.000) is smaller than 0.05. The null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of political accountability) caused by the independent variable (performance audit of effectiveness).

Table 9:

		<b>Variables</b>	<b>Effectiveness performance auditing</b>	<b>Political accountability</b>
<b>Correlation test of hypotheses and research variables</b>		Type of variable	Independent	Dependent
		Mean	3.79	4.1
		Standard deviation	0.665	0.672
		Correlation coefficient	0.511	–
		Significance level	0.000	–
Coefficient test		Generalized coefficient of determination	0.934	–
		Coefficient of determination	0.864	–
		Adjusted coefficient of determination	0.864	–
		Estimated error	0.311	–
		Model	Regression	Residual
Linear regression test	Significance test	sum of squares	198.077	42.129
		Degree of freedom	1	356
		Mean squares	198.077	0.100
		Analyze of variance	2088.617	–
		Significance level	0.000	–
Model development test		Model	Independent variable	Intercept
		Standardized regression coefficient	1.119	–0.184
		Regression error	0.034	0.101
		Standardized regression coefficient	0.934	–
		Multivariate distribution	55.602	–10.220
	Significance level	0.000	–	

The proposed operational regression model for the fourth hypothesis is as follows:

$$A_{po}(\text{political accountability}) = -0.184 + 1.119P_{aec}(\text{performance audit of effectiveness}) + 0.135$$

**E) The Results of Testing the Fifth Hypothesis:** The null hypothesis is  $H_0; P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of financial accountability of executive agencies, and the alternative hypothesis is  $H_1; P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for financial accountability of executive agencies and performance audit of effectiveness were equal to 4.13 and 3.77, respectively. Considering the Pearson correlation ( $r=0.610$ ), there is a moderate correlation between the two variables. Since this coefficient is positive and direct, it can be stated that the financial accountability of executive agencies improves with the increase in the implementation of performance audits of effectiveness. Given that the level of significance ( $Sig = 0.000$ ) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analysis show that the coefficient of determination is equal to 0.861. This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson's adjusted correlation coefficient is equal to 0.865, it can be concluded that 86.5% of changes in the dependent variables (improvement of financial accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model F. test value for overall significance of the regression model is equal to 3041,529. Because the significance level of the F. test value ( $Sig = 0.000$ ) is smaller than 0.05, the null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of financial accountability) caused by the independent variable (performance audit of effectiveness).

Table 10:

		Variables	Effectiveness perfor- mance auditing	Financial ac- countability
Correlation test of hypotheses and research variables		Type of variable	Independent	Dependent
		Mean	4.13	3.77
		Standard deviation	0.577	0.583
		Correlation coefficient	0.610	-
		Significance level	0.000	-
Coefficient test		Generalized coefficient of deter- mination	0.861	-
		Coefficient of determination	0.865	-
		Adjusted coefficient of determi- nation	0.865	-
		Estimated error	0.295	-
		Model	Regression	Residual
Linear regression test		sum of squares	197.028	46.218
	Significance test	Degree of freedom	1	356
		Mean squares	197.028	0.928
		Analyze of variance	3041.529	-
		Significance level	0.000	-
Model development test		Model	Independent variable	Intercept
		Standardized regression coeffi- cient	4.309	-0.243
		Regression error	0.095	0.239
		Standardized regression coeffi- cient	0.861	-
		Multivariate distribution	52.239	8.533
	Significance level	0.000	-	

The proposed operational regression model for the fifth hypothesis is as follows:

$$A_f(\text{financial accountability}) = -0.243 + 4.309P_{aec}(\text{performance audit of effectiveness}) + 0.334$$

**F) The Results of Testing the Sixth Hypothesis:** The null hypothesis is  $H_0; P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of moral accountability of executive agencies, and the alternative hypothesis is  $H_1; P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for moral accountability of executive agencies and performance audit of effectiveness were equal to 4.70 and 4.54, respectively. Considering the Pearson correlation ( $r=0.513$ ), there is a moderate correlation between the two variables. Since this coefficient is positive

and direct, it can be stated that the moral accountability of executive agencies improves with the increase in the implementation of performance audits of effectiveness. Given that the level of significance (Sig = 0.000) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. In addition, the results of the regression analysis show that the coefficient of determination is equal to 0.744. This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson's adjusted correlation coefficient is equal to 0.848, it can be concluded that 84.8% of changes in the dependent variables (improvement of moral accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model. F. test value for overall significance of the regression model is equal to 1862.402. Considering that the significance level of the F. test value (Sig = 0.000) is smaller than 0.05, the null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of moral accountability) caused by the independent variable (performance audit of effectiveness).

Table 11:

		Variables	Effectiveness performance auditing	Moral accountability
Correlation test of hypotheses and research variables	Type of variable	Independent	Dependent	
	Mean	4.70	4.54	
	Standard deviation	0.616	0.579	
		Correlation coefficient	0.513	-
		Significance level	0.000	-
Linear regression test	Coefficient test	Generalized coefficient of determination	0.744	-
		Coefficient of determination	0.848	-
		Adjusted coefficient of determination	0.848	-
	Significance test	Estimated error	0.394	-
		Model	Regression	Residual
		sum of squares	154.470	14.213
Model development test	Degree of freedom	1	356	
	Mean squares	154.470	0.08	
	Analyze of variance	1862.402	-	
	Significance level	0.000	-	
Model development test	Model	Independent variable	Intercept	
	Standardized regression coefficient	1.044	-0.544	
	Regression error	0.013	0.079	
	Standardized regression coefficient	0.744	-	
	Multivariate distribution	27.223	-4.313	
		Significance level	0.000	-

The proposed operational regression model for the sixth hypothesis is as follows:

$$A_m(\text{moral accountability}) = -0.544 + 1.044P_{a_{ec}}(\text{performance audit of effectiveness}) + 0.099$$

**G) The Results of Testing the Seventh Hypothesis:** The null hypothesis is  $H_0; P = 0$ , indicating that there is no relationship between performance audit of effectiveness and improvement of cultural accountability of executive agencies, and the alternative hypothesis is  $H_1; P \neq 0$ , indicating that there is a relationship between them. According to the Pearson correlation test, the mean values obtained for cultural accountability of executive agencies and performance audit of effectiveness were equal to 4.21 and 4.43, respectively. Considering the Pearson correlation ( $r=0.522$ ), there is a moderate correlation between the two variables. Since this coefficient is positive and direct, it can be stated that the cultural accountability of executive agencies improves with the increase in the implementation of performance audits of effectiveness. Given that the level of significance (Sig = 0.000) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was

rejected. In addition, the results of the regression analysis show that the coefficient of determination is equal to 0.758. This indicates that there is a very strong Pearson correlation between the two variables. On the other hand, as Pearson's adjusted correlation coefficient is equal to 0.814, it can be concluded that 81.4% of changes in the dependent variables (improvement of cultural accountability) can be explained by the independent variable (performance audit of effectiveness) and the proposed regression model. The F-test value for the overall significance of the regression model is equal to 1870,502. Considering that the significance level of the F-test value (Sig = 0.000) is smaller than 0.05, the null hypothesis was rejected at a confidence level of 95%. This means that the proposed model can explain changes in the dependent variables (improvement of cultural accountability) caused by the independent variable (performance audit of effectiveness).

Table 12:

Correlation test of hypotheses and research variables		Variables	Effectiveness performance auditing	Moral accountability
		Type of variable	Independent	Dependent
	Mean	4.21	4.43	
	Standard deviation	0.552	0.577	
	Correlation coefficient	0.522	-	
	Significance level	0.000	-	
Linear regression test	Coefficient test	Generalized coefficient of determination	0.758	-
		Coefficient of determination	0.814	-
		Adjusted coefficient of determination	0.814	-
		Estimated error	0.213	-
	Significance test	Model	Regression	Residual
		sum of squares	171.051	31.221
		Degree of freedom	1	356
		Mean squares	171.051	0.095
		Analyze of variance	1870.502	-
		Significance level	0.000	-
	Model development test	Model	Independent variable	Intercept
		Standardized regression coefficient	1.042	-0.372
Regression error		0.031	0.095	
Standardized regression coefficient		0.758	-	
Multivariate distribution		42.885	-3.820	
	Significance level	0.000	-	

The proposed operational regression model for the seventh hypothesis is as follows:

$$A_u(\text{cultural accountability}) = -0.372 + 1.042Pa_{ec}(\text{performance audit of effectiveness}) + 0.126$$

### 6.3.3 Path analyzes test (independent variables model)

The path analyze test is the same as multiple regression analyze but is not between independent variables.

Table 13: Path analyzes test (independent variables model)

Model	Non-standardized regression coefficient	Regression error	Standardized regression coefficient	Multivariate distribution	Significance
Intercept	1.633	0.122	-	12.146	0.000
Organisational accountability	0.203	0.042	0.110	4.842	0.000
Legal accountability	0.046	0.058	0.046	0.003	0.035
Professional accountability	0.036	0.050	0.160	1.253	0.015
Political accountability	0.044	0.039	0.190	1.936	0.003
Financial accountability	0.323	0.046	0.110	2.33	0.002
Moral accountability	0.485	0.056	0.175	5.15	0.025
Cultural accountability	0.265	0.102	0.115	1.13	0.032

The causal model derived from the research is depicted in a path diagram. The path diagram is used to visualize

the relationships between the variables in the path analysis [5]. Considering the 8 hypotheses, the research operational model is as follows:

$$A \text{ (Accountability)} = 1.633 + 0.203 A_o \text{ (organizational accountability)} + 0.046 A_l \text{ (legal accountability)} + 0.036 A_{pr} \text{ (professional accountability)} + 0.044 A_{po} \text{ (political accountability)} + 0.323 A_f \text{ (financial accountability)} + 0.485 A_m \text{ (moral accountability)} + 0.265 A_c \text{ (cultural accountability)} + 0.515.$$

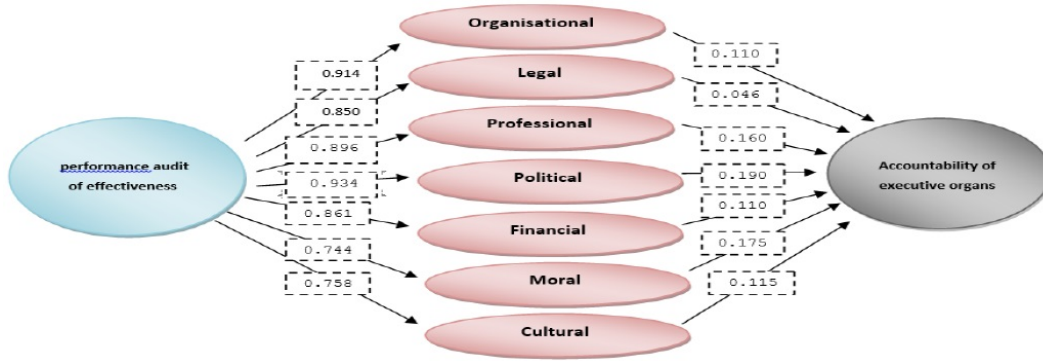


Figure 2: Path analysis algorithm (indirect effects)

According to the path analysis table and diagram, a performance audit of effectiveness improved the accountability of executive agencies and its 7 dimensions through direct and indirect paths. According to the results of testing the research hypotheses, the values of indirect effects of a performance audit of effectiveness on organizational, legal, professional, political, financial, moral, and cultural accountability were equal to 0.101, 0.039, 0.143, 0.177, 0.095, 0.130, and 0.87, respectively. The weighted mean of latent composite indices, as the indirect effect of this model, was obtained at 0.110.

Table 14:

Variable	Direct effect	Indirect effect	Overall effect
Performance audit of effectiveness – Organizational accountability	.	0.110 * 0.914	0.101
Performance audit of effectiveness – Legal accountability	.	0.046 * 0.850	0.039
Performance audit of effectiveness – Professional accountability	.	0.160 * 0.896	0.143
Performance audit of effectiveness – Political accountability	.	0.190 * 0.934	0.177
Performance audit of effectiveness – Financial accountability	.	0.110 * 0.861	0.095
Performance audit of effectiveness – Moral accountability	.	0.175 * 0.744	0.130
Performance audit of effectiveness – Cultural accountability	.	0.115 * 0.758	0.087
Performance audit of effectiveness – Accountability	-	-	0.110

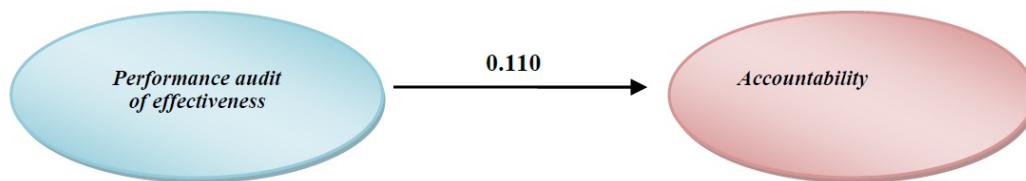


Figure 3: the path diagram

According to the path diagram, unexplained changes by the model are very high and equal to 0.890:

$$R^2 = 1 - E^2 \Rightarrow E^2 = 1 - R^2 \Rightarrow E^2 = 1 - 0.890 \Rightarrow E^2 = 0.110$$

Therefore, it can be stated that the obtained causal model does not explain 11% of the variance of the dependent variable (accountability of executive agencies) and 89% of changes in accountability of executive agencies caused by the implementation of a performance audit of effectiveness can be explained by this model.

**Convergent Validity, Divergent Validity, and Composite Validity:**

The average variance extracted and composite reliability were calculated for the two parameters, respectively, to measure the construct validity (reliability) and reliability (reliability) of the constructs. The AVE index indicates what



percentage of the variance of the structure under study was affected by the measures of that structure. The AVE index is used to measure validity and is also referred to as convergent validity. Researchers have set a value of 0.5 or higher for this attribute to be appropriate [7]. The composite reliability (CR) method was also used to determine the reliability of the constructs. If the CR value for structures is greater than 0.7, they show acceptable reliability, and the closer this value is to a structure, the greater the reliability of that structure. In this respect, Landa is the standardized factor load for each measure and the sigma variance of the error for each measure.

$$AVE = \frac{\sum_i^2}{\sum_i^2 + \sum_i var(\varepsilon_i)}$$

$$CR = \frac{(\sum_{i=1}^n \lambda_i)^2}{(\sum_{i=1}^n \lambda_i)^2 + (\sum_{i=1}^n \delta_i)}$$

Table 15: (AVE= Average Variance Extracted, CR= Composite Reliability, MSV= Maximum Shared Variance, ASV= Average Shared Variance)

Subscales	average	standard deviation	AVE	CR	MSV	ASV
performance audit of effectiveness	3.97	0.624	0.55	0.76	0.03	0.01
organizational accountability	3.68	0.645	0.61	0.75	0.013	0.011
Legal accountability	3.93	0.66	0.58	0.77	0.012	0.003
Professional accountability	3.86	0.65	0.56	0.78	0.04	0.02
political accountability	4.1	0.665	0.59	0.76	0.03	0.01
Financial accountability	3.77	0.577	0.62	0.73	0.006	0.011
Moral accountability	4.54	0.616	0.54	0.74	0.007	0.003
cultural accountability	4.43	0.552	0.55	0.75	0.007	0.004

The software output shows that:1) Index value (AVE) for all values greater than 0.5, so all variables convergent validity is confirmed, 2) Index value (AVE) for all variables more (MSV), so validity is confirmed in all variables and 3) Index (CR) for all values greater than 0.7, so the reliability of supplies is approved in all variables.

## 7 Discussion, conclusion, and recommendations

Despite presenting a new subject, this study lacked any theoretical background because of its novelty and was directly based on basic articles. Hence, a part of this doctoral dissertation in accounting dealt with the proposal of a path analysis for the relationship of performance audit of effectiveness, as an academic, efficient (internal), result-based, and feedback-based approach to supervision, and improvement of accountability in executive agencies. In terms of method, the present research was a correlational inductive-deductive study. When it comes to the inference method, it was a descriptive-analytical survey. To collect data, two author-made questionnaires based on a 5-point Likert scale were developed by reviewing specialized journals, papers, and books and consulting with experienced professors and expert auditors of the Supreme Audit Court of Iran (SAC). Cronbach's alpha coefficient was obtained at 0.93 for a performance audit of effectiveness and 0.94 for improvement of accountability. The results showed that both questionnaires had acceptable content validity and reliability. After approval by the Committee for the Formulation of Standards and Procedures for State Audit, questionnaires were distributed to the respondents (n=357), including managers, experts, and auditors of SAC. Then, the collected data were statistically analyzed through non-parametric tests (the Pearson correlation test), the one sample t-test, the independent t-test, regression analysis, and path analysis in SPSS. The results of exploratory analysis of the research statistics contained in the hypotheses, the Pearson correlation test, regression analysis, and path analysis indicated that:

The results from the model testing and path analysis algorithm showed that there was a high correlation between performance audit effectiveness and accountability improvement. Since this coefficient is positive and direct, accountability improves by enhancing the implementation of performance audits of effectiveness. Given the fact that the significance level (Sig = 0.000) is smaller than 0.05, this relationship was confirmed at a confidence level of 95% and the null hypothesis was rejected. After calculating the direct and indirect effects of independent variables on the accountability of executive agencies, a performance audit of effectiveness exhibited an incremental impact on the accountability of executive agencies, regarding all direct and indirect paths. This means that the accountability of executive agencies has improved wherever a performance audit of effectiveness is implemented. However, this impact was lower in legal accountability. The path analysis of the effects of independent variables and calculation of the intensity of direct and indirect effects indicated that the highest changes in dependent variables were related to political

and professional accountability. The coefficient of determination was used to calculate the extent of explaining the variation of the dependent variable. As shown in the path diagram, the obtained causal model does not explain 89% of the variance of the dependent variable (accountability of executive agencies) and 11% of changes in accountability of executive agencies caused by the implementation of a performance audit of effectiveness can be explained by this model. Regardless of the research methodology as well as the variables and indicators used, the results of this study are consistent with the findings of Reichborn-Kjennerud and Vabo [13], Mahmoud Khani and Ahmadi [9], Babajani and Jabarian [1], Kamyabi et al. [8].

Based on the results of the hypothesis test and the path analysis model of the research subject, it is recommended that the auditors of The Supreme Audit Court perform an effective performance audit based on the variables studied in this study to improve the organization's accountability through the relevant variables. Executive agencies are also encouraged to consider the variables studied in the context of accountability to improve accountability.

Finally, the following recommendations are presented for future studies:

- It is recommended to analyze the effect of a performance audit of effectiveness on the social accountability of executive agencies.
- It is recommended to study the effect of a performance audit of effectiveness on the basic pillars of the operational budgeting system in executive agencies.
- It is recommended to analyze the quality of implementing performance audit of effectiveness and its relationship with the auditor's characteristics and accountability of executive agencies.
- It is recommended to study the effect of different types of performance auditing (effectiveness, effectiveness, and economy) on the accountability of executive agencies.
- It is recommended to analyze the effect of a performance audit of effectiveness on the stock indices of companies listed on the stock exchange.

## 8 Research constraints

Problems, constraints, and failures are inevitable parts of every work of research. Since there was no standard questionnaire on accountability and performance audit of effectiveness, great efforts were made in this study to identify the relevant indicators. In addition, we needed to use the expertise of experienced professors and experts in the field of auditing and get the approval of the Committee for the Formulation of Standards and Procedures for State Audit. This slowed down the research process. On the other hand, since this study was carried out at the national level, it took a long time and cost much to distribute and gather the questionnaires.

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