

**ISSUES OF MATHEMATIC MODELS AT
GENERALIZATION OF AUDITOR'S REPORTS IN
UZBEKISTAN**

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Abstract. This article is devoted to the consideration of theoretical issues of compiling and generalizing auditor's reports on the basis of the International Auditing Standards (IAS) with the account of scientific and practical data.

Key words: International Auditing Standards (IAS), audit evidence, auditor's report and its components, auditor's conclusion, modified auditor's report, guideline letter.

Introduction. Under conditions of the economy modernization, the strategic decision-making by foreign investors will be mainly connected with the reliability and transparency of the financial statements. Under these circumstances the fact how fully a foreign investor understands and analyzes financial reporting of the national companies illustrating their performance can affect the decision-making process. Currently 143 accountants and auditors from 104 countries of the world are the members of the Council for International Financial Reporting Standards and they are undertaking all efforts to implement international standards in practice. Preparation of financial statements based on international standards for their users, as well as performing audit in compliance with international standards are related to the submission of the appropriate auditor's conclusion (www.ifrs.org).

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In recent years the Republic of Uzbekistan has been working on solving the problem of business development and efficient management, application of IFRS, as well as application of internal and external audit through the introduction of the International Auditing Standards and quality assurance in business.

In particular, a new edition of the Law “On audit activities”, a new edition of the national standards of audit activities (NSAA), in particular, NSAA №70 “On Auditors’ Report and Financial Reporting” (November 9, 2016) (NSAA №70) is one of the most important steps undertaken in this area. As a result, systematic measures have been implemented to regulate this sector including the preparation and generalization of auditor’s reports, and the proper organization and performance of audit activities.

According to the international audit practice, one of the key issues in audit activities is the provision of necessary information to clients by formalizing audit evidence based on the data collected and its analysis needed for the auditor’s report. Thus the main aim is paying a particular attention to the profitability, liquidity and solvency of economic entities which as a result will lead to the audit results provided by the auditor. This situation requires the assessment and improvement of external audit procedures in the preparation of financial statements of economic entities.

Therefore, an important issue in the auditor’s report is how the information about the organization of the customer internal control and the results of inspecting his conditions should be. In our opinion, the audit company should focus on the following points in the process of internal audit:

- an auditor’s assessment of the organization of the internal control system in accordance with the scope and nature of the subject’s activities;

- a statement of the non-compliance of internal control system identified during the external audit with the scope and nature of the customer’s performance;

- a statement on the results of the external auditor’s report on the customers’s accounting and financial reporting status;

- an assessment of the compliance of accounting and financial reporting conducted by the economic entity with the established order.

Literature review. The issues of auditor's report, namely, the definition of the auditor's report and the recommendations on the auditor's report compilation have been researched in scientific papers of such foreign scientists as A.N. Azriliyan, B.T. Jarylgasova, O.E. Nikolaeva, A.E. Suglobov, as well as domestic scientists R.D. Dismuratov, A.K. Ibragimov (Dictionary, 2002). However, in the process of considering an auditor's report and auditor's conclusion, we believe that the auditor's report has a more comprehensive meaning and should be based on the audit evidence collected in the auditing process. Herein, this report should be named as "Independent auditor's report", and an auditor's conclusion must be named as "Independent auditor's conclusion".

Having considered and generalized all these opinions it should be noted that an auditor's report and an auditor's conclusion differ from each other in their essence. In our opinion, we can propose the following author's definition to the term "Auditor's report is a disclaimer thereof, issued by either an internal auditor or an independent external auditor as a result of an internal or external audit, as an assurance service in order for the user to make decisions based on the results of the audit. It also includes audit evidence collected in the process of audit". In addition to the auditor's report, there is prepared a letter to the board of directors which contains a description of the reasons for the misstatement and infringing the regularities in the audit process, as well as recommendations for their elimination, practical advice and recommendations to improve the efficiency of financial and economic activities.

The following criteria can be used to determine the objects selected for the audit: reliability, accuracy, timeliness and completeness. Therefore, taking into account the above-mentioned statements we are proposing the method of analysis using the criteria of reliability and accuracy to maintain the objectivity and transparency of accounting information.

The following formula is used to calculate the indicators stated above (Gmurman, 2003):

a) The criterion for the information reliability is represented as ($\chi_1 \in [0;1]$)

$$\chi_1 = \frac{1}{n} \sum_{i=1}^n \frac{|X_i - X_i^*|}{|X_i^*|} \quad (1)$$

While calculating it the data contained in the accounting reports shouldn't be twice more than the data determined by the auditor.

Here: n – number of indicators in the financial report; i - indicator value (in thousand UZS) of X_i – financial report based on the accounting data; i - indicator value (in thousand UZS) of X_i^* – the financial report based on the auditor's data.

b) Accuracy criterion of the information ($\chi_2 \in [0;1]$)

$$\chi_2 = \frac{|M_1 - M_2|}{\sqrt{m_1^2 + m_2^2}} \quad (2)$$

Here: M_1 – overall income of the enterprise based on the accounting data; M_2 – overall expenses of the enterprise based on the accounting data; $m_i = \frac{\sigma_i}{\sqrt{n_i}}$ – average error of average arithmetic value of studied i magnitude; $\sigma_i = \sqrt{X_i^2 - (\bar{X}_i)^2}$ – average squared deviation; n_i – studied i magnitude volume (here $i = 1; 2$).

In the research basing on the above-stated criterion it is proposed to use the method of determining and analyzing the integral criterion ($\chi \in [0;1]$) basing on the λ – significance to formulate overall value of the accounting information.

In determining the integral criterion, on the basis of the auditor's opinion the weight of each criterion is taken into consideration and it is determined according to the following formula:

$$\chi = \sum_{i=1}^s v_i \chi_i \quad (3)$$

Here: i - value of private criterion in determining quality of χ_i – financial

reporting data; i - weight of private criterion in determining quality of v_i – financial reporting data.

Basing on the auditor's integral criterion it is possible to make the following conclusion: a) if $\chi > \lambda$, in this case an auditor's conclusion is negative; b) if $\chi < \lambda$, in this case an auditor's conclusion is positive.

This article proposes the classification of positive auditor's conclusion, namely, the method which takes into account 2-degree criterion ($\chi_{назорат} \in [0;1]$). This control criterion is determined as it follows:

$$\chi_{назорат} = \sum_{i=2}^s v_i^* \chi_i \quad (4)$$

Here: $v_i^* = \frac{v_i}{v^*}$, $v^* = \sum_{i=1}^s v_i$. If $\chi_{назорат} = 0$, in this case the quality of the information accounts for 100%.

On the basis of the control criterion the following conclusion can be made:

a) if $\chi \leq \lambda \leq \chi_{назорат}$, in this case an auditor's opinion can be modified;

b) if $\begin{cases} \chi \leq \lambda, \\ \chi_{назорат} \leq \lambda \end{cases}$, in this case an auditor's conclusion is considered to be positive.

Analysis. The following indicators have been obtained in the result of the auditing financial reporting data of the business entities subject to compulsory audits operating under the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan and the "Tashkent grain products" JSC (Table 1).

Table 1.

Analysis of the audit results of performed at the economic entities on the basis of mathematical modeling methods¹

¹ Developed by the author on the basis of the mathematical modeling methods of the results of audits conducted at economic entities.

Indicators	“Gafur Gulom” Karakul sheep raising farm	“Halqobod” Karakul sheep raising farm	“Guzor” Karakul sheep raising farm	“Tashkent grain products” JSC	“Kukcha” Karakul sheep raising farm
χ_1 %	1,6	2,5	2	1,4	2,5
χ_2 %	10,6	21	26	2,3	54
χ %	5,5	13,2	14,1	2,8	24,7
$\chi_{\text{нвзорат}}$ %	3,9	-	12,23	1,1	-
λ Significance %	13,5	11,9	17,8	8,20	10,7
Auditor’s conclusion	positive	negative	positive	positive	negative

Based on the mathematical modeling method, we can see that there are 3 positive and 2 negative conclusions on the selected object and the reason for it is connection of the significance indicators with the integral criterion.

The audit company should observe the uniformity of the auditor’s reports on the results of examining specific issues. In our opinion, it is necessary to determine the structure of the auditor’s report based on the results of some issues raised in the developed standard which should reflect the following elements:

first of all, an audit is performed indicating the specific issues being investigated in the title of the report;

each page of the auditor’s report on a investigating a specific issue must be signed by an auditor (s) who conducts an audit of this specific issue.

If necessary, an auditor should provide recommendations and suggestions aimed at eliminating the weaknesses determined in the auditing process that will raise the efficiency of the audit object in compliance with the established order.

If an auditor cannot give any comments on the object of the same investigation,

he must include an additional section explaining the essential points of his decision before developing the final part.

In Uzbekistan auditor's reports drawn up by auditors participated in the process of inspections, their generalization, as well as general methodology of developing an auditor's report and auditor's conclusion by each audited client is considered to be an important issue.

Conclusion and recommendatins. From our point of view the improvement of the methodology for compiling auditor's reports should be carried out in the following directions:

- the first direction identifies the difference between an auditor's report on a particular audit and an auditor's report on the overall financial reporting. After compiling the contract on conducting an audit, the leader (partner) on audit performance identifies an audit plan, audit program, and personnel involved in the audit process, as well as the tasks assigned. Further an audit team is appointed to perform these tasks effectively and timely. This team is given instructions on the respective tasks and the manner in which they are to be performed, and the schedules to be filled in by the audited entity before the commencement of the audit are determined;

- the second direction is designed to develop a control sheet (card) for the activities performed by an auditor's assistant, an auditor, and a chief auditor in performing auditing process. Since through this checklist the control is performed and after an audit an employee who has a definite role in resolving disputes over the problematic issues that arise after an audit, and an employee who supervises it because after the audit completion it will enable to supervise over problematic issues and the official who is responsible for them;

- the third direction is the issue of whether the auditor's report is structured in a particular sequence, depending on the plan and the functions of each employee determined by the program. This sequence is developed separately by an auditor or an auditor assistant and further this sequence has to be maintained. In addition, in some cases an auditor may have more than one important issue, namely, a plan-based audit

which may include assignments for clarifying some issues related to the audit;

- the fourth direction involves improvement of the analytical practice. Based on international experience and practice, the national and international standards for analytical practice have been analyzed. It should be noted that regarding this issue there are the international auditing standards which are incorporated in practice by the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan. So auditor's reports and auditor's conclusion should be understandable for foreign investor in order to convey them relevant necessary information;

- the fifth direction is the development of an auditor's report form by specific issues. The fact that no general order on this issue has been raised necessity to research this issue. In the process of conducting audit of specific issues, the issues faced by an auditor should be divided into general and specific forms. In this regard, depending on the auditor's responsibilities, analytical activities are carried out on the basis of the auditor's plan and program developed on the issues. Examination of these issues starts with a review of accounting records, information on accounts, financial reports and information provision. All above mentioned serves as a basis for audit team formation.

Analytical activities also serve as a basis for evaluating financial information based on the study of mutual objective relationships between financial and non-financial information, i.e. if they are accumulated at the sufficient level and how properly they assess performance of entities

Various methods are used by the auditors in the process of performing analytic activities. They can vary from simple comparisons to complex analysis conducted with the application of complex statistical methods. Analytical actions may be applied to the consolidated financial statements, as well as separate components and elements of the financial information. It should be noted that, in some cases, even the complex model of forecasting can be effective when it is used as analytical one. For example, if the wage rate and the number of employees have not changed over the whole period, the auditor will use it for a more precise assessment of the total labor costs for that period. In this way, it reduces the need for more detailed tests to provide

audit evidence. Additionally, detailed tests are used to obtain audit evidence in the process of audit activities. For example, when assessing the receivable balance, auditor evidence requires an auditor to take analytical activities in addition to detailed tests of future cash flows in determining the maturity of customers.

Audit reports may differ depending on the nature of the work being performed. The following International Auditing Standards (IAS) 700-799 “Auditor’s Conclusions and Reports”, 700-“Receiving opinion on the financial report and giving report(conclusion)”, 705- “Modification of the idea of the independent auditor’s report(conclusion)”, 706-“Explanatory paragraphs of independent auditor’s report(conclusion) and paragraphs on other issues”, 710-“Comparative information – comparative indicators and comparative financial reports”, 720-“Auditor’s responsibility to the reliability of the information in the audited financial reporting” and IAS 800-899 – “Specific fields” group which includes 800-“Specific issues- audit of financial reports prepared for specific purposes”, 805-“Specific issues – audit of financial reports and specific elements, accounts or articles contained in the financial reports”, 810-“Agreements on submitting reports(conclusions) on shortened financial reports” have been renamed and on their basis the following National Standards of audit activities have been issued in a new edition: 70-“Auditor’s report and auditor’s conclusion on the financial report” and 80-“Auditor’s report on the examination of specific issues”. Moreover, it also requires the development of a national auditing standards in the Republic of Uzbekistan in terms of improving an auditor’s report and formulating a modified auditor’s report and auditor’s conclusion. In particular, there was a need to develop a special standard (NSAA 75) “Modified Auditor’s Report and Auditor’s Conclusion”. Therefore, an auditor’s report and its auditor’s conclusion have been developed in order to include a modified auditor’s report, peculiarities of the auditing process as well as a form of the auditor’s report conducted in the entities engaged in manufacturing of agricultural products on their own initiative.

Conclusions

1. As a result of this research a special mathematical apparatus has been

developed to provide accuracy and reliability of the indicators of some economic entities' performance. The application of this technique enables to assess audit evidence, and as a result, leads to the automatic formation of the mathematical accounts.

2. As a result of the measures undertaken improve an auditor's report, the hours spent by the auditor will decrease by 2 person per hour for the external audit of each joint-stock company. This has lead to the economy of 90,300,000 UZS (if the prime cost of auditor's hour accounts for 15,000 UZS).

3. An auditor should observe the use of the uniformity of the auditor's report by the results of examining specific issues. For this purpose, the alternative option of the auditor's report proposed by the author will enable the development of a simplified procedure for checking these issues and preparing an auditor's report with the account of their results. At the same time, the general form of the auditor's report on the examination of specific issues has been developed which has led to the determination of the main indicators, analytical data and the submission order. In case of necessity an auditor's report can be developed to provide recommendations and proposals that lead to the elimination of identified deficiencies in the audit, which, in turn, will enhance productivity and effectiveness of the audited object. If an auditor can not provide his opinion on the audited object he must include an additional part which explains the essential points of his decision before the final part. An auditor uses the basis described in the additional part to formulate an opinion in the final part of his report. An auditor should observe the uniformity of an auditor's report on the results of the audit.

4. With the regard of foreign experience and international standards the way how an auditor presents an auditor's report and conclusion to the economic entity is considered to be important. Therefore, it was necessary to develop the national standard 75 called "Modified Auditor's Report and Auditor's Conclusion". Therefore, an auditor's report and its auditor's conclusion have been developed in order to include a modified auditor's report, peculiarities of the auditing process as well as a form of the auditor's report conducted in the entities engaged in

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