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INTEGRATED INDEX MODEL FOR THE COMPREHENSIVE ASSESSMENT OF INTERNAL AUDIT EFFECTIVENESS IN COMMERCIAL BANKS

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Abstract. The article proposes a multifactor integral index model for the comprehensive assessment of internal audit effectiveness in commercial banks. The model includes four blocks: audit coverage, audit quality, risk detection capability, and the implementation rate of recommendations. Block weights are determined using Saaty's Analytic Hierarchy Process and international empirical evidence. Testing the model using data from eight leading banks in Uzbekistan showed an average index value of **0.64**, which remains below the international benchmark. Proposals are developed for applying the model in supervisory practice and in banks' quality assurance and improvement programs.

Keywords: internal audit effectiveness, integral index, commercial banks, audit coverage, audit quality, risk detection, implementation of recommendations, AHP method, benchmarking.

Аннотация. В статье предложена многофакторная интегральная индексная модель комплексной оценки эффективности внутреннего аудита в коммерческих банках. Модель включает четыре ключевых блока: охват внутреннего аудита, качество аудиторской деятельности, способность выявления рисков и уровень реализации аудиторских рекомендаций. Весовые коэффициенты блоков определены с использованием метода анализа иерархий Т. Саати и результатов международных эмпирических исследований. Апробация модели на данных восьми ведущих коммерческих банков Узбекистана показала, что среднее значение интегрального индекса составляет 0,64, что ниже международного эталонного уровня. Разработаны предложения по применению модели в практике банковского надзора, а также в программах обеспечения и повышения качества внутреннего аудита коммерческих банков.

Ключевые слова: эффективность внутреннего аудита, интегральный индекс, коммерческие банки, охват аудита, качество аудита, выявление рисков, реализация аудиторских рекомендаций, метод анализа иерархий (AHP), бенчмаркинг.

INTRODUCTION

As the role of internal audit services in commercial banks continues to expand, the question of how effectively internal audit functions has become one of the central issues in both theory and practice. Within the framework of banking system reforms in Uzbekistan, internal audit services have been established in all major banks, audit committees are operating, and both audit coverage and the implementation of recommendations are increasing year by year.

However, a unified, scientifically grounded, and comparable tool for measuring the effectiveness of internal audit activities has not yet been developed. Banks use various internal indicators, which makes it difficult to conduct interbank comparisons, monitor performance dynamics, and obtain a holistic picture for the supervisory authority.

LITERATURE REVIEW

The problem of internal audit effectiveness has been studied in foreign literature in three main directions. The first direction is the determinants approach, which focuses on the empirical identification of factors affecting effectiveness. In particular, it has been proven that top management support, organizational independence, and auditor qualifications are decisive factors in internal audit effectiveness (Cohen and Sayag, 2010). The scope of the audit service, operational characteristics, and relationships with stakeholders have also been identified as important organizational drivers (Arena and Azzone, 2009). In the context of developing countries, the implementation of audit recommendations by management has been emphasized as a key indicator of effectiveness (Mihret and Yismaw, 2007).

The second direction is the measurement, or operationalization, approach. A synthesis of empirical literature shows that researchers have not reached a unified conclusion on how to measure effectiveness. Some studies use process indicators, others focus on stakeholder satisfaction, while others rely on outcome indicators (Lenz and Hahn, 2015). Subsequent attempts to operationalize the concept of effectiveness and systematize the factors influencing it have also not fully eliminated the diversity of criteria (Turetken et al., 2020). At the same time, the impact of internal audit function characteristics on the quality of internal control has been empirically confirmed (Oussii and Boulila Taktak, 2018).

The third direction is the value approach, which emphasizes assessing the value added by internal audit to the organization. Studies have examined internal auditors' perceptions of their ability to add value and have shown that value is a multidimensional category (D'Onza et al., 2015). Practical methods for identifying, measuring, and communicating this value to stakeholders have also been systematized (Eulerich and Lenz, 2020). It has been noted that performance criteria are expanding further in the digital environment (Betti and Sarens, 2021), while the future role of internal audit is increasingly viewed through the balance between assurance and advisory functions (Lenz and Jeppesen, 2022).

RESEARCH METHODOLOGY

The research is based on a pragmatic philosophy and follows a deductive approach: a clear calculation algorithm for national practice is derived from the requirements of international standards. The research design has a methodological and practical character and consists of two components. The first involves developing the theoretical framework of the methodology, while the second focuses on testing it through a practical example within a case study strategy.

The following methods were used in the research process: comparative analysis, a systematic approach, mathematical modelling, case study, tabular and graphical methods, and forecasting.

ANALYSIS AND RESULTS

Before validating the model, the main approaches to assessing internal audit effectiveness were compared according to common criteria, as presented in Table 1.

Table 1
Comparative analysis of internal audit performance evaluation approaches[1]

Approach (representatives)	Evaluation criteria	Advantage	Limit
Determinants (Arena and Azzone, 2009; Cohen and Sayag, 2010)	Management support, independence, competence, resources	Identifies influencing factors	It does not measure the result itself
Resultant (Mihret and Yismaw, 2007)	Implementation of recommendations, significance of findings	Close to the practical result	One-dimensional, does not cover the aspect of quality
Value approach (D'Onza et al., 2015; Eulerich and Lenz, 2020)	Stakeholder satisfaction, added value	Reflects a strategic role	Subjectivity is high, comparison is difficult
Normative quality (IIA, 2024 — QAIP)	Compliance with standards, quality assessments	It relies on international standards	No numerical representation of efficiency
A proposed integrated approach	Blocks Q, S, R, T — integral index	Multifactorial, comparable, observable in dynamics	Data requires discipline

The analysis revealed the advantages of each approach, as well as their limitations as comprehensive measurement tools. Based on the results of the analysis, a model was developed that fully represents efficiency through four blocks (Figure 1).

1 Prepared by the author

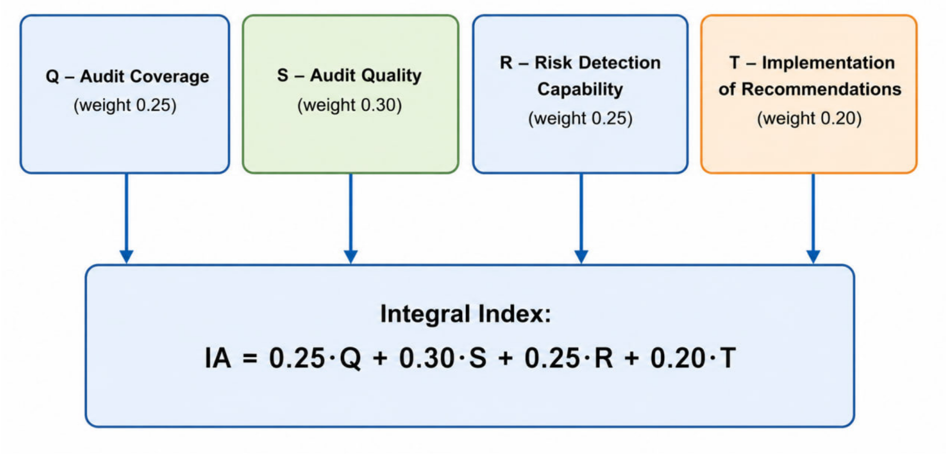

Figure 1. The four-block structure of the integral index model[2]

The first block — audit coverage (Q) — reflects the percentage of the audit universe covered, the coverage of high-risk objects and the implementation of the annual plan; the second block — audit quality (S) — the compliance of working papers with standards, the results of internal quality assessments and the satisfaction of the audit committee; the third block — risk detection ability (R) — the percentage of findings in high-risk areas, the identification of problems at an early stage and confirmed warnings; the fourth block — the level of implementation of recommendations (T) — reflects the percentage of recommendations implemented within the specified time frame and the reduction of recurring findings (Table 2).

Table 2
The composition of integral index blocks and private indicators[3]

Block	Weight	Private indicators	Source of information
Q-audit scope	0.25	Coverage of audit universe; coverage of high-risk facilities; implementation of the annual plan	Audit plans and reports
S-audit quality	0.30	Compliance of working papers with standards; internal quality assessments; audit committee satisfaction rating	QAIP documents, requests
R-Risk detection ability	0.25	Percentage of findings in high-risk areas; early detection of problems; confirmed warnings	Register of audit findings
Implementation of T-recommendations	0.20	Percentage of recommendations completed on time; reduction of duplicate findings	Implementation verification monitoring

Aggregation of blocks is performed by linear averaging, and the integral index is calculated as follows:

$$IA = 0.25 \cdot Q + 0.30 \cdot S + 0.25 \cdot R + 0.20 \cdot T$$

The higher weight assigned to the audit quality block is based on the AHP results. According to expert assessments, a poorly performed audit cannot provide reliable assurance, regardless of the scope of audit coverage or the number of findings. This conclusion is consistent with international empirical evidence emphasizing the priority of the quality factor (Lenz and Hahn, 2015; Oussii and Boulila Taktak, 2018).

A four-level scale is proposed for interpreting the index values: 0.80 and above indicates an international leading level; 0.65–0.79 indicates a high level; 0.50–0.64 indicates a medium level; and below 0.50 indicates a low level.

Before calculating the index, the dynamics of the main indicators forming its information base were analyzed, as shown in Figure 2. In 2020–2024, audit coverage in leading banks increased on average from 55% to 68%, while the implementation rate of recommendations increased from 54% to 68%. However, both indicators remain significantly below the 80% threshold, which is considered a minimum benchmark in international practice (Figure 2).

2 Prepared by the author
3 Prepared by the author

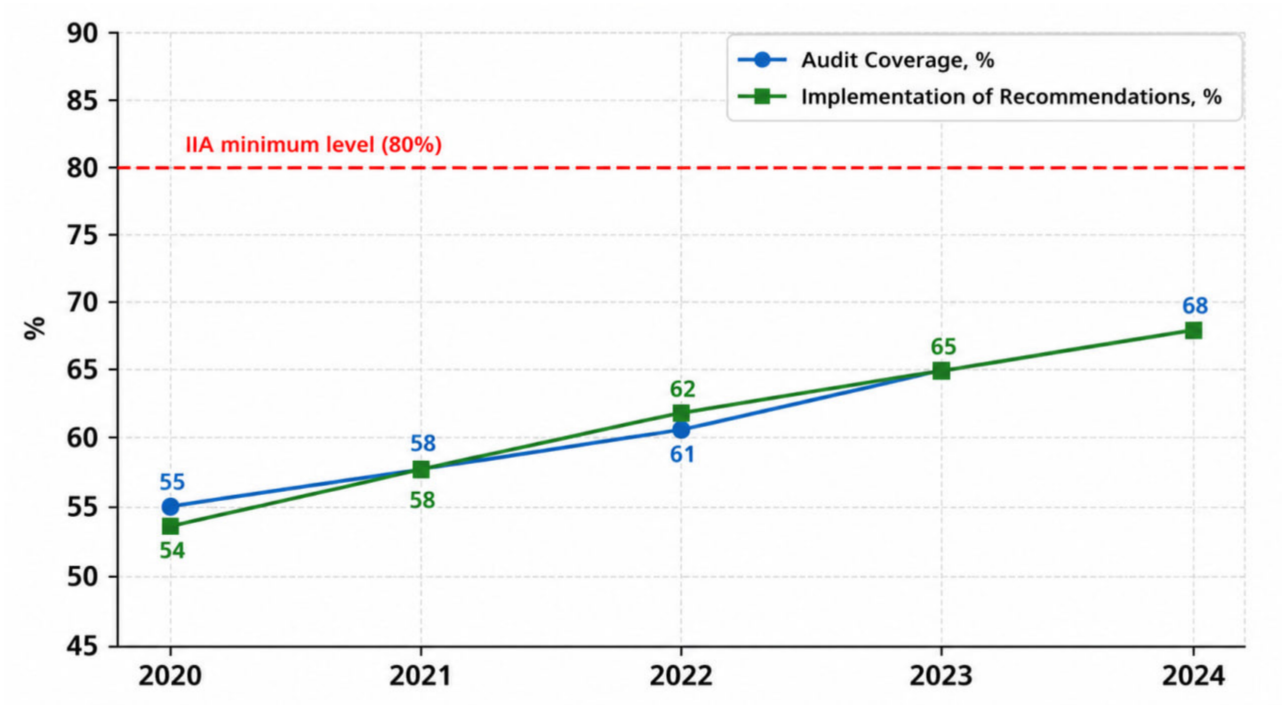

Figure 2. Dynamics of audit coverage and implementation of recommendations, 2020–2024 (author's calculations based on data from banks)[4]

The block values and integral index results calculated based on the results of 2024 for the eight leading banks are presented in Table 3.

Table 3
Integral index calculation for leading banks (2024)[5]

Bank	Q	S	R	T	IA index
Bank A	0.75	0.72	0.70	0.70	**0.72**
Bank B	0.72	0.70	0.68	0.70	**0.70**
Bank C	0.70	0.68	0.66	0.68	**0.68**
Bank D	0.68	0.67	0.66	0.67	**0.67**
E-bank	0.67	0.66	0.65	0.66	**0.66**
Bank F	0.62	0.60	0.58	0.60	**0.60**
G Bank	0.60	0.58	0.56	0.58	**0.58**
H bank	0.57	0.55	0.53	0.55	**0.55**
Average	0.66	0.65	0.63	0.64	0.64

The calculations led to the following conclusions. First, the index values ranged from 0.55 to 0.72, with an average of 0.64 — which corresponds to the upper limit of the "medium level" on the proposed scale and is significantly lower than the leading international criterion (0.80). Second, a clear differentiation is observed between banks: the first five banks are in the "high level" category, while the rest remain in the medium level; this difference is mainly due to differences in the S (quality) and R (risk identification) blocks. Third, the R block was found to be the weakest link in all banks — this indicates that internal audit is still focused on retrospective verification and a risk-oriented approach has not been fully implemented.

The future target trajectory of the index was determined based on the scenario approach: it is realistic to bring the index to 0.73 in 2026, 0.78 in 2027, and 0.82 in 2028 due to the full implementation of risk-oriented planning, the launch of quality assurance programs, and the automation of monitoring of recommendations - i.e., passing the international benchmark (Figure 3).

4 Prepared by the author
5 Prepared by the author

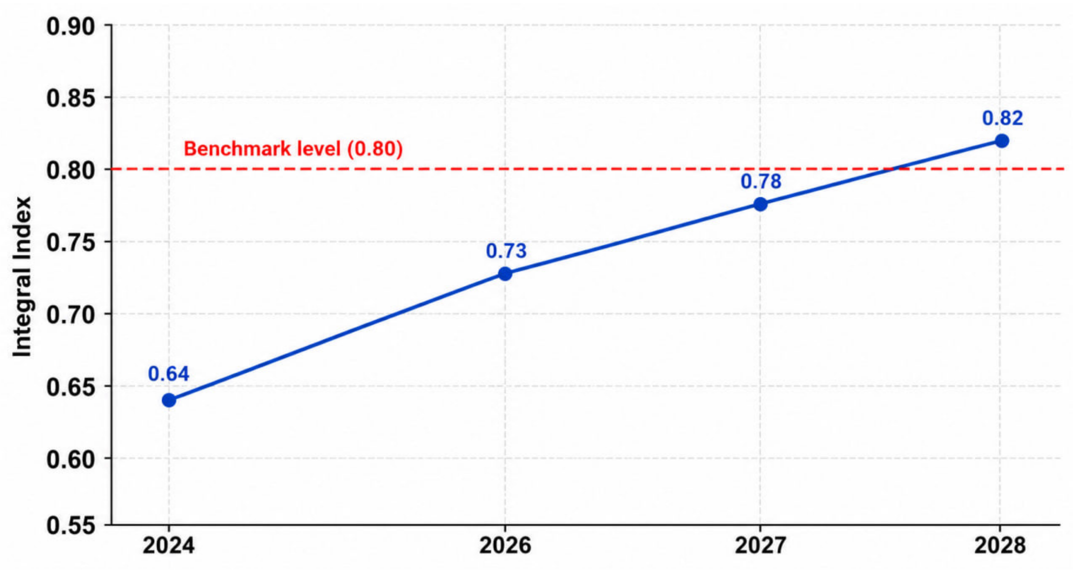

Figure 3. The forecast trajectory of the integral index for 2024–2028 (author's calculation)[6]

The discussion of the results shows that the proposed model combines three approaches in the literature - determinants, outcome and value approaches - into a single measurement system, thereby mitigating the limitations inherent in each of them. The block structure of the index also performs a diagnostic function: it indicates which block is responsible for the low overall value and identifies specific points for management intervention.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, the following conclusions and recommendations were formulated.

Existing approaches to assessing internal audit effectiveness are fragmented and do not provide a comprehensive and comparable measurement tool for the banking sector. To address this gap, a four-block integral index model was developed, including audit coverage, audit quality, risk detection capability, and implementation of recommendations. The block weights 0.25, 0.30, 0.25, and 0.20 were scientifically justified using Saaty's AHP method and international empirical research.

Testing the model using data from eight leading banks showed that the index ranged from 0.55 to 0.72, with an average value of 0.64. This is below the international benchmark of 0.80, while the weakest component was identified as the risk detection block.

Commercial banks are recommended to introduce the integral index as the core measurement tool of the Quality Assurance and Improvement Program (QAIP), calculate the index quarterly, and include the results in the reporting system submitted to the audit committee.

It is proposed that the Central Bank use the model as a tool for remote assessment, interbank benchmarking, and evaluation of the internal audit function in supervisory practice, as well as formalize the index methodology in the form of methodological recommendations.

REFERENCES

1. Arena, M., & Azzone, G. (2009). Identifying organizational drivers of internal audit effectiveness. *International Journal of Auditing*, 13(1), 43–60.

2. Cohen, A., & Sayag, G. (2010). The effectiveness of internal auditing: An empirical examination of its determinants in Israeli organizations. *Australian Accounting Review*, 20(3), 296–307.

3. D'Onza, G., Selim, G. M., Melville, R., & Allegrini, M. (2015). A study on internal auditors' perceptions of the function's ability to add value. *International Journal of Auditing*, 19(3), 182–194.

4. Eulerich, M., & Lenz, R. (2020). *Defining, Measuring, and Communicating the Value of Internal Audit*. Lake Mary, FL: Internal Audit Foundation.

5. Lenz, R., & Jeppesen, K. K. (2022). The future of internal auditing: Gardener of governance. *EDPACS*, 66(5), 1–21.

6 Prepared by the author

6. Mihret, D. G., & Yismaw, A. W. (2007). Internal audit effectiveness: An Ethiopian public sector case study. *Managerial Auditing Journal*, 22(5), 470–484.

7. Oussii, A. A., & Boulila Taktak, N. (2018). The impact of internal audit function characteristics on internal control quality. *Managerial Auditing Journal*, 33(5), 450–469.

8. Saaty, T. L. (2008). Decision making with the analytic hierarchy process. *International Journal of Services Sciences*, 1(1), 83–98.

9. Sarens, G., De Beelde, I., & Everaert, P. (2009). Internal audit: A comfort provider to the audit committee. *The British Accounting Review*, 41(2), 90–106.

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