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IMPROVING THE INTERNAL AUDIT OF FINANCIAL ERRORS AND IRREGULARITIES IN BUDGET ORGANIZATIONS THROUGH A RISK-BASED APPROACH

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Abstract. The article substantiates the application of a risk-based approach to the internal audit of financial errors and irregularities in budget organizations. The conceptual foundations of this approach are examined on the basis of the COSO ERM framework, the IIA Global Internal Audit Standards, and INTOSAI pronouncements, and the specific features of its application in the public sector are identified. The study demonstrates that periodic, calendar-based risk assessment can be further strengthened by incorporating continuously observable indicators, thereby enhancing the early detection of errors and irregularities. As a result, an integrated system of risk indicators is developed, serving both the early detection of financial errors and irregularities and the comprehensive assessment of risk levels in financial processes. The system covers five domains of budget operations, defines the calculation logic and threshold values for each indicator, and translates the aggregate score into an appropriate audit response.

Keywords: risk-based internal audit, risk indicators, early detection, budget organization, financial error, irregularity, continuous monitoring, threshold value, audit response, public financial management.

Аннотация. В статье обосновано применение риск-ориентированного подхода к внутреннему аудиту финансовых ошибок и несоответствий в бюджетных организациях. Концептуальные основы данного подхода исследованы на основе модели COSO ERM, Глобальных стандартов внутреннего аудита IIA и документов INTOSAI, а также выявлены особенности его применения в государственном секторе. В исследовании обосновано, что дополнение периодической оценки рисков, осуществляемой по календарному принципу, показателями, доступными для непрерывного наблюдения, способствует повышению эффективности раннего выявления ошибок и несоответствий. В результате разработана интегрированная система индикаторов риска, предназначенная как для раннего выявления финансовых ошибок и несоответствий, так и для комплексной оценки уровня риска в финансовых процессах. Система охватывает пять направлений бюджетных операций, определяет логику расчёта и пороговые значения каждого индикатора и преобразует совокупный балл в соответствующую аудиторскую реакцию.

Ключевые слова: риск-ориентированный внутренний аудит, индикаторы риска, раннее выявление, бюджетная организация, финансовая ошибка, несоответствие, непрерывный мониторинг, пороговое значение, аудиторская реакция, управление государственными финансами.

INTRODUCTION

The internal audit of budget organizations operates in an environment where audit resources need to be allocated carefully and efficiently. The volume of transactions processed by a public entity during a fiscal year is considerably greater than the volume that can be examined directly by an audit team, while internal audit is expected to identify material errors and irregularities before they affect the reliability of reporting or the legality of spending. These circumstances highlight the importance of allocating audit efforts in proportion to the level of risk.

The risk-based approach has therefore become one of the leading paradigms of modern internal auditing. Its practical implementation in the public sector requires a flexible and continuously updated assessment framework. Many budget organizations conduct risk assessments during the preparation of the annual audit plan and use the resulting scores throughout the following twelve months. At the same time, risk factors may change during the year: procurement volumes fluctuate, key personnel change, new spending programmes are introduced, and control procedures evolve. Therefore, supplementing annual assessments with more frequent monitoring can provide a more accurate reflection of the organization's current risk profile.

Another important consideration concerns the nature of the risk being assessed. In the corporate setting, risk is often expressed in monetary terms and evaluated through expected financial losses. In a budget organization, however, an irregularity involving a relatively modest amount may still have significant implications for compliance, accountability, and public confidence. Monetary magnitude should therefore be complemented by qualitative and compliance-related criteria when assessing risk in the public sector.

The purpose of this study is to substantiate the application of a risk-based approach to the internal audit of financial errors and irregularities in budget organizations and to develop a system of continuously observable risk indicators that enables early detection and comprehensive assessment of risk in financial processes.

LITERATURE REVIEW

The conceptual foundation of risk-based auditing is set out in the COSO Enterprise Risk Management framework, which treats risk assessment and monitoring as interconnected components of a continuous process rather than as separate annual exercises. The framework distinguishes inherent risk, control response, and residual risk and directs assurance efforts towards areas where residual risk requires increased management and audit attention.

The IIA Global Internal Audit Standards require the chief audit executive to develop an audit plan informed by an assessment of the organization's risks and to review and adjust that plan as circumstances change. The standards further require internal audit to consider both financial and non-financial risks and to communicate with senior management when the level of residual risk requires additional attention.

In the public sector, INTOSAI pronouncements provide the corresponding methodological basis. ISSAI 100 requires the auditor to determine materiality and direct attention towards areas of higher risk through a risk-based approach. The compliance auditing standards of the ISSAI 4000 series link risk assessment to the criteria against which the subject matter is evaluated, which is particularly relevant for budget organizations where compliance with legal and regulatory requirements represents an important assessment criterion alongside fair presentation.

ISA 315 (Revised) provides a detailed articulation of the risk identification process, requiring the auditor to obtain an understanding of the entity, its environment, and its internal control system and to identify risks at both the financial statement and assertion levels. Although formulated for external financial audits, this structure — understand, identify, assess, respond — can also be effectively adapted to internal audit work in the public sector.

A separate strand of the literature concerns continuous auditing and the use of key risk indicators. This literature emphasizes that assurance functions can be strengthened through repeatable, data-driven signals derived from transactional systems in addition to periodic professional judgement. Applying this approach to budget organizations requires indicators that can be computed from data already generated by treasury, payroll, procurement, and accounting systems without creating additional reporting burdens for the audited entity. Research specifically devoted to the design of such indicators for the budget sector of transition economies remains an area with considerable potential for further development, which forms the research gap addressed in this study.

RESEARCH METHODOLOGY

The study relies on a combination of qualitative methods. Comparative and content analysis were applied to international standards and national legal acts; logical generalisation was used to identify the specific features of risk-based auditing in the public sector; and structural modelling was employed to design the indicator system. Indicators were selected according to four criteria: computability from existing data, sensitivity to the phenomena being detected, robustness of the underlying information, and interpretability by auditors without requiring specialised statistical tools. Threshold values were established on the basis of expert judgement and are presented as reference values that may be calibrated to the specific characteristics of each organization. In addition, artificial intelligence tools were used as an auxiliary instrument for systematising the research materials and preparing the article text, accounting for no more than 10 percent of the overall work.

ANALYSIS AND RESULTS

The application of the risk-based approach in budget organizations has several specific features compared with its corporate application. First, the primary focus is not only on financial performance but also on the legality, purposefulness, and efficiency of spending; therefore, risk assessment should combine compliance criteria with financial indicators. Second, budget entities operate within a structured annual cycle in which certain periods — such as the end of the fiscal year, the approval of budget amendments, and major procurement rounds

— require increased audit attention. Third, the reputational and social consequences of irregularities may be significant even when their monetary value is relatively limited, which highlights the importance of combining quantitative and qualitative risk assessment criteria.

These features support the development of a system of indicators rather than reliance on a single composite score. Five indicator groups were identified, corresponding to the principal areas in which financial errors and irregularities may arise in budget organizations (Table 1).

Table 1.
Integrated System of Risk Indicators for the Internal Audit of Budget Organizations

Group	Indicator	Calculation logic	Reference threshold
I. Budget execution	Concentration of year-end spending	Share of Q4 expenditure in annual total	above 40%
I. Budget execution	Frequency of estimate amendments	Number of approved amendments per item	above 3 per year
II. Procurement	Share of non-competitive procedures	Value of direct contracts / total procurement	above 25%
II. Procurement	Contract value splitting signal	Number of contracts just below the threshold	above 2 per supplier
III. Payroll	Share of supplementary payments	Bonuses and allowances / base payroll	above 30%
III. Payroll	Deviation from the staffing schedule	Positions paid but not listed	any occurrence
IV. Assets	Inventory count coverage	Assets counted / assets on the register	below 90%
IV. Assets	Unregistered asset signal	Items found without accounting record	any occurrence
V. Accounting	Rate of manual corrections	Manual entries / total entries	above 5%
V. Accounting	Delay in primary documentation	Average days between event and entry	above 10 days

Source: developed by the author.

Each indicator is designed to be calculated on the basis of objective and verifiable data: the auditor extracts the relevant figures from the corresponding information system and applies the specified formula. This feature helps ensure consistency and comparability in risk assessment by reducing unnecessary variation in professional judgement at the calculation stage.

Each indicator is assigned a score of 0, 1, or 2 depending on whether its value is below the threshold, close to the threshold, or above it. Since the indicator groups differ in their relative importance for identifying potential financial errors and irregularities, the following weights were introduced: budget execution — 0.20; procurement — 0.30; payroll — 0.20; assets — 0.15; accounting — 0.15. The relatively higher weight assigned to procurement reflects both the concentration of financial risk in this area and the need for enhanced attention to compliance with procurement requirements.

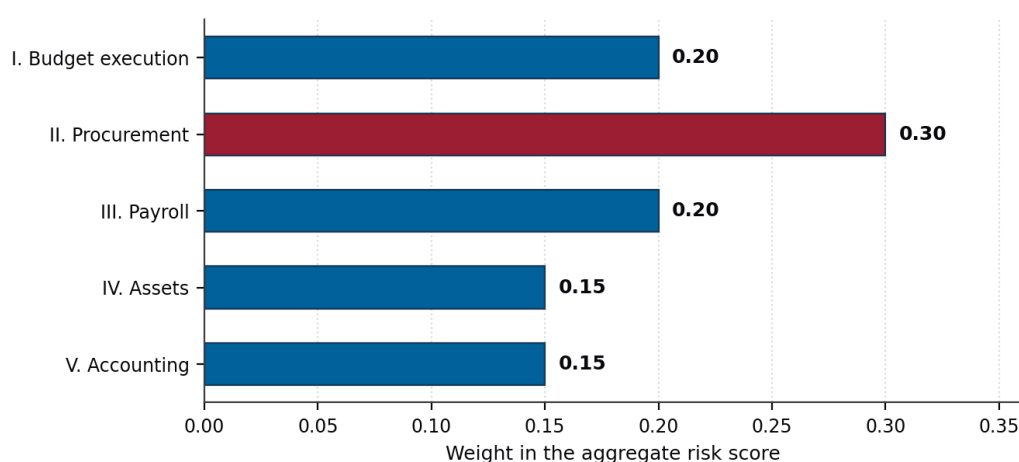


Figure 1. Weights of the Indicator Groups in the Aggregate Risk Score

Source: developed by the author.

The weighted aggregate score determines the risk level of the process and, correspondingly, the appropriate audit response (Table 2). An essential feature of the system is that the response is defined in advance: rather than relying solely on case-by-case judgement, the auditor follows a predetermined decision rule. This approach promotes greater consistency, transparency, and functional independence in the audit process.

Table 2.
Aggregate Risk Score and the Corresponding Audit Response

Weighted score	Risk level	Audit response
0.00–0.50	Low	Analytical review only; indicators monitored in the next period
0.51–1.00	Moderate	Targeted procedures on the affected group; sample of key transactions
1.01–1.50	Elevated	Full examination of the process; extended sample; interim reporting
1.51–2.00	High	Immediate engagement; escalation to the head of the organization and, where relevant, to the higher authority

Source: developed by the author.

Weighted risk score → audit response

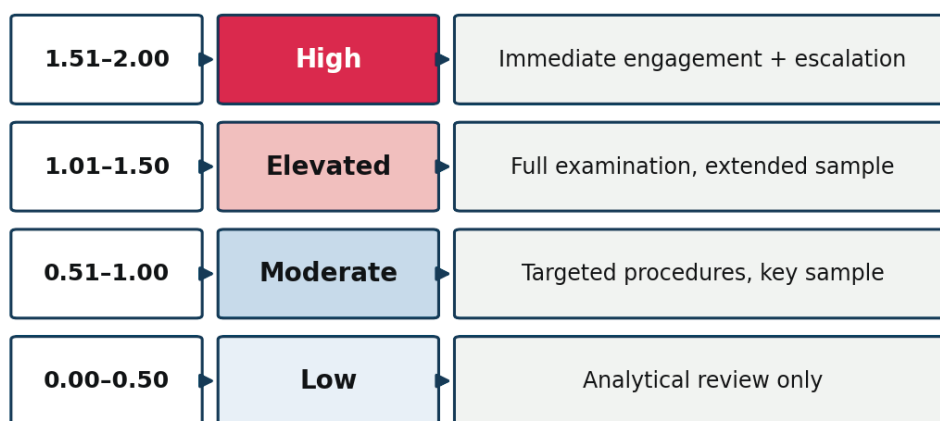


Figure 2. From the Weighted Risk Score to the Predetermined Audit Response

Source: developed by the author.

The integrated nature of the system lies in the fact that indicators are interpreted in combination rather than in isolation. A single elevated indicator may reflect a legitimate operational circumstance; however, a combination of elevated indicators across several groups may point to areas where internal controls require additional attention. For example, a high share of year-end spending combined with a high share of non-competitive procurement and delayed primary documentation may indicate a pattern of intensive year-end contracting, which can be more effectively assessed as an interconnected issue rather than as three separate observations.

The interpretation of indicator combinations can also be formalised. Three recurring patterns are proposed for practical use: the year-end contracting pattern (concentration of Q4 spending, non-competitive procurement, and delayed documentation); the payroll discretion pattern (a high share of supplementary payments combined with deviations from the staffing schedule); and the record-keeping pattern (a high rate of manual corrections combined with limited inventory count coverage). Each pattern highlights a particular area of internal control that may benefit from a tailored audit response.

The system also performs a preventive function. Because the indicators are calculated from data that already exist, they can be recalculated quarterly or monthly at relatively low additional cost. This enables risk assessment to evolve from a predominantly annual planning exercise into a continuous monitoring process, allowing the auditor to identify emerging issues during the fiscal year and support their timely correction before the accounts are closed.

The proposed system should be understood as a screening and early-warning tool rather than as a final judgement. An indicator exceeding its threshold does not in itself confirm that an error or irregularity has occurred; rather, it signals that the relevant area warrants additional audit attention. This distinction is institutionally important because it preserves the diagnostic and preventive role of the indicator system while supporting constructive interaction between auditors and management.

Threshold calibration represents an important practical stage in implementing the system. Thresholds that are too sensitive may generate more signals than the audit service can efficiently process, while overly broad thresholds may reduce the ability to identify emerging risks at an early stage. A balanced approach is therefore recommended: the reference values proposed above may be used initially, the outcome of each triggered signal should be recorded, and thresholds may subsequently be refined after two or three audit cycles on the basis of accumulated empirical evidence.

A further consideration relates to the behavioural effect of publishing the indicators. When managers are aware of the indicators being monitored, this can encourage stronger compliance and more disciplined financial management. To ensure that improvements are reflected not only in reported figures but also in actual operations, periodic verification of selected underlying transactions should complement indicator-based monitoring.

Implementation also depends on the availability and quality of data. Indicators relating to budget execution, payroll, and accounting can generally be calculated from information already available in treasury and accounting systems. Procurement indicators require access to contract registers, while asset indicators depend on the completeness and reliability of inventory records. Where data availability is limited, this may itself indicate an area where information systems and internal controls can be further strengthened.

The study is based on weights and thresholds derived from expert judgement, which provides an initial methodological foundation for practical application. The next stage of research should focus on testing the proposed system on a representative sample of budget organizations, empirically calibrating the weights and thresholds, and evaluating its predictive accuracy.

CONCLUSION AND SUGGESTIONS

First, the risk-based approach to the internal audit of budget organizations has several distinctive features compared with its corporate application. Risk assessment should place particular emphasis on compliance criteria, take into account predictable points of increased activity within the budget cycle, and consider reputational and social consequences alongside monetary values.

Second, annual risk assessment can be significantly strengthened by supplementing it with continuous or periodic monitoring throughout the year. Since the conditions that generate financial errors and irregularities may change over time, the use of regularly updated indicators can improve the timeliness and accuracy of risk identification.

Third, an integrated system of risk indicators covering budget execution, procurement, payroll, assets, and accounting was developed. The system converts routinely available data into a weighted risk score and links that score to a predetermined audit response, thereby supporting both the early identification of potential financial errors and irregularities and the comprehensive assessment of risk in financial processes. Future research should focus on the empirical calibration of thresholds and weights, as well as on integrating the system with the unified electronic registration of control activities.

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