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CLASSIFICATION OF LIGHT INDUSTRY CHARACTERISTICS AND SECTOR-SPECIFIC RISKS FOR INTERNAL AUDIT PURPOSES

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Abstract. This article systematises the specific characteristics of light industry production that affect internal auditing and examines the rapid growth of the sector using official statistical data. The principal result of the study is a four-group classification of industry-specific risks—supply, production and technological, financial and accounting, and sales and export risks—based on the stages of the production chain. The study also proposes an approach to assessing these risks using a probability–impact matrix. The proposed classification provides an industry-specific framework for risk-based internal audit planning and supports the identification of priority risks associated with inventories and production costs.

Keywords: light industry, industry characteristics, risk classification, risk assessment, probability–impact matrix, inventories, internal audit.

Аннотация. В статье систематизированы специфические особенности производства в лёгкой промышленности, оказывающие влияние на внутренний аудит, а также на основе официальных статистических данных проанализированы высокие темпы развития отрасли. Основным результатом исследования является классификация отраслевых рисков по четырём группам — риски снабжения, производственно-технологические, финансово-учётные, а также сбытовые и экспортные риски — в соответствии с этапами производственной цепочки. Кроме того, предложен подход к оценке данных рисков с использованием матрицы «вероятность–влияние». Предлагаемая классификация формирует отраслевую основу для риск-ориентированного планирования внутреннего аудита и способствует выявлению приоритетных рисков, связанных с запасами и производственными затратами.

Ключевые слова: лёгкая промышленность, отраслевые особенности, классификация рисков, оценка рисков, матрица «вероятность–влияние», запасы, внутренний аудит.

INTRODUCTION

The starting point of risk-based internal auditing is the identification of risks. To determine what should be audited, it is first necessary to establish systematically which threats may affect the enterprise. General risk lists that do not reflect the specific characteristics of the industry cannot adequately address this task: they may either fail to cover significant industry-specific risks or divert audit attention towards areas of secondary importance. Therefore, a classification of risks derived from sectoral characteristics and adapted to audit objectives constitutes a fundamental element of internal audit methodology.

This issue is particularly relevant to the light industry sector. Official statistics indicate that the sector has expanded rapidly. Between 2021 and 2024, textile production increased by more than 55 per cent in real terms, while clothing production grew by more than 51 per cent. By comparison, cumulative growth across the industrial sector as a whole amounted to approximately 30 per cent during the same period (National Statistics Committee, 2025). Rapid growth is accompanied by an expansion in the volume of business transactions, inventories and material flows, thereby increasing pressure on internal control systems and making the risk environment more complex.

The purpose of this study is to systematise the characteristics of light industry production that affect internal auditing and, on this basis, to develop an industry-specific risk classification for audit purposes. To achieve this purpose, the study addresses the following objectives: to examine the dynamics of industry development using official statistical data; to identify the principal characteristics of the sector and determine their implications for audit objects; to classify risks according to the logic of the production chain; and to integrate the proposed classification with a risk assessment approach based on a probability–impact matrix.

The object of the study is internal audit activity in light industry enterprises. The subject of the study is the relationship between industry characteristics, the risks arising from those characteristics, their classification

and the approach used for their assessment. In this study, the term “classification for audit purposes” does not refer merely to the general categorisation of risks. Rather, it denotes the grouping of risks in direct relation to the audit plan, audit objects and audit procedures. Accordingly, the classification is intended to answer the practical audit questions of what should be audited and in what sequence. This purpose-oriented approach distinguishes the proposed classification from general corporate risk registers and risk lists.

The logical framework of the study is based on the sequence “industry characteristic → risk → audit object → assessment”. First, the specific characteristics of the sector are identified. Second, the risks arising from these characteristics are determined. Third, the identified risks are linked to the relevant audit objects. Finally, the risks are assessed and prioritised. This sequence ensures the internal coherence of the research findings, since each risk group included in the classification arises from a specific industry characteristic and is associated with a clearly defined audit object. The subsequent sections of the article are structured in accordance with this logical sequence.

LITERATURE REVIEW

The general principles of risk classification are established in international risk management frameworks. The COSO Enterprise Risk Management framework links risks to organisational strategy and objectives (COSO, 2017), while ISO 31000 requires risk identification and classification to be derived from the specific internal and external context of an organisation (ISO, 2018).

From an auditing perspective, risk analysis is widely regarded as a fundamental basis for audit planning. Sawyer considers risk to be a principal criterion for the allocation of audit attention and resources (Sawyer et al., 2003). Pickett examines the development and practical application of risk registers and risk assessment procedures within internal audit functions (Pickett, 2010). Griffiths proposes an approach for linking audit workload and audit coverage to the results of risk assessment (Griffiths, 2005). The Global Internal Audit Standards further establish risk-based planning as a professional requirement for internal audit functions (The IIA, 2024).

The substantive origins of industry-specific risks, particularly those related to production processes and costs, are examined in the management accounting literature. Drury analyses cost flows, production losses and cost allocation issues in multi-stage production systems (Drury, 2012). Datar and Rajan systematise the application of standard costing and variance analysis in high-volume production environments (Datar and Rajan, 2018).

Relevant issues have also been examined in national academic literature. Akhmedjanov substantiated the need to improve internal audit methodology (Akhmedjanov, 2016). Ilhamov proposed criteria for evaluating the effectiveness of internal auditing (Ilhamov, 2019), while Khajimuratov examined the development of financial statement audit methodology (Khajimuratov, 2021).

The review of the literature indicates that existing risk classifications are generally developed either at the corporate level, using categories such as strategic, operational, financial and compliance risks, or in relation to a specific audit object, such as inventories. However, the academic literature does not provide a comprehensive classification based on the logic of the light industry production chain in which each risk group is directly linked to specific audit objects and relevant audit procedures. This study addresses this research gap and provides a theoretical foundation for the initial stage of a risk-based internal audit methodology for light industry enterprises.

RESEARCH METHODOLOGY

The study employed a combination of quantitative and qualitative research methods. Official statistical data analysis was used to examine the dynamics of the light industry sector based on the indicators “Industrial Production by Type of Economic Activity” and “Physical Volume Index” available in the open data system of the National Statistics Committee under indicator codes 1.02.01.0020 and 1.02.01.0022.

Systematic analysis and grouping methods were applied to identify and organise the principal characteristics of the sector and the risks arising from them. The classification method was used to group risks according to the stages of the production chain. A probability–impact matrix was proposed as a method for assessing and prioritising the identified risks. The use of official and verifiable statistical sources strengthens the reliability and reproducibility of the research findings.

ANALYSIS AND RESULTS

The analysis of industry dynamics provides empirical evidence of the increasing intensity and complexity of the risk environment in light industry enterprises. According to official data, the total production volume of three principal light industry activities—textile manufacturing (C13), manufacture

of wearing apparel (C14), and manufacture of leather and related products (C15)—increased from UZS 48.7 trillion in 2020 to UZS 125.5 trillion in 2024. During the same period, the combined share of these activities in total industrial production increased from 13.2 per cent to 14.3 per cent (National Statistics Committee, 2025).

The physical volume indices, which reflect changes in output after excluding the effect of price changes, demonstrate that the leading segments of light industry have consistently developed at higher rates than the industrial sector as a whole (Figure 1). These trends indicate not only quantitative expansion but also a corresponding increase in the number and complexity of production operations, material flows, inventory movements and related control procedures. Consequently, the rapid development of the sector creates additional demands on internal control systems and increases the significance of industry-specific risk identification and assessment.

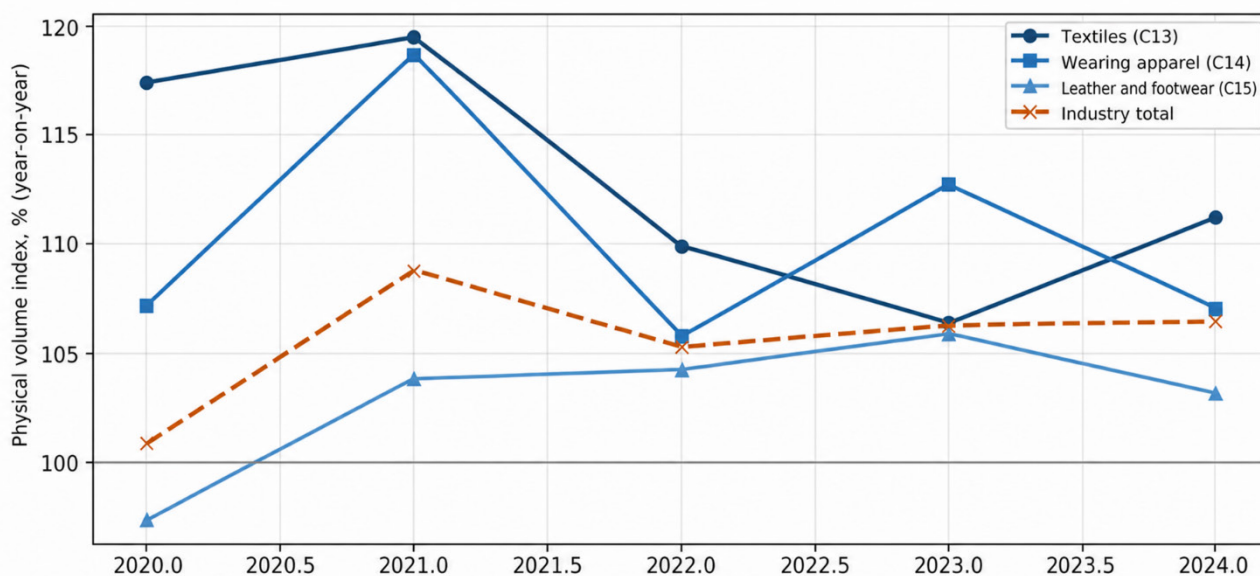


Figure 1. Physical Volume Indices of Production, Relative to the Previous Year (%)

Source: Compiled by the author based on open data from the National Statistics Committee of the Republic of Uzbekistan, indicator 1.02.01.0022, updated 18 June 2025.

The direct implication of rapid sectoral growth for internal auditing is that control systems may not develop at the same pace as business operations. As transaction volumes increase, the relative coverage provided by manual and sample-based controls tends to decline. At the same time, expanded production capacity and the involvement of new suppliers, customers and business partners may introduce additional and insufficiently assessed sources of risk. Accordingly, the rapid development of the industry strengthens the rationale for adopting a risk-based internal audit approach. Directing limited audit resources towards areas of greatest risk may contribute to maintaining the effectiveness of internal control.

A further advantage of the production-chain approach is that it reveals how risks may be transmitted across successive stages of operations. A risk originating at one stage may generate adverse effects at subsequent stages. For example, the procurement of low-quality raw materials, representing a supply risk, may increase waste and production losses and thereby create production and technological risks. These losses may subsequently distort product-cost calculations, resulting in costing risks, and may ultimately adversely affect product quality and market competitiveness, thereby generating sales risks. The proposed classification makes these interrelationships visible and helps internal auditors examine not only the consequences of risks but also their underlying causes. Accordingly, risk assessment should consider both the likelihood and impact of an individual risk and its potential to affect other stages of the production chain.

Since the structure of the risk landscape is determined by the specific characteristics of the sector, these characteristics should first be identified and systematised. From a technological perspective, light industry is characterised by high material intensity, with material costs representing a substantial share of total production costs; a multi-stage production process; and the technologically inherent generation of waste, scrap and production losses. From a market perspective, the sector is characterised by its dependence on

fashion cycles, frequent product-range renewal and export orientation. From an organisational perspective, it is distinguished by cluster-based integration and a substantial volume of intra-chain transactions and settlements. Each of these characteristics has a direct and identifiable effect on specific internal audit objects, as presented in Table 1.

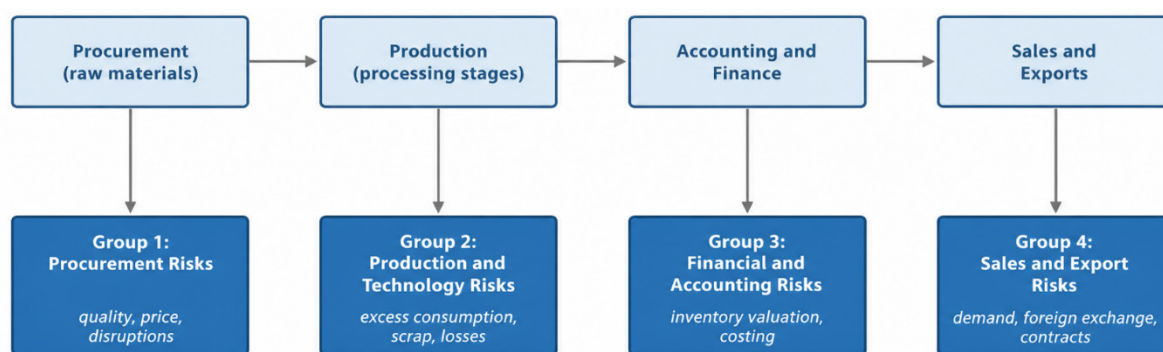
Table 1
Impact of Light Industry Characteristics on Internal Audit Objects

Industry characteristic	Description	Implications for internal audit objects
High material intensity	Material costs account for a substantial proportion of total production costs	Inventory movements, material consumption and compliance with established consumption standards
Multi-stage production chain	Successive spinning, weaving, dyeing and sewing processes	Allocation of costs between production stages and accounting for work in progress
Waste and production losses	Technologically inherent generation of waste, scrap and production losses	Verification of output and yield standards, and control over the classification, recording and movement of waste
Fashion cycle	Rapid obsolescence of product ranges and frequent assortment renewal	Assessment of inventory impairment and the adequacy of write-down allowances
Cluster integration	Settlements and transactions between participants in the production chain	Transfer pricing, related-party transactions and intra-cluster turnover
Export orientation	Foreign-currency revenue and the need to comply with contractual terms	Foreign-currency transactions, export settlements and compliance with export contracts

Source: Systematised by the author based on Drury (2012) and Datar and Rajan (2018).

The interaction among industry characteristics may create a more significant risk environment than the effect of each characteristic considered separately. When high material intensity is combined with dependence on fashion cycles, inventories are exposed to dual pressure: they represent a substantial share of invested capital while also being vulnerable to rapid obsolescence and impairment as seasonal demand changes. When a multi-stage production chain is combined with cluster-based integration, the allocation of costs and revenues extends beyond intra-enterprise transactions to inter-enterprise relationships, thereby increasing transfer-pricing and related-party transaction risks. Similarly, the combination of export orientation and short fashion cycles increases the importance of timely order fulfilment and strict compliance with contractual terms. Accordingly, the proposed approach is based on analysing the characteristics of the industry as an interconnected system rather than considering them in isolation.

The analysis of these characteristics provides a logical basis for determining the classification criterion. Since risks arise and are transmitted across successive stages of the production chain, the classification should reflect the structure of that chain. On this basis, a four-group classification of industry-specific risks is proposed: supply risks, including variations in the quality and prices of raw materials, supply disruptions and dependence on imported materials; production and technological risks, including excessive material consumption, increased waste and defects, inter-stage losses and equipment failures; financial and accounting risks, including incorrect inventory valuation, product-costing errors and distortions in accounting records; and sales and export risks, including changes in demand, fashion-cycle effects, foreign-exchange fluctuations and non-compliance with contractual terms. The structure of the proposed classification is presented in Figure 2.



Each group is linked to specific internal audit objects and procedures

Figure 2. Classification of Industry-Specific Risks into Four Groups Based on the Production Chain
Source: Developed by the author.

The proposed risk classification was evaluated against three methodological criteria: completeness, mutual exclusivity and practical applicability. Under the completeness criterion, the four risk groups cover the full production chain, from the acquisition of raw materials to the sale of finished products, thereby encompassing the principal industry-specific risks relevant to internal auditing. Under the mutual exclusivity criterion, each risk is assigned to a single group according to the stage at which it primarily arises, which helps prevent duplication and double counting during the assessment process. Under the practical applicability criterion, the number of groups remains manageable, while each group corresponds to audit objects that are familiar and readily identifiable in internal audit practice. Compliance with these criteria transforms the classification from a purely theoretical framework into an operational audit tool.

A key feature of the classification is the direct association of each risk group with specific audit objects. Accordingly, the classification does not function merely as a conceptual list of risks, but as a practical basis for preparing the audit plan. The composition of the risk groups and their corresponding audit objects is summarised in Table 2. By selecting a particular risk group, the auditor can immediately identify the relevant documents, accounting areas, business processes and audit procedures that require examination. This sequence of “risk → audit object → audit procedure” enables the proposed classification to operate as an integral component of a risk-based internal audit methodology.

Table 2

Composition of Industry-Specific Risk Groups and Corresponding Internal Audit Objects

Risk group	Principal risks	Internal audit objects
1. Supply risks	Variations in the quality and prices of raw materials, supply disruptions and dependence on imports	Procurement contracts, incoming quality control and supplier evaluation
2. Production and technological risks	Excessive material consumption, cost overruns, inter-stage production losses and equipment failure	Material consumption standards, material balances, production cost accounting and work in progress
3. Financial and accounting risks	Misvaluation of inventories, errors in product costing and accounting irregularities	Inventory valuation, product cost calculations and inventory records
4. Sales and export risks	Changes in demand and fashion trends, foreign-exchange fluctuations and non-compliance with contractual terms	Finished-goods inventories, export documentation, foreign-currency transactions and compliance with sales and export contracts

Source: Developed by the author.

A probability–impact matrix is proposed for prioritising the classified risks. Each risk is assessed on a five-point scale according to its likelihood of occurrence and potential impact and is then positioned within a 5 × 5 matrix. The product of the likelihood and impact scores determines whether the risk is classified as critical, high, medium or low. The assessment should be conducted with the participation

of representatives from the production, procurement, accounting and sales departments and should be based on the enterprise's own operational data. An assessment reflecting the specific conditions of the enterprise, rather than relying on an externally developed generic scorecard, enhances the practical value of the proposed classification.

Formal documentation of the risk assessment procedure ensures the consistency and reproducibility of the results. The likelihood scale should be defined in terms of the expected frequency of an event, ranging from very unlikely to almost certain, while the impact scale should reflect the potential financial consequences and effects on business operations. Each level should be accompanied by a clear qualitative description so that different assessors interpret the scoring criteria consistently. The assessment results should be recorded in a risk register specifying the relevant risk group, likelihood and impact scores, overall risk level and responsible person or department. The assessment should be updated at least annually and immediately following any significant change in operating conditions, thereby ensuring that the risk register and matrix remain current.

To improve the objectivity of the assessment, a two-source approach is recommended. Risk estimates provided by operational departments should be compared with independent evidence obtained by the internal audit function, including the findings of previous audits, analytical procedures and statistics on deviations and control failures. Where the assessments derived from both sources are consistent, confidence in the resulting risk rating increases. A significant divergence between them is itself an important diagnostic signal, as it may indicate either that the responsible department has underestimated the risk or that the information available to internal audit is outdated. In either case, further investigation is required. The risk assessment process therefore serves not only as a ranking mechanism but also as a diagnostic tool for evaluating the quality of the control environment.

Based on the qualitative characteristics of the industry, critical and high risks are likely to be concentrated primarily within the first and second groups, particularly in relation to inventory movements and the formation of production costs. The high material intensity of light industry means that even relatively small irregularities in material flows may have substantial financial consequences, while the multi-stage production chain increases the number of points at which losses, distortions and control failures may occur. Risks in the third group are closely connected with the first two groups because supply and production irregularities are ultimately reflected in inventory valuation and product costing. Risks in the fourth group may also have a significant impact, although many of them are influenced partly by external market factors. This risk profile supports the prioritisation of inventory and production-cost audits within the internal audit plan.

The central role of inventories is also evident from the internal structure of the classification, since inventories represent the point at which at least three risk groups intersect. Supply risks are reflected in the quality and initial valuation of raw materials; production and technological risks arise through their consumption, transformation and movement; and financial and accounting risks are manifested in their measurement, recognition and recording. Inventory auditing therefore constitutes an integrated examination covering several risk groups simultaneously. This feature gives inventory-related audit engagements a distinct priority within the audit plan and requires the integrated application of material-balance analysis, production-cost analysis and impairment-assessment procedures.

The scientific novelty of the study is reflected in three principal contributions. First, the characteristics of light industry have been comprehensively systematised according to their effects on internal audit objects. Second, a four-group classification of industry-specific risks has been developed on the basis of the stages of the production chain, with each risk group linked directly to specific audit objects. Third, the classification has been integrated with a probability–impact assessment matrix and transformed into a practical instrument for risk-based audit planning. Unlike general corporate risk classifications presented in the COSO and ISO frameworks (COSO, 2017; ISO, 2018), the proposed model is linked directly to the light industry production chain and adapted to internal audit objectives. It also supplements the approach proposed by Griffiths (2005) by providing industry-specific content for the risk-identification stage.

The proposed classification is also relevant to national audit practice because it may serve as a common methodological framework at the level of industry associations. Where enterprises apply a standardised risk grouping, it becomes possible to consolidate the industry-wide risk profile, conduct inter-enterprise comparisons and issue common risk alerts. Within cluster-based structures, a unified classification facilitates the continuous exchange of risk information among participants in the production chain. For example, a supply risk identified at an earlier stage of the chain may immediately provide a basis for additional audit procedures at subsequent stages. The classification may also provide a basis for developing a shared industry-level framework for risk identification and comparison.

The classification can also be integrated with digital monitoring tools. Where a dashboard of key risk indicators is structured according to the four risk groups, the current condition of each area can be monitored in a

clear and systematic manner. Supply risks may be monitored through indicators of raw-material quality, delivery timeliness and procurement prices; production and technological risks through material-consumption, waste and cost-overrun indicators; financial and accounting risks through inventory turnover, valuation adjustments and costing deviations; and sales and export risks through finished-goods balances, order fulfilment, export receivables and foreign-exchange exposure. In this way, the classification may provide a structural basis for an automated risk-monitoring system and support the transition from periodic risk assessment to continuous risk monitoring.

The study is subject to several limitations. The scores used in the probability–impact matrix are based partly on expert judgement and may therefore vary across enterprises. The generalised risk profile developed in the study is qualitative, while the assessment of an individual enterprise must be based on its own operational and financial data. In addition, the proposed classification should be regarded as an open system. As digitalisation progresses, risks related to information systems, cybersecurity and data integrity may be developed as separate subgroups. The production-chain logic does not restrict such development; rather, it provides a coherent framework within which additional risk categories may be incorporated.

The classification may be incorporated into the annual audit-planning process in the following manner. Each risk recorded in the risk register is included within the audit scope according to its position in the probability–impact matrix. Critical risks should be subject to mandatory and in-depth audit coverage within the annual plan. High risks should also be included on a mandatory basis, although the scope and depth of procedures may be determined according to the nature of the risk. Medium risks may be addressed through a rolling audit programme, while low risks may remain under monitoring unless their likelihood or impact increases. The results of risk assessment are therefore translated directly into the structure of the internal audit plan, and each planned engagement is supported by a documented explanation of why it has been selected. Such traceability strengthens the justification of the audit plan and enhances the accountability of the internal audit function to the supervisory board or audit committee.

The choice of a probability–impact matrix also has a clear methodological basis, as it provides an appropriate balance between qualitative and quantitative assessment approaches. Fully quantitative methods, including statistical modelling, require sufficiently large, reliable and historically consistent datasets, which have not yet been established in many enterprises. Purely qualitative risk lists, by contrast, do not provide an adequate basis for systematic prioritisation. A five-point, two-dimensional matrix uses expert knowledge while converting individual assessments into comparable risk levels. It is relatively simple to apply and can be understood by representatives of all functional departments. As enterprise databases become more comprehensive, matrix scores may be supplemented and calibrated using quantitative key risk indicators, allowing the assessment framework to develop progressively.

CONCLUSIONS AND RECOMMENDATIONS

The study systematised the characteristics of light industry production that affect internal auditing and developed a four-group classification of industry-specific risks based on the stages of the production chain. Official statistical data indicate that the real growth rate of the principal light industry segments has been substantially higher than the average growth rate of industry as a whole. This trend provides empirical evidence of the increasing complexity of the sector's risk environment and reinforces the need for risk-based internal auditing. By linking each risk group to specific audit objects and incorporating a probability–impact matrix for prioritisation, the proposed classification provides an industry-specific instrument for developing the internal audit plan.

For practical implementation, light industry enterprises should maintain a risk register based on the proposed four-group classification and conduct an annual risk assessment using a probability–impact matrix with the participation of the relevant functional departments. Inventory and production-cost audits should be assigned priority within the annual internal audit plan because these areas represent the intersection of several major risk groups. The classification and related assessment procedures should also be incorporated into internal audit regulations, methodological guidelines and working documents. Future research should test the proposed classification across a representative sample of light industry enterprises and empirically determine benchmark values for key risk indicators within each risk group.

The significance of the results is evident at three levels. At the enterprise level, the classification and assessment matrix provide the initial and foundational stage of a risk-based internal audit methodology. At the industry level, a unified classification creates opportunities for inter-enterprise comparison, consolidation of sector-wide risk information and the exchange of risk signals within cluster structures. At the educational level, the application of a clearly structured classification to a specific industry adds practical content to the study of risk identification within internal audit courses. Taken together with the conceptual, methodological and

organisational approaches developed in related studies, the results contribute to the formation of an integrated framework for improving internal audit in light industry enterprises.

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