

Quantitative Research on Enterprise Internal Audit Based on Risk Orientation

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Keywords: Risk orientation, Internal audit, Quantitative analysis

Abstract: At first, risk-oriented audit was mainly applied to social audit. Applying the risk-oriented concept and technology to the internal audit of enterprises will play an important role in enterprise management and development, and inject new vitality into modern enterprise management. As a new, multi-dimensional and brand-new audit mode, risk-oriented internal audit has a better understanding of enterprises than system-based audit mode, and should be widely used. In today's increasingly complex business environment, the traditional internal audit can no longer meet the needs of enterprise development. Faced with all kinds of risks that may have potential or actual impact on enterprises at any time, it is of great significance to advocate and implement risk-oriented internal audit in internal audit work. Firstly, this paper briefly introduces the risk-oriented internal audit, then puts forward a risk-oriented internal audit risk prediction model, and verifies the effectiveness of this model through data analysis.

1. Introduction

With the vigorous growth of market economy, the competitive situation and business environment faced by enterprises are becoming increasingly fierce and complex. With the rapid growth of modern society and economy, all kinds of new things emerge one after another, and new business models come into being. Internal audit is the inevitable outcome of the growth of enterprises to a certain stage[1]. It is gradually developed based on the needs of modern social and economic development, and it is an important tool to improve the management level of enterprises. Due to the existence of various uncertain factors, enterprises are facing more and more competitive pressure, more and more problems and accounts in enterprises, and more and more heavy audit business. Modern society has ushered in the audit era of risk-oriented and control-oriented[2]. If only the system-based audit is adopted, that is, only the reliability of internal control is used to reduce the substantive test, it is far from guaranteeing the internal audit quality of enterprises[3]. Modern risk-oriented internal audit not only attaches importance to the analysis of internal control and the examination of accounting statements, account books and vouchers, but also attaches importance to the effectiveness of risk management mechanism and the perfection of corporate governance structure[4]. In view of the need of strengthening risk management, it has become an urgent problem for the internal audit department of an enterprise to change the audit method from the traditional compliance audit to the risk-oriented audit aiming at strengthening and improving organizational risk management[5].

Under the background of global economic integration, the growth of enterprises is faced with more unpredictable factors, and the competitive pressure is also increasing. As a new, multi-dimensional and brand-new audit mode, risk-oriented internal audit has a better understanding of enterprises than system-based audit mode, and should be widely used. With the growth of the world economy, internal audit has gradually become an indispensable means to improve corporate governance, and the risk-oriented internal audit model is the inevitable requirement of the growth of internal audit[6]. As a modern audit method, risk-oriented internal audit plays a vital role in corporate governance. The modern internal audit mode is risk-oriented, carries out risk

identification and risk assessment as a whole, feeds back and controls risks, provides consulting services to enterprises to add value, pays more attention to the effect of corporate governance, improves the working efficiency of internal audit, and is conducive to the realization of strategic objectives of enterprises[7]. Firstly, this paper briefly introduces the risk-oriented internal audit, then puts forward a risk-oriented internal audit risk prediction model, and verifies the effectiveness of this model through data analysis.

2. Risk Analysis of Enterprise Internal Audit

Risk-oriented internal audit means that internal auditors take risk analysis and risk assessment as the guidance in the stage of conducting internal audit activities of enterprises, analyze the overall economic business of enterprises, determine the key points of relevant audit projects according to the quantitative analysis level, sort the projects that may cause significant risks, and give priority to audit according to the significant degree. The risk management level of enterprises is different with different scale and business. How to properly identify and analyze the risks of enterprises is the key of model design. Enterprises must pay close attention to risk factors in strategic objectives, major investment decisions, daily business activities and performance evaluation. Therefore, it is necessary for enterprises to introduce the risk-oriented internal audit mode, both from the self-development needs of internal audit and from the perspective of helping enterprises survive in the complex competitive environment.

Internal audit pays attention to corporate governance, and corporate governance is changing from the static command control mode to the adaptation to changing business risks. Therefore, internal audit needs to pay more attention to risk management and the future business prospects of the organization. With the growth of the world economy, the internal audit of enterprises has gradually become an indispensable part of governance activities, from providing confirmation and evaluation activities for the organization's business activities to providing consulting services for the company's management and control, providing a relatively stable internal control environment, which is conducive to the realization of the enterprise development strategy[8]. As a new type of audit mode, risk-oriented internal audit refers to internal auditors' screening of risk points in the whole stage of internal audit according to the internal and external environment of the enterprise, taking a series of risks faced by the enterprise in the stage of production and operation as the guide, and combining the business process and the concentration degree of business volume, so as to carry out project audit in high-risk areas, thereby narrowing the audit scope and reducing the audit risk.

The amount of internal audit information is inversely proportional to the frequency of information, and the amount of information contained in different information can be accumulated. Set sample set:

$$S = \{s_1, s_2, \dots, s_m\} \quad (1)$$

Sample categories are:

$$C = \{c_1, c_2, \dots, c_k\} \quad (2)$$

The calculation formula of the sample information entropy is as follows:

$$\begin{aligned} H(S) &= \sum_{j=1}^k \sum_{i=1}^m p(s_{ij}) \log \frac{1}{p(s_{ij})} \\ &= - \sum_{j=1}^k \sum_{i=1}^m p(s_{ij}) \log p(s_{ij}) \end{aligned} \quad (3)$$

Where $p(s_{ij})$ represents the probability that the sample points in this sample set belong to category c_j . Set sample attribute set:

$$A = \{a_1, a_2, \dots, a_t\}^T \quad (4)$$

With t different values. According to the attribute A , the sample set is divided into t sample subsets. At this time, the information entropy of the sample set is as follows:

$$H(S|A) = -\sum_{j=1}^k \sum_{i=1}^t p(a_{ij}) \log p(a_{ij}) \quad (5)$$

Where $p(a_{ij})$ represents the probability that the sample points belong to category c_i when the attribute A is a_i .

By comprehensively considering all kinds of influencing factors, we can effectively identify and evaluate all kinds of risks faced by enterprises, put forward constructive opinions to the management, inform the actual and potential risks faced by enterprises in advance, and form an early warning mechanism to provide paths and ideas for enterprises to avoid all kinds of adverse risks.

3. Evaluation of Enterprise Internal Audit Risk Model

The internal audit growth of enterprises is not balanced enough, including the imbalance between higher and lower levels and the imbalance between regions. The specific implementation of internal audit is to let internal auditors find the problems existing in the daily operation and management of enterprises. Only when the organization, personnel and economic interests are independent, can the internal auditors carry out audit supervision activities according to law, and the final audit effect can be guaranteed to the greatest extent. Risk-oriented internal audit, as an early-warning real-time and dynamic monitoring audit mode, puts forward higher information requirements for enterprises. It is necessary to make the limited internal audit resources of enterprises within a limited time and space range to optimize the combination and allocation of internal audit resources, which requires enterprises to promote the integration and coordination of internal audit systems. Compare the output data of the audit risk model with the real financial sharing data, as shown in Table 1.

Table 1 Audit Risk Model Learning Results

	Prediction value	Actual value
40	0.8	0.812
80	0.83	0.842
120	0.727	0.741
160	0.723	0.715
200	0.741	0.753
240	0.862	0.874
280	0.83	0.844
320	0.864	0.856
360	0.822	0.834
400	0.855	0.869
440	0.821	0.833
480	0.791	0.783
520	0.831	0.843
560	0.791	0.803
600	0.752	0.744

It is not difficult to see that the learning result of the proposed audit risk model is convergent, which can approximate the original data very well, and has the basis for forecasting the future data.

Risk-oriented audit mode requires the use of analytical testing procedures as an important means to obtain audit evidence. The analytical test procedure is based on the extensive application of mathematical statistics, and when the acceptable risk level is estimated according to the statistics, there should be audit evidence of corresponding scale. Because the internal control of information system and enterprise business is relatively weak, and the corresponding laws and regulations are lagging behind, it is easy to become a new risk point. Therefore, we should use early warning

software to analyze through data link, find potential risks in time, and take quick measures to eliminate them, so as to promote the healthy and stable operation of enterprises. The audit risk evaluation results and expert evaluation results trained by this model are shown in Table 2. It can be seen that the evaluation results of training samples are in good agreement with those of experts.

Table 2 Expert Evaluation Results and Model Evaluation Results

Sample number	Expert appraisal	Evaluation of this model
1	0.95	0.952
2	0.81	0.813
3	0.83	0.833
4	0.74	0.738
5	0.79	0.788
6	0.71	0.715
7	0.82	0.824
8	0.67	0.672
9	0.65	0.653
10	0.78	0.781

Input the five groups of test data prepared in advance into the trained neural network model, and the simulation results and expert evaluation results are shown in Table 3. It is not difficult to see that the simulation results are in good agreement with the evaluation results given by experts.

Table 3 Simulation Evaluation Results and Expert Evaluation Results

Sample number	Expert appraisal	Evaluation of this model
1	0.68	0.681
2	0.62	0.631
3	0.74	0.745
4	0.66	0.661
5	0.75	0.75
6	0.81	0.813

Through the comparison between Table 2 and Table 3, it is found that the audit risk model in this paper not only has the training and prediction accuracy within the acceptable range, but also the error of the test sample is close to that of the test sample. In order to innovate the financial management of enterprises, we should first start from the top level to the grass-roots level, attach importance to the cultivation of data thinking and firmly establish data thinking. Under the risk-oriented internal audit mode, internal auditors should spend more time and energy communicating with management and decision makers, and fully understand the audit domain and related risk factors in the stage of implementing the business objectives of the audited entity. In terms of audit independence, internal audit is restricted by enterprises in terms of organization and economic benefits.

With the fierce competition in modern society, the quality and awareness of leaders directly affect the development prospects of enterprises. To make the enterprise's internal audit really play its due role, leaders must pay enough attention to it. The attention of enterprise leaders to internal audit is the key to the long-term growth of enterprises. Therefore, leaders of many enterprises need to change their thinking and improve their awareness of the importance of internal audit. The application of risk-oriented internal audit should identify and evaluate the risks of the whole organization, take the strategic objectives of the company as the starting point and take appropriate risk response measures.

4. Conclusions

To accomplish the internal audit objectives, auditors are required to have excellent professional qualities, be able to make a correct assessment of the business decisions of enterprises, and adopt appropriate audit procedures in the stage of assessment and decision-making. In the stage of

working practice, internal auditors should constantly accumulate professional knowledge, improve their professional quality by participating in professional skills training, and learn modern auditing theories and methods. Firstly, this paper briefly introduces the risk-oriented internal audit, then puts forward a risk-oriented internal audit risk prediction model, and verifies the effectiveness of this model through data analysis. The analysis shows that the audit risk model not only has an acceptable training and prediction accuracy, but also the error of the test sample is close to that of the test sample. Under the risk-oriented internal audit mode, internal auditors should spend more time and energy communicating with management and decision makers, and fully understand the audit domain and related risk factors in the stage of implementing the business objectives of the audited entity. Through the collection, classification, monitoring and analysis of risk data, we will actively build a risk data and index system, continuously implement differentiated classified supervision and audit, and enhance the comprehensiveness, scientificity, pertinence and effectiveness of internal audit.

References

- [1] Zhou G. Research on the problems of enterprise internal audit under the background of artificial intelligence[J]. *Journal of Physics Conference Series*, 2021, 1861(1):012051.
- [2] Bailey, Cristina, Collins, et al. The Impact of Enterprise Risk Management on the Audit Process: Evidence from Audit Fees and Audit Delay[J]. *Auditing*, 2018, 37(3):25-46.
- [3] Vitomir J, Laban B, Popovi D, et al. Importance of implementation of decision making flow by internal audit to top management of agricultural enterprise in Republic of Serbia[J]. *Poljoprivredna Tehnika*, 2020, 45(2):1-7.
- [4] Mustafa F M, Nimer M. The association between enterprise risk management and corporate governance quality: The mediating role of internal audit performance[J]. *Journal of Advanced Research in Law and Economics*, 2018, 9(4):1387-1401.
- [5] Liu Qingsong, Zhang Xiaoyou. Analysis of the integration and growth of big data and enterprise internal audit [J]. *Enterprise Economy*, 2019, 38(12):7.
- [6] Le Mengxi. On the necessity and challenges of informatization construction of internal audit in enterprises [J]. *Economics*, 2022, 4(6):62-63.
- [7] Liu Chunli. Analysis of the application of big data technology in the internal audit of railway enterprises [J]. *Railway transport and economy*, 2022, 44(5):6.
- [8] Yi Liao. Analysis of the construction of long-term mechanism for internal audit and rectification of railway enterprises [J]. *Railway transport and economy*, 2020, 42(7):5.