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RESEARCH ON THE EVALUATION METHOD OF ENTERPRISE LEGAL RISK

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ABSTRACT

Purpose: Legal act is frequent in daily management of the legal behavior. Enterprises are facing all kinds of legal issues in all kinds of business activities, enterprises in the business, the process of the contract, shall be strictly in accordance with the contract rights and obligations to fulfill, but due to the enterprise internal and external some uncertain factors, these may lead to business and business contract cannot smooth realization factors, Enterprises may be involved in disputes, losses, thus forming risks.

Theoretical framework: After analyzing the factors that cause enterprise legal risk, this paper carries on the scientific classification and the characteristic boundary to enterprise legal risk.

Design/methodology/approach: This paper analyzes the system level of enterprise legal risk, uses the method of hierarchy comprehensive evaluation, studies the ideas and evaluation objectives of the evaluation system of enterprise legal risk.

Findings: The results of the study, the paper establishes the evaluation model of the enterprise legal risk, and gives a set of the evaluation system of the enterprise legal risk.

Research, Practical & Social implications: The study can reduce enterprise disputes and losses, thus reducing legal risks.

Originality/value: The value of the study realizes that the legal risk management measures of enterprises can be scientific, systematic and practical, and play a greater role in practice.

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PESQUISA SOBRE O MÉTODO DE AVALIAÇÃO DE RISCO LEGAL EMPRESARIAL

RESUMO

Finalidade: O ato jurídico é frequente na gestão diária do comportamento jurídico. As empresas estão enfrentando todos os tipos de questões legais em todos os tipos de atividades comerciais, as empresas no negócio, o processo do contrato, devem estar estritamente de acordo com os direitos e obrigações do contrato a cumprir, mas devido à empresa interna e externa, algumas incertezas fatores, estes podem levar a negócios e contratos de negócios não podem suavizar os fatores de realização, as empresas podem estar envolvidas em disputas, perdas, formando riscos.
Referencial teórico: Após a análise dos fatores causadores do risco jurídico empresarial, este trabalho procede à classificação científica e ao limite característico do risco jurídico empresarial.
Desenho/metodologia/abordagem: Este artigo analisa o nível do sistema de risco legal empresarial, utiliza o método de avaliação abrangente hierárquica, estuda as ideias e os objetivos de avaliação do sistema de avaliação de risco legal empresarial.
Resultados: Os resultados do estudo, o documento estabelece o modelo de avaliação do risco legal empresarial e fornece um conjunto do sistema de avaliação do risco legal empresarial.
Pesquisa, implicações práticas e sociais: O estudo pode reduzir disputas e perdas empresariais, reduzindo assim os riscos legais.
Originalidade/valor: O valor do estudo percebe que as medidas de gerenciamento de risco legal das empresas podem ser científicas, sistemáticas e práticas, e desempenhar um papel maior na prática.

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Palavras-chave: Gestão Empresarial, Risco Legal, Avaliação Integral da Hierarquia.

INVESTIGACIÓN SOBRE EL MÉTODO DE EVALUACIÓN DEL RIESGO JURÍDICO EMPRESARIAL

RESUMEN
Finalidad: El acto jurídico es frecuente en la gestión diaria de la conducta jurídica. Las empresas se enfrentan a todo tipo de problemas legales en todo tipo de actividades comerciales, las empresas en el negocio, el proceso del contrato, deberá cumplir estrictamente con los derechos y obligaciones del contrato, pero debido a la empresa interna y externa algunos inciertos factores, estos pueden conducir a los negocios y el contrato comercial no puede suavizar los factores de realización, las empresas pueden estar involucradas en disputas, pérdidas, formando así riesgos.
Marco teórico: Después de analizar los factores que provocan el riesgo jurídico empresarial, este trabajo continúa con la clasificación científica y la delimitación característica del riesgo jurídico empresarial.
Diseño/metodología/enfoque: Este documento analiza el nivel del sistema de riesgo legal empresarial, utiliza el método de evaluación integral jerárquica, estudia las ideas y los objetivos de evaluación del sistema de evaluación de riesgo legal empresarial.
Conclusiones: los resultados del estudio, el documento establece el modelo de evaluación del riesgo legal empresarial y proporciona un conjunto del sistema de evaluación del riesgo legal empresarial.
Investigación, implicaciones prácticas y sociales: el estudio puede reducir las disputas y pérdidas empresariales, reduciendo así los riesgos legales.
Originalidad/valor: El valor del estudio da cuenta de que las medidas legales de gestión de riesgos de las empresas pueden ser científicas, sistemáticas y prácticas, y desempeñar un papel más importante en la práctica.

Palabra clave: Gestión Empresarial, Riesgo Legal, Evaluación Integral de Jerarquía.

INTRODUCTION

The important factor in stimulating economic growth and elevating people's standards of living is the financial sector's healthy development. It has brought tremendous advancements to competitive pressures, employment creation, and taxation, however, assessing and mitigating credit and liquidity risk should be done by the financial institutions and concerned government agencies(Yan and Song, 2022). Fundamental legal compliance shields against legal wrongdoing but sophisticated programs cover grounds like staff morale, client happiness, and public perception. The current trends of ethical awareness, corporate sustainability social responsibility, and public support are all infused with compliance management The quality of the legal system is advantageous to prevent government intrusion, shielding investments, and enabling banks and other financial institutions with the assurance that their financial and investment plans would really be established in line with corporate planning and design (**Husam**, 2023). Moreover, Capital formation, and the percentage of banks who venture to offer more intermediate loan facilities liquidity all increase with increasing levels of administration of justice (Zhao,2016).Knowledge on the financial risks of financial institutions exhibits intricacy, uniqueness, and variability due to the accelerated economic growth trajectory of large financial data. In the background of rapid economic development, the modern

enterprises will face more opportunities and challenges. Market competition does not only bring development opportunities to enterprises, but also brings increasing risks(Jing, 2008). These risks can be divided into natural risks, sales risks, investment risks, financial risks and legal risks, etc. Commercial risks are random and changeable (Guiyou and Yue, 2011) and unpredictable and uncontrollable, while the legal risks can be controlled. If the legal risks are not properly treated, they will bring some serious consequences to the enterprises management (Jian, 2012). The primary cause of the financial risk of banking sector is the selection of a deposit-loan maturities discrepancy, which is a powerful instrument for a weak independent legal safety mechanism or an exorbitant cost of contractual execution (Suhartono, et al, 2023). A comprehensive risk management policy should contain tactics for understanding and fixing the dangers and hazards that the business confronts, as well as potential solutions (Khan and Kothari, 2020).

BACKGROUND

Risks are associated in all aspects of human life and have the potential to adversely affect each individual, community and stakeholders. In the past few years, both academia and enterprise have acknowledged risk mitigation and management as crucial instruments for controlling and managing risks. There are procedures for discovering, evaluating, managing, and keeping track of risks in order to lessen the degree of uncertainty in investors' decisions. Tradition risks evaluations center on risks that arise from legal or physical sources, like as catastrophes or natural calamities, accidents, homicides, and lawsuits.

Other forms have emerged, such as enterprise risk management, that offers a mechanism to maximize the value of the processes from a methodical perspective, and investment policies, which focuses on risks that could be managed by using traded financial derivatives(Wu, Chen, and Olson, 2014). At present, most of the management and control of enterprises' risks lack practical feasibility and generally remain on the surface of legal documents, which is not efficient in practical application. The reason is that when enterprises carry out the risk control and study the management measures of corresponding event(Yue, 2012). By surveying 278 manufacturing companies in the United States from 2005 to 2014, it was analyzed how business information systems affected the profitability of a business and associated risks. It was found that BI system supported to increase businesses' profitability and risks to profitability returns were immediately reduced (Yiu, Yeung and Cheng, 2021).Luthra and Mangla (2018) used the AHP technique to assess and analyze corporate, technical, legal, strategic and ethical

sustainability issues associated with. They discovered that the application of the 14.0 technology is significantly hampered by enterprise management problems (Luthra and Mangla, 2018). There is no support from legal theory and legal technology. Therefore, the accurate evaluation of enterprise legal risks can promote the establishment and improvement of a series of systems (Bo, 2014). This can promote enterprises to take timely and positive measures to minimize the loss caused by risks and save operating costs, so that enterprises can make steady progress in the economic battlefield full of crises (Karpoff, Lott and Wehrly, 2005).

Objective of the research problem: Such as this research on the risk evaluation will greatly improve the safety management status of enterprise, make the enterprise's safety management to have laws to follow, and make the enterprise's measures of legal risk management to be scientific, systematic and practical in order to play a greater role in practice.

THEORETICAL REFERENCE FRAMWEORK

In business activities, enterprises may cause the different legal risks due to the interference of different factors, as shown in Table1.

Table 1. Classification of Corporate Legal Risks

varieties	Definitions
directness	Due to legal factors or lack of legal support in operation and management(Xiao and Liao, 2012)
indirectness	After the occurrence of non-legal risk, it brings various legal consequences to enterprises
objectivity	Objective events transferred by non-human consciousness (Khan and Kothari, 2020).
subjectivity	Objective events diverted by one's consciousness
behaviour	Legal consequences caused by the initiative implementation of certain behaviors (Wu, Chen, and Olson, 2014)
negative act	The enterprise does not take necessary or required action
externality	Legal consequences caused by external legal environment and its changes (Yue, 2012).
internality	Legal consequences caused by employee's violation of legal provisions

Source: Prepared by the author (2022)

In the business activities of enterprises, the legal risks have the following characteristics brought by external factors or internal factors (Yan, 2019). as shown in Table 2.

Table 2. Characteristics of Enterprises Legal Risks

characteristic	Expressions
legality	The rules and regulations of the enterprise are derived from relevant legal provisions
coerciveness	The enterprise undertakes corresponding legal responsibility, the consequence is inevitable
universality	Carry out the whole process of enterprise life
relevance	All kinds of enterprise risks are mutual transformation and crossover
foreseeability	The consequences of enterprise risk are predictable
cognitive	Enterprise risk can be predicted or changed
professional	By the expertise of the law to solve
damage	Cause different degree of loss to the enterprise
no- insure	Enterprise legal risks cannot be transferred or disappeared through insurance

Source: Prepared by the author (2022)

As can be seen from the above table, this paper has different understandings of enterprise risk from different angles of risk identification. Therefore, up to now, there is no fair understanding of enterprise risk characteristics. The characteristics of enterprise risk in this paper can be roughly summarized as follows:

(1) Enterprise risk is dualistic, and enterprise risk should be measured by the size of loss occurrence and the probability of loss occurrence.

(2) Enterprise risk characterized by uncertainty, this uncertainty tends to judge the result of the expected performance uncertainty, the risk of outbreaks is often lead to a result of various factors, namely: because of a fruit more, due to the different risk factors is different for inducing risk happened in different environment, the effect of the uncertainty of factors can lead to the uncertainty of risk. The adoption of corporate risk monitoring has given rise to uncertainties regarding, among other things, the scheduling and staff investigations, the responsiveness to market risk data, and the repercussions for the consultants' professional futures (Knechel, 2007).

(3) Enterprise risk factors are hidden to a certain extent. The fact that the risk elements are in either a potential or observable condition, but are objectively concealed because people are used to it and choose to ignore it, best illustrates the hidden nature of enterprise risk. Conditions must be met before the risk can materialize. A combination of human and non-human actors, such as the tools developed to facilitate risk management operations, produce uncertainty, while they are not solely social in nature. Actors often base their actions on the threats that are communicated, but this reality does not exist irrespective of how it would be perceived (Michel., Lascoumes and Barthe, 2011).

(4)Enterprise risk has the accusability of legal liability. According to the above characteristics of enterprise risk, the author tries to define enterprise risk. First of all, risk refers to a specific event caused by a certain damage result caused by various uncertain factors in a certain condition and period. According to this, enterprise risk refers to the specific event that causes the enterprise to suffer losses due to the occurrence of certain damage results caused by various uncertain factors.

As mentioned above, the duality of enterprise risk is represented by risk occurrence probability and risk loss. Once the enterprise risk occurs, it is necessary to verify the risk loss first, and at the same time to conduct forensic analysis on the causes of the risk results. According to the size of the loss and the causal relationship between the risk factors, determine the enterprise as a legal subject should bear civil legal liability or administrative legal liability, or even criminal legal liability. While the enterprise undertakes the legal responsibility, the relevant responsible person of the enterprise shall also undertake the corresponding administrative or legal responsibility. Enterprises, as business subjects, objectively have many risks in their business behaviors. They can be divided into different categories according to the formation reasons and identification methods of enterprise risks. However, most of the risks in enterprises need to be solved through legal channels, and the methods and means of enterprise risk prevention must be carried out under the regulation of law. Therefore, many risks of enterprises can be boiled down to legal risks. Risk assessment in itself has led to a plethora of complexities, including uncertainties referring to the legal forms of risk business solutions, especially the question according to which pieces of evidence are regarded legally valid, uncertainties pertaining to the interpretation and proper implementation of risk management and uncertainties corresponding to the appropriate resources for enhancing risk management (Vinnari and Skærbæk, 2014).

MATERIAL AND METHODOLOGY

The evaluation model is based on AHP analysis. The AHP approach has been used by many researchers to analyze risks. In their works to evaluate uncertainty and risk, assessing shortfalls in supply chain system, identifying, categorising, and evaluating risk in civil engineering, inbound risk analysis, qualitative modelling of the safety of coastal ecosystems (Saaty, 1987; Saaty, 2008; Bochao, 2020;Mustafa and Al-Bahar, 1991;Wu, Blackhurst and Chidambaram, 2006; , Sii, Ruxton Wang, 2001; Shen and Liao, 2022). According to the existing research literature, many scholars regard the study of enterprise legal evaluation as a

complex economic behavior, or completely as a legal business, rather than a specific management system. Some scholars also study the legal evaluation process of enterprises from the perspective of business management, but there are great differences in the selection of risk points and evaluation measures of enterprises. Demand, supply, operational, legal, knowledge flow, financial, and environmental risk aspects have indeed been enumerated and assessed with in context of an organization to manage the risk effectively (Qianlei, 2012). Among them, some research documents did not start from the actual operation of enterprises, or did not analyze the specific elements of various legal problems in detail. Therefore, the research of relevant peers lacks practicality and adaptability.

(1) Thinking of evaluation

To make an objective and correct evaluation of enterprise legal risks, this study must solve the following problems once and for all:

1) The general evaluation objective of enterprise legal risk needs to be divided into several levels to create the hierarchical structure of the evaluation system and enable direct assessment of the final deconstructed evaluation elements through questionnaires, (Vinnari and Skærbæk, 2014).

2) In order to ensure the transitivity, attribute consistency and function dependence of elements at various levels in the hierarchical structure, it is necessary to test the hierarchical structure established by using decomposition method and establish the hierarchical model.

3) Since the evaluation characteristics of enterprise legal risk are suitable for fuzzy comprehensive evaluation method, the weight coefficients of each evaluation item must be determined when evaluating the evaluation items obtained by using decomposition method. The weight coefficient of evaluation item can be determined by using the judgment matrix construction and inspection method in AHP method. When it's crucial to take into account both quantitative and qualitative aspects of a solution, the Analytic Hierarchy Process (AHP) is a powerful and adaptable judgement method that enables people to create goals and get to the best decision. AHP is thought to be a better decision-making strategy than ANP due to its extensive use and applicability (Luthra, et al, 2020). The AHP methodology is a linear evaluation sort of model, in contrast to an analytic network process (ANP), that needs the development of numerous pair-wise test data generation, which might be challenging from the perspective of a quasi-participant (Qianlei, 2012). Multi-criteria decision-making (MCDM) issues have

traditionally been solved using the analytical hierarchy process (AHP). The fuzzy data sets, on the other hand, has demonstrated tremendous capability in describing ambiguity and improving decision-making quality under uncertainty. The foundation and benefits of interdisciplinary integration, like as Fuzzy AHP, are well enough in the literature. But it's still unknown under what circumstances these integrations will undoubtedly outperform AHP there in MCDM procedure (Chen, et al, 2022).

4) An acceptable questionnaire must be created to identify the proper target population in order to assure the evaluation's objectivity and effectiveness.

(2) Hierarchical decomposition of evaluation

The correct evaluation design of enterprise legal risk includes three aspects: division of labor and task unit design of legal risk, and determine the functional structure of coordination among task units; it covers the correlation mechanism between enterprise legal risk and external environment and between enterprise legal risk and internal environment. Through the configuration of decision right and residual claim weigh, the management mechanism of enterprise legal risk is established and realized (Quan and Yixing, 2020).According to the views of general system theory, a system should not only keepits rationality in the higher system as the constituent elements, which is compatible with other elements of higher system, but also keep the rationality of its structure, which is named the rationality of the system elements and relationship among system elementsto play its effectiveness in system goal (Voronina and Steksova, 2020).From the perspective of the evaluation system of enterprise legal risk, enterprise legal risk is a subsystem of enterprise management system, and its effectiveness should be matched with other influencing factors. Such matching is due to the adaptation of the subsystem (enterprise legal risk) to the associated background formed by other management subsystem elements. This adaptation is reflected in the rationality as a component element of the legal risk subsystem of enterprises management (Bo, 2009).

Therefore, the premise of the effectiveness of enterprise legal risk assessment is reflected in the following six aspects:

1) The adaptability of the subsystem (enterprise legal risk) to adapt to the background of the overall enterprise management system;

2) the adaptability of the mechanism of enterprise legal risk to the background of the overall enterprise management system;

3) the adaptability of the control mechanism of the enterprise legal risk to the background of the overall enterprise management system;

4) The matching between the subsystem of enterprise legal risk and other subsystem of enterprise management (Match 1);

5) The matching between the control mechanism of enterprise legal risk and other subsystem of enterprise management (Match 2);

6) The matching between the subsystem (enterprise legal risk) and the control mechanism of the enterprise (Match 3).

From the effectiveness of the results, the factors, which bring the enterprise legal risk, match the overall system of the enterprise management. At the same time, these factors should reflect certain management state of the enterprise. This state as a result of the effectiveness of the enterprise legal risk is one of the important reasons to realize the effectiveness of the overall system of enterprise management (Li, 2013).

The overall objective of evaluation of enterprise legal risk is decomposed step by stepin this paper.

P=the effectiveness of enterprise management system

B_1= the adaptability of factors bringing legal risks to the enterprises;B_2= Matching generation factors of enterprise legal risk

Q_1=Adaptability of thesubsystem of enterprise legal risk;Q_2= Adaptability of the generation mechanism of enterprise legal risk; Q_3=Adaptability of the control mechanism of enterprise legal risk; Q_4= Matching between legal risk subsystem and other management subsystem; Q_5= matching between legal risk element and legal risk control; Q_6= Matching between control force and the avoidance mechanism of legal risk:

Q_{11}= Rationality of legal risk control; Q_{12}= Rationality of internal coordination of legal risks; Q_{13}= Rationality of coordination among legal risksThe reasonable coordination between legal risk and other affair ； Q_{14}= Rationality of coordination among multiple legal risks;

Q_{21}=Rationality of enterprise management scope; Q_{22}=Openness of enterprise management; Q_{23}=Normal correlation among legal risks; Q_{24}=Abnormal correlation among legal risks; Q_{25}=Normal correlation of legal risk factors; Q_{26}= Abnormal correlation of legal risk factors;

Q_{31}=Rationality of legal risk control; Q_{32}=Rationality of the control costsof legal risks; Q_{33}= Rationality of other costs of legal risk control; Q_{34}= Universality of control costs of legal risk; Q_{35}= Adaptability of legal risk control;

Q_{41}= Matching between external environment and legal risk; Q_{42}= Matching between internal environment and legal risk; Q_{43}=Matching between risk factor and legal risk; Q_{44}= Matching among multiple factors and multiple legal risks;

Q_{51}= Matching between control force and legal risk; Q_{52}=Matching between control force and external factors; Q_{53}= Matching between control force and internal factors; Q_{54}= Matching between single factor and legal risk control; Q_{55}=Matching between single external factor and legal risk control; Q_{56}= Matching between single internal factors and legal risk control; Q_{57}=Matching between multiple factors and legal risk control;Q_{58}= Matching between various external factors and legal risk control; Q_{59}=Matching between various internal factors and legal risk control;

Q_{61}= Matching between control force and risk avoidance; Q_{62}=Matching between control force and single external measureof risk avoidance; Q_{63} = Matching between control force and single internal measure of risk avoidance;Q_{64}=Matching between various measures and risk avoidance; Q_{65} = Matching relationships among external avoidance measures; Q_{66}= Matching between single and multiple internal measures; Q_{67}=Matching between enterprise management and legal risk control; Q_{68}=Matching between enterprise management and external control force of legal risk; Q_{69}= Matching between enterprise management and internal control of legal risk.

(3) Establishing model

This paper divides the artificial elements of the enterprise legal risk evaluation index system in order to analyze the realization mechanism of the effectiveness of enterprise risk evaluation (Mustafa and Al-Bahar, 1991). The results of the division are then compared to the requirements of transitivity, attribute consistency, and functional dependence of elements at all levels of the hierarchical and sub-structure in the application of AHP. It is a necessary processing and inspection, which must be carried out in accordance with the establishment method of hierarchical structural model by ISM technology (Mengyuan, 2021) The hierarchical structure model is established based on the reachable matrix reflecting the binary reachable relation of system elements and taking matrix transformation as the main line, which is as follows:

1) Evaluation Matrix

For the effectiveness of the evaluation index system of enterprise legal risk (Yin, Liu and Han, 2022). This paper sets X as composed of 46 elements (X_1, X_2,... , X_{46}), where:

$X_1=P$, $X_2=B_1$, $X_3=B_2$, $X_4=Q_1$, $X_5=Q_2$, $X_6=Q_3$, $X_7=Q_4$, $X_8=Q_5$, $X_9=Q_6$, $X_{10}=Q_{11}$, $X_{12}=Q_{13}$, $X_{13}=Q_{14}$, $X_{14}=Q_{21}$, $X_{15}=Q_{22}$, $X_{16}=Q_{23}$, $X_{17}=Q_{24}$, $X_{18}=Q_{25}$, $X_{19}=Q_{26}$, $X_{20}=Q_{31}$, $X_{21}=Q_{32}$, $X_{22}=Q_{33}$, $X_{23}=Q_{34}$, $X_{24}=Q_{35}$, $X_{25}=Q_{41}$, $X_{26}=Q_{42}$, $X_{27}=Q_{43}$, $X_{28}=Q_{44}$, $X_{29}=Q_{51}$, $X_{30}=Q_{52}$, $X_{31}=Q_{53}$, $X_{32}=Q_{54}$, $X_{33}=Q_{55}$, $X_{34}=Q_{56}$, $X_{35}=Q_{57}$, $X_{36}=Q_{58}$, $X_{37}=Q_{59}$, $X_{38}=Q_{61}$, $X_{39}=Q_{62}$, $X_{40}=Q_{63}$, $X_{41}=Q_{64}$, $X_{42}=Q_{65}$, $X_{43}=Q_{66}$, $X_{44}=Q_{67}$, $X_{45}=Q_{68}$, $X_{46}=Q_{69}$

The set of element pairs from $X_1 \sim X_{46}$ directly related to:

$R_b=\{(X_2, X_1),(X_3, X_1),(X_4, X_2),(X_5, X_2),(X_6, X_2),(X_7, X_3),(X_8, X_3),(X_9, X_3),(X_{10}, X_4),(X_{11}, X_4),(X_{12}, X_4),(X_{13}, X_4),(X_{14}, X_5),(X_{15}, X_5),(X_{16}, X_5),(X_{17}, X_5),(X_{18}, X_5),(X_{19}, X_5),(X_{20}, X_6),(X_{21}, X_6),(X_{22}, X_6),(X_{23}, X_6),(X_{24}, X_6),(X_{25}, X_7),(X_{26}, X_7),(X_{27}, X_7),(X_{28}, X_7),(X_{29}, X_8),(X_{30}, X_8),(X_{31}, X_8),(X_{32}, X_8),(X_{33}, X_8),(X_{34}, X_8),(X_{35}, X_8),(X_{36}, X_8),(X_{37}, X_8),(X_{38}, X_8),(X_{39}, X_9),(X_{40}, X_9),(X_{41}, X_9),(X_{42}, X_9),(X_{43}, X_9),(X_{44}, X_9),(X_{45}, X_9),(X_{46}, X_9)\}$

On the basis of the above, this paper establishes the adjacency matrix for the evaluation system of enterprise legal risk.

Divide X into mutually independent regions with respect to a given binary with respect to R, and first give the list of reachable sets, antecedent sets, common sets and initial sets of X_i. The reachable set of system element X_i is the set composed of all elements reachable by X_i in the reachable matrix, denoted as $R(X_i)$, and its definition:

$R(X_i)=\{X_j \mid X_j \in X, m_{ij}=1, j=1,2,\ldots,n\}$, $i=1, 2,\ldots,n$

The antecedent set of system element X_i is the set composed of all elements reachable by X_i in the reachable matrix, denoted as $P(X_i)$, and its definition:

$P(X_i)=\{X_j \mid X_j \in X, M_{ji}=1, j=1,2,\ldots,n\}$, $i=1,2, \ldots,n$

The common set of system element X_i is the common part of X_i in the reachable set and antecedent set, denoted as Q (X_i), and its definition:

$Q(X_i)=\{X_j| X_j \in X, M_{ji}=1, M_{ji}=1, j=1,2,\ldots,n\}$, i=1,2, …,n

The origination set of system element set X is a set composed of elements in X that only affect other elements, but they are not affected (not reached by other elements), denoted as B (X), and its definition:.

$B(X)=\{X_j| X_j \in X, Q(X_i) =P(X_i),i=1,2,\ldots,n\}$

2)Determine the hierarchical position of each element

The origination set of system element set X is B (X).

$B(X)=\{X_{10}, X_{11}, X_{12}, X_{13}, X_{14}, X_{15}, X_{16}, X_{17}, X_{18}, X_{19}, X_{20}, X_{21}, X_{22}, X_{23}, X_{24}, X_{25}, X_{26}, X_{27}, X_{28}, X_{29}, X_{30}, X_{31}, X_{32}, X_{33}, X_{34}, X_{35}, X_{36}, X_{37}, X_{38}, X_{39}, X_{40}, X_{41}, X_{42}, X_{43}, X_{44}, X_{45}, X_{46}\}$

On the contrary to the originationset, the set composed of the output elements of the system, E (X).

$E(X)=\{X_j| X_j \in X, Q(X_j) =R(X_j), i=1,2,\ldots,n\} =\{1\}$

In B(X), any two elements b_u、b_v, $R(b_u)\cap R(b_v)\neq\Phi$, and in B(X), this result is for all u and v, so that the set of system elements studied in this paper is not separable in X.

For the system element set X, if L_1, L_2,... , L_1 represents the set of elements at all levels from high to low (where 1 is the largest level digit), then the result of level classification can be written as follows:

$\Pi(X)=L_1, L_2;\ldots, L_1$

If $L_0=\Phi$,

$L_1=\{X_j| X_j \in X-L_0, Q_0(X_j) =R_0(X_j), i=1,2, \ldots, n\}$

L_2= {X_j| X_j ∈X-L_0-L_1, $Q_1(X_j)$ =$R_1(X_j)$, i<n}

……

L_k= {X_j| X_j ∈X-L_0-L_1-…-L_{k-1}, $Q_{k-1}(X_1)$ =$R_{k-1}(X_j)$, i<n}

The classification results of elements in the evaluation index system of enterprise legal risk are as follows:

L_1= {X_1} , L_2= {X_2,X_3} , L_3= {X_4,X_5,X_6,X_7,X_8,X_9} , L_4= {X_{10} , X_{11}, X_{12}, X_{13}, X_{16}, X_{17}, X_{18}, X_{19}, X_{20}, X_{21}, X_{22}, X_{23}, X_{24}, X_{25}, X_{29}, X_{30}, X_{31}, X_{32}, X_{33}, X_{34}, X_{34}, X_{36}, X_{37}, X_{38}, X_{39}, X_{40}, X_{41}, X_{42}, X_{43}, X_{44}, X_{45}, X_{46} }

Factor set Q is the set of evaluation index.

Q= {Q_{ij}} = {Q_{11}, Q_{12}, Q_{13}, Q_{14}, Q_{21}, Q_{22}, Q_{23}, Q_{24}, Q_{25}, Q_{26}, Q_{31}, Q_{32}, Q_{33}, Q_{34}, Q_{35}, Q_{41}, Q_{42}, Q_{43}, Q_{44},Q_{51}, Q_{52}, Q_{53}, Q_{54}, Q_{55}, Q_{56}, Q_{57}, Q_{58}, Q_{59}, Q_{61}, Q_{62}, Q_{63}, Q_{64}, Q_{65}, Q_{66}, Q_{67}, Q_{68}, Q_{69}}

3) weight measure

In the evaluation system of enterprise management effectiveness, this paper sets the research weight coefficient as:

W_F=0.0024,0.0074,0.0242,0.0129,0.0085,0.0031,0.0023,0.0010,0.0011,0.0043,0.1086,0.0157,0.0361,0.0073,0.0150,0.0066,0.0630,0.0630,0.0174,0.0441,0.0441,0.0189,0.1130,0.1130,0.0671,0.0203,0.0099,0.0176,0.0278,0.0474,0.0072,0.0122,0.0209,0.0029,0.0071,0.0071}

4)Steps of evaluation

Steps for building the evaluation model of enterprise legal risk:

In the first step, after experts score the factors producing legal risks, the evaluation vector V_i= {v_{i1}, v_{i2},... ,v_{i5}}, where, v_{ij} is the percentage of the number of people who give jthe grade of the jth when the experts evaluate the ith factor.

The second step is to establish a single factor evaluation model:$Y_i=V_i \cdot E^T$。

The third step is to establish the final evaluation model of enterprise legal risk:

$P=W_F \cdot Y$

Where, $Y=\{Y_1, Y_2, \ldots, Y_{36}\}^T$

This paper provides a more specific basis for the optimization model of legal risk evaluation, and the comprehensive evaluation score of Q_i can be calculated at the same time, i=1,2, …, 6. P_{Qi}represents the comprehensive evaluation value of Q_i,

$W_{Mi}$is the weight vector of Q_{ij} , $W_{Mi}=\{W_{Q11}, W_{Q12}, \ldots, W_{Qij}\}$. When i=1, j=4, and when i =2, j=6, and when i=3, j=5, and when i=4, j=4, and when i=5, j=9; and when i =6, j=9. Y_{Qi} is the evaluation result vector. Then, the comprehensive evaluation score of Q_i is:

$P_{Qi}=W_{Mi} \cdot Y_{Qi}^T$

The evaluation set is the set of evaluation grades. In this paper, the evaluation set of enterprise legal risk is set as:

$E=\{e_1, e_2, e_3, e_4, e_5\}$ = {very good, preferably, general,range, very bad}.

The corresponding score of evaluation set elements is: very good =100, preferably =85, general =70, range=55, very bad=40.

RESULTS AND DISCUSSION

This study establishes the enterprise legal risk evaluation model and a set of evaluation systems in accordance with the concepts and goals of enterprise legal risk evaluation. This study uses enterprise contract management as a legal risk assessment case to demonstrate the adaptability of pertinent assessment systems.

(1)The target layer design of contract risk assessment; The management of contract risk directly affects whether the system is flawless or not. Due to the significance of contract management in enterprises, it is crucial that enterprises boost the development and improvement of their contract management system. As was previously stated, the enterprise should consider how to achieve the goal of effective management when designing and controlling the construction contract management system. The enterprise should be the key control points for the contract risk during the system construction process, combining this with the feature of the enterprise itself, through the enterprise

contract management basic system, concrete system, and specialized file three levels of specification.

(2) The content and scope of enterprise contract risk assessment; Project about enterprise contract, authorize, business negotiation, text writing, contract, to perform the related process of program specification, shall, in the customer credit investigation, credit evaluation, contract review, authorized management, contract approval, censorship, print, contract statistics, file management, contract filing, contract management, contract management, inspection system contract. The management processes such as post responsibility system, contract countersigning, reward and punishment system should also include contract audit, contract project responsibility system and contract process control, and establish relevant risk assessment systems. The idea of contractual managing that is put out is implemented on the basis of contributions that a contract may make to the administration of an organization, an enterprise unit, and a transaction. It takes into account the procedures that risk management, knowledge management and financial management as pertinent in this area. Contractual management improves efficiency from a regulatory and legal standpoint. It allows better adherence with contractual responsibilities and standards for sound corporate management, as well as improving the quality of the contract (Schuhmann and Eichhorn, 2015).

(3) Hierarchical design of enterprise contract risk assessment system; normal circumstances, enterprises should develop a method of appropriate contract risk management according to their own nature and characteristics, and form the contract risk management method into an evaluation process. The risk premium resulting from the lack of accountability in the credit evaluations is the main reason for the high financing rates and financing costs in the current trade and supply chain financing operations (Li, 2020).The evaluation process consists of three levels: basic system, special system and specialized document, and finally forms a relatively complete evaluation system. At the same time, contract management departments at all levels of enterprises can also formulate specific evaluation procedures under certain conditions, characteristics and existing problems of their subordinate units. This includes for instance organizing an order, choosing a customer, investigating and approving credit, authorizing, preparing bid documents, writing and signing contracts, etc.

CONCLUSION

This paper first analyzes the multiple causes of enterprise legal risks, and respectively defines their characteristics according to the sources of factors causing enterprise legal risks, and scientific classification of enterprise legal risks. External legal risks are those that result from the social environment, legal environment, policy environment, and other external aspects. Internal legal risks are those that result from internal management, business behavior, and company decisions. After accurately defining the enterprise legal risk, this paper studies the evaluation ideas and evaluation objectives according to the factors of enterprise legal risk and optimization problems, and establishes the evaluation model of enterprise legal risk to evolve an evaluation system of enterprise legal risk mitigation. The goal of this research paper is to build evaluation system to improve enterprises and enhance various systems, as well as to encourage enterprises to act quickly to reduce risk-related losses and save operational expenses so that enterprises can advance steadily in the economic environment that are rife with crises. In this way, the management measures of enterprises legal risk can be scientific, systematic and practical through this method to play a greater role in practical arena of enterprise. This study also has some shortcomings or limitations mainly because of the different types of enterprises and the difficulty of data analysis. In the future work, the research content will be more detailed to solve more micro problems of enterprise legal risks, which are the suggestions for future work.

REFERENCES

Bo, D. (2009). Discussion on the management performance evaluation index system of commercial banks. *Technology and Market*, (7):54-60.

Bo, L. (2014). *Research on Risk Management and Control of Large Metallurgical Enterprises*.Doctoral thesis, Tianjin University.

Bochao, L. (2010, October). Supply chain risk assessment based on AHP and fuzzy comprehensive evaluation. In *2010 International Conference on Management of e-Commerce and e-Government* (pp. 317-322). IEEE.

Chen, X., Fang, Y., Chai, J., & Xu, Z. (2022). Does intuitionistic fuzzy analytic hierarchy process work better than analytic hierarchy process?. *International Journal of Fuzzy Systems*, 24(2), 909-924.

Guiyou, Z.,& Yue, Z. (2011). *China Science and Technology Information*, (23):88-90.

Husam, H. M. J. A. (2023). The Effect of Leadership Styles on Creative Behavior: the Mediating Role of Succession an Applied Study in Jordanian Medium and Small Companies. *International journal of Professional Business Review*, 8(2), e01066-e01066.

Jian, Y. (2012).How to Strengthen the Prevention of Enterprise legal risk. *Jiangsu Salt Science and Technology*, (1):106-120.

Jing, Z. (2008). Tang Ming. Legal Risk Prevention and How Enterprises Face It. *Chinese and foreign enterprise culture*, (5):67-70.

Karpoff, J. M., Lott, Jr, J. R., & Wehrly, E. W. (2005). The reputational penalties for environmental violations: Empirical evidence. *The Journal of Law and Economics*, 48(2), 653-675.

Khan, S., & Kothari, S. (2020). Dissertation of Startup Finance and Risk Controls. *Global Journal of Management And Business Research*.

Knechel, W. R. (2007). The business risk audit: Origins, obstacles and opportunities. *Accounting, Organizations and Society*, 32(4-5), 383-408.

Li, J., Zhu, S., Zhang, W., & Yu, L. (2020). Blockchain-driven supply chain finance solution for small and medium enterprises. *Frontiers of Engineering Management*, 7(4), 500-511.

Li. (2013). Research on evaluation Index System of enterprise green management. *Technology and Market*, (5):18-22.

Luthra, S., & Mangla, S. K. (2018). Evaluating challenges to Industry 4.0 initiatives for supply chain sustainability in emerging economies. *Process Safety and Environmental Protection*, 117, 168-179.

Luthra, S., Kumar, A., Zavadskas, E. K., Mangla, S. K., & Garza-Reyes, J. A. (2020). Industry 4.0 as an enabler of sustainability diffusion in supply chain: an analysis of influential strength of drivers in an emerging economy. *International Journal of Production Research*, 58(5), 1505-1521.

Mengyuan,C.(2021). Discussion on internal control management and legal risk prevention and control of State-owned Enterprises under the new situation. *Public Investment Guide*, (1):62-68.

Michel., C, Lascoumes, P and Barthe,Y (2011). *Acting in an uncertain world: An essay on technical democracy*. MIT press.

Mustafa, M. A., & Al-Bahar, J. F. (1991). Project risk assessment using the analytic hierarchy process. *IEEE transactions on engineering management*, 38(1), 46-52.

Mustafa, M. A., & Al-Bahar, J. F. (1991). Project risk assessment using the analytic hierarchy process. *IEEE transactions on engineering management*, 38(1), 46-52.

Qianlei, L. (2012, October). The study on the risk management of agricultural products green supply chain based on systematic analysis. In *2012 Second international conference on business computing and global informatization* (pp. 250-253). IEEE.

Qianlei, L. (2012, October). The study on the risk management of agricultural products green supply chain based on systematic analysis. In *2012 Second international conference on business computing and global informatization* (pp. 250-253). IEEE.

Quan, C & Yixing, G. (2020). Safety management of metallurgical enterprises based on risk management principle. *Value engineering*, 39(30):39-41.

Saaty, T. L. (1987). Risk—its priority and probability: the analytic hierarchy process. *Risk Analysis*, 7(2), 159-172.

Saaty, T. L. (2008). The analytic hierarchy and analytic network measurement processes: applications to decisions under risk. *European journal of pure and applied mathematics*, 1(1), 122-196.

Schuhmann, R., & Eichhorn, B. (2015). From contract Management to contractual Management. *European Review of Contract Law*, 11(1), 1-21.

Shen, Y., & Liao, K. (2022). An Application of Analytic Hierarchy Process and Entropy Weight Method in Food Cold Chain Risk Evaluation Model. *Frontiers in Psychology*, 13, 825696-825696.

Sii, H. S., Ruxton, T., & Wang, J. (2001). A fuzzy-logic-based approach to qualitative safety modelling for marine systems. *Reliability Engineering & System Safety*, 73(1), 19-34.

Suhartono S., Sulastiningsih, S., Chasanah, U., Widiastuti, N., & Purwanto, W. (2023). The Relationship of Leadership, Discipline, Satisfaction, and Performance: A Case Study of Steel Manufacture in Indonesia. *International journal of Professional Business Review*, 8(2), e01146-e01146.

Vinnari, E., & Skærbæk, P. (2014). The uncertainties of risk management: A field study on risk management internal audit practices in a Finnish municipality. *Accounting, Auditing & Accountability Journal*.

Vinnari, E., & Skærbæk, P. (2014). The uncertainties of risk management: A field study on risk management internal audit practices in a Finnish municipality. *Accounting, Auditing & Accountability Journal*.

Voronina, N. V., & Steksova, S. Y. (2020, August). Project finance risk management at the stages of the housing projects' life cycle. In *IOP Conference Series: Materials Science and Engineering* (Vol. 913, No. 5, p. 052002). IOP Publishing.

Wu, D. D., Chen, S. H., & Olson, D. L. (2014). Business intelligence in risk management: Some recent progresses. *Information Sciences*, 256, 1-7.

Wu, T., Blackhurst, J., & Chidambaram, V. (2006). A model for inbound supply risk analysis. *Computers in industry*, 57(4), 350-365.

Yan, L. (2019). Corporate financing risks and Countermeasures. *Accounting Learning*,2019(17):20-28.

Yan, W., & Song, Y. (2022). Intelligent Evaluation and Early Warning of Liquidity Risk of Commercial Banks Based on RNN. *Computational Intelligence and Neuroscience*, 2022.

Yin, S., Liu, J., & Han, Z. (2022). Relationship between urban morphology and land surface temperature—*A case study of Nanjing City. PloS one*, 17(2), e0260205.

Yiu, L. D., Yeung, A. C., & Cheng, T. E. (2021). The impact of business intelligence systems on profitability and risks of firms. *International Journal of Production Research*, 59(13), 3951-3974.

Yue, Y. (2012).Research on the Problems and Countermeasures of Smes' Legal Risk Prevention. *Application of Law*. (4):16-21.

Zhao, W. (2016). Financial development and regional innovation output growth: Based on empirical analysis of provincial panel data in China. *Modern Economy*, 7(01), 10.